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MANIPAL

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MEDICAL JOURNAL

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SHARING KNOWLEDGE, EMPOWERING CARE.

A QUARTERLY PUBLICATION OF  
MANIPAL HOSPITAL DWARKA, NEW DELHI

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# FROM THE EDITOR-IN-CHIEF'S DESK



It is with utmost pride & satisfaction that we present our first issue of Manipal Medical Journal (MMJ). Like a mother for whom her first born is always so special! The apprehensions, pain and above all the excitement is just like the first delivery and we are all so happy that we could meet our delivery date! It is all the more special because it has come at a time when the world is going through a pandemic. As healthcare workers are at the frontline we have learnt to work in the new normal guidelines.

Ever since I was given the task of building the Department of Academics & Research, the thought of having our very own journal was uppermost in my mind. I am very thankful to the Core Academics Group for supporting me with valuable suggestions and a number of Zoom meetings! This journal is the first of a regular quarterly offering from the brilliant academic minds at Manipal Hospital, New Delhi.

I am extremely thankful to our Advisors, Mr Pramod Alagharu, CEO MHD, for encouraging us in all our endeavours and Mr Raman Bhaskar, Hospital Director who has always been so positive when it comes to any troubleshooting & finding solutions. Dr Yugal K Mishra, Chief of Clinical Services & Patron of the journal, for his constructive & valuable inputs to enrich the contents of the journal. Dr (Lt Gen) C S Narayanan, HOD Neurology and Patron of the journal, for super solutions and for guiding us all the way.

Special thanks to MMJ Editorial Board representing each & every speciality of this hospital and who have come forward enthusiastically to share articles/ cases which have added to the value of the journal.

Our extremely knowledgeable, active & supportive Editor Dr Vikas Taneja who has reviewed & edited all the articles & who has been through this delightful journey right from the beginning. Thanks Dr Vikas for everything! It would not have been possible without you!

My Associate Editor Dr Kunal Das, whose independent thinking, affable personality & cool temperament helped in building the journal material.

Thanks to Dr Prashant Vashistha for being just a phone call away for any clarifications! Thanks for the positive communications throughout this new journey.

Last but not the least Dr Sakshi K Bhardwaj, our Academic Coordinator who kept us coordinated and connected through emails and after-OPD-hour's discussions!

Finally a big thank you to our creative team headed by Mr Abhishek Mishra, for the safe delivery of our first baby!

Sharing Knowledge, Empowering Care!

A handwritten signature in blue ink, appearing to read 'Leena N Sreedhar'.

Dr (Lt Col) Leena N Sreedhar  
Editor-in-Chief MMJ

# MESSAGE FROM THE CHAIRMAN

Sharing knowledge, empowering care.



I am very glad to note that the first edition of the Manipal Medical Journal of Dwarka will be released shortly.

Congratulations and all the very best on your endeavour to bring out this peer-reviewed journal, which will showcase the extraordinary clinical work and experience of our eminent consultants.

In addition to the wonderful clinical work being done, I am glad we are also involved in this kind of academic work.

Congratulations once again to Team Manipal Hospitals Dwarka on this achievement.

A handwritten signature in black ink, which appears to read "Dr. Sudarshan Ballal". The signature is fluid and cursive.

Dr Sudarshan Ballal  
Chairman, MHEPL

## MESSAGE FROM OUR MD & CEO



**K**nowledge is one such investment that grows by leaps and bounds when shared. We learn from yesterday, practice it today, innovate tomorrow and we keep growing throughout that process. That is the very intention behind this unique initiative. In this quarterly journal, some of our senior colleagues would share their experiences and new learnings for the benefit of their peers.

What we have gone through in the last 4 months has certainly tested our mettle and perhaps even shaken us. It has kept us on our toes. But healthcare professionals from across the globe have come together to put up a strong fight. And in times like these, the only way to bring normalcy back to the world is through shared knowledge.

In the pages that follow are notable findings and anecdotal references of some of the most critical and clinically challenging cases across specialties. Also curated in the journal are a few important contributions related to common and topical problems from a varied clinical spectrum, especially those relevant to developing countries.

Today, I take pride in launching this peer-reviewed journal and I am sure it would serve as a guide for clinicians not only in our network of hospitals, but from all over. I would also like to congratulate the team that conceived and executed the idea of this Journal.

Here is to Sharing knowledge, empowering care.

Yours Sincerely,  
**Dilip Jose,**  
MD & CEO, Manipal Hospitals

# MESSAGE FROM THE COO

## Hello Clinicians and Team MHD



It is very heartening to witness the release of MMJ the official Medical Journal of Manipal Hospital, Dwarka (MHD). MMJ will feature exceptional work done by the clinical team of MHD and will also offer deep insights into some of the most common health issues that ails the subcontinent and the South Asian population.

No other profession has the ability to amaze and inspire people as much as medicine does. When hopes are lost, when the chips are down and when intense melancholy sets in, it is only the medical fraternity that has the capacity to completely reverse trends and bring back normalcy in people's lives.

I am sure MMJD will be another feather in MHD's cap. Though a relatively new institution, MHD has reflected a maturity far beyond the years it has been in existence. That's because of the tremendous work that happens in there and the effort by all of you to keep the needle constantly moving and setting newer benchmarks.

MMJ will be a journal of excellence to reckon with, which will benefit clinicians who seek higher order care for their patients, influence the medical student fraternity, aid research in common ailment areas and much more.

Indeed a momentous occasion. Indeed a proud moment. Indeed a winner in the making.

Good Luck and God Bless.

A handwritten signature in white ink that reads "K. Raja". The signature is stylized and written in a cursive-like font.

Karthik Rajagopal  
COO  
Manipal Hospitals

# MESSAGE FROM THE CHIEF OF CLINICAL SERVICES



**T**his is a happy occasion for all of us that Manipal Hospital, Dwarka is launching its own Medical Journal. At this juncture let me congratulate Dr Leena N Sreedhar, Dr Vikas Taneja and all the Editorial Board Members of the Journal for achieving this very important task.

I would also wish to thank Mr Pramod Alagharu and Mr Raman Bhaskar for their active support and encouragement to the Editorial team.

I am sure with the launch of our Journal we will all have a platform to publish our clinical work.

Wishing all a very successful launch of MANIPAL MEDICAL JOURNAL!

A handwritten signature in black ink, appearing to read "Yugal K Mishra".

**Dr Yugal K Mishra**

Chief of Clinical Services, Head of Cardiac Sciences and Chief Cardio Vascular Surgeon  
President: Society of Minimally Invasive Cardiovascular and Thoracic Surgeons of India  
Past President: Indian Association of Cardiovascular Thoracic Surgeons of India  
Council Member: Association of Thoracic and Cardiovascular Surgeons of Asia  
Ex Director: Board of International Society for Minimally Invasive Cardiothoracic Surgery,  
Beverly, MA USA

# MESSAGE FROM THE EDITOR



It has been a great honour & privilege to be the editor of our own Manipal Medical Journal (MMJ). To begin with, it seemed like a huge task but with the collaborative effort from all the departments, we are ready with the first issue of our journal. It has been the vision of our CEO Mr Pramod and I feel honoured to say that the Department of Academics & Research, under the leadership of Dr Leena N Sreedhar has really lived upto it. The focus of this journal is to highlight the best clinical & academic work being carried out across various departments, which we don't come to know in our day to day clinical work.

To start with, we envisaged to bring out quarterly publication with at most 5-6 articles per issue and that too mainly case reports. It's natural for any journal to start with whatever articles it gets, work on the quality and content of the articles and gradually move towards indexation. I am really proud to say that the quality and content of the articles received for the first issue has been extraordinary and we were able to compile almost 18 articles for the first issue.

For any journal to succeed, there has to be good clinical work which is published, academically oriented contributors, enthusiastic editorial board and innovative ways to make the journal enjoyable for the readers. I wish we are able to live up to the expectations from MMJ and bring out every issue with good quality content. We also hope to incorporate more innovative ideas so as to improve our quality & content with time.

We tried to accommodate as many articles as possible in the first issue, but I know many departments would have been left. I would request everyone to keep writing and sending articles highlighting your department and clinical work. This has to become a continuous process and more and more articles would be needed every quarter to maintain the standard we are trying to create for Manipal Medical Journal.

Our motto – “Sharing Knowledge, Empowering Care.”

A handwritten signature in blue ink that reads "Vikas Taneja". The signature is written in a cursive style and is positioned above a horizontal line.

Dr. Vikas Taneja  
Editor, Manipal Medical Journal



<b>SECTION</b>	<b>ARTICLES</b>	<b>PAGE NO.</b>
COMMENTARIES	<b>Inception of Minimally Invasive &amp; Robotic Cardiac Surgery Program at a Tertiary Level Hospital: Our Journey &amp; Strategies</b> - Yugal Kishore Mishra	1
SPECIAL ARTICLE	<b>Radiological Services In A Nutshell</b> - M L Bera	7
REVIEW ARTICLE	<b>Pathophysiology of Foetal to Neonatal Transition and Evidence based Delivery Room Management</b> - Vinay Kumar Rai	11
	<b>Stereotactic Body Radiotherapy (SBRT) – A New Paradigm in Radiation Oncology</b> - Anusheel Munshi, Khushboo Rastogi	15
CASE REPORT	<b>A Rare Presentation of Mediastinal Teratoma as a Massive Pleural Effusion on Chest Radiography.</b> - Davinder Kundra, Peush Bajpai, Sahil Bansal	17
	<b>Enteric Fever associated Mild Encephalopathy with Reversible Splenic Lesion (MERS) of Corpus Callosum: A case report in 4 years old child with excellent prognosis</b> - Pramod Kumar, Amit Valbhani, Obeid Shafi, Vikram Gagneja, Neeta Kejriwal, Himanshu Batra, Vikas Taneja	19
	<b>EUS guided Biliary Drainage and Duodenal Stenting in a case of Advanced Pancreatic Cancer with Review of Literature.</b> - Kunal Das, Pawan Kirtani, Girish Yadav	21
	<b>Sinus of Valsalva Aneurysm – 3D Trans Esophageal Echocardiography to the rescue.</b> - Naresh Kumar Aggarwal, Arun Subramanian, Yugal K Mishra	25
	<b>Anterior Superior Iliac Spine (ASIS) Avulsion Fracture in an Adult: A Case Report</b> - Sandeep Singhal, Gaurav Rastogi	27

<b>SECTION</b>	<b>ARTICLES</b>	<b>PAGE NO.</b>
CASE REPORT	<b>A Rare Case of Abdominoperineal Fistula Arising From Episiotomy Scar Presenting as a Non-Healing Sinus</b> - Yashica Gudesar, Abhishek Tiwari	30
	<b>Role of early anomaly NT scan &amp; Diagnosis of Acrania-exencephaly-anencephaly sequence</b> - Gaurav Malhotra	32
DIAGNOSTIC DILEMMAS	<b>Misdiagnosing Epilepsy: A Case Report on Stokes-Adams Syndrome</b> - Sushant Chhabra	34
	<b>Carcinoma Lung presenting as Perianal Abscess</b> - Vikas Kumar Pandey, Anusheel Munshi, Kanika Bansal, Khushboo Rastogi	38
VIEW POINTS	<b>Communicating Respectfully with the Oncology Patient</b> - Anusheel Munshi	40
IMAGE CORNER	<b>Blue Rubber Bleb Nevus Syndrome (BRBNS)</b> - Sufla Saxena	42
	<b>Radiation Colitis</b> - Kunal Das	
JOURNAL SCAN		44
RECENT ADVANCES		47

# Inception of Minimally Invasive & Robotic Cardiac Surgery Program at a Tertiary Level Hospital: Our Journey & Strategies

■ Yugal Kishore Mishra

Chief of Clinical Services, Head of Cardiac Sciences and Chief Cardio Vascular Surgeon, Manipal Hospital, Dwarka

## INTRODUCTION

Minimally invasive cardiac surgery (MICS) has undergone numerous changes in technique and philosophy and is the latest in the field of cardiac surgery along with interventional techniques and hybrid procedures. The origins of minimally invasive surgery date back to the 1950s. However in cardiac surgery, it was only in the mid-1990s that minimally invasive approach was utilized with Cosgrove describing the first minimally invasive valve surgery in 1996. The rise of interventional cardiology and new techniques like laparoscopy or thoracoscopy have necessitated the need to explore alternative approaches to median sternotomy. Some early mitral and aortic valve surgeries were performed with a right parasternal incision that necessitated resection of the third and fourth costal cartilages. While the procedures could be performed safely and effectively, this approach resulted in potential chest wall instability, difficult conversion to median sternotomy and required transecting the right internal mammary artery. Currently, the right mini-sternotomy in the fourth intercostal space is the incision of choice for minimally invasive mitral-valve surgery. **(Fig 1)** Minimally invasive aortic valve surgery is now most commonly performed via a limited skin incision, with a partial upper sternotomy that extends into the third or fourth intercostal space **(Fig 2)** or via right second intercostal space depending on the position of aorta and pulmonary bifurcation on NCCT chest. Left mini thoracotomy is preferred incision for minimally invasive coronary artery bypass surgery **(Fig 3)** and robotic cardiac surgery **(Fig 4,5)**.



Fig 2: Small Rt anterior Thoracotomy scar following minimally invasive AVR



Fig 3: Left anterior Thoracotomy scar following multi vessel coronary artery bypass grafting (MICAS)



Fig 1: Small Rt antero-lateral Thoracotomy scar following minimally invasive MVR



Fig 4: Our latest Da Vinci x1 Robotic System



Fig 5: Robotic IMA harvesting

Main advantages of minimally invasive surgery as in any other surgical fields include cosmetic and earlier recovery, as well as minimizing use of blood products and lower infection rates along with reduced hospital stay and earlier return to work as has been documented by many studies (**Box 1**). This is all the more important in cardiac surgery where the morbidity of a large sternal incision is too much as the patients are sicker with multiple co-morbidities and old age.

#### Advantages of Minimally Invasive Cardiac Surgery

1. Cosmetically better with smaller scar.
2. Avoidance of sternal complications.
3. Less use of Blood and Blood products.
4. Lesser post-operative ICU and Hospital Stay.
5. Earlier return to activity and faster post-operative recovery.
6. Less wound infection rate.
7. Psychologically better for the patient.
8. Especially useful in some Redo cases.

Box 1

On the other hand, a steep learning curve and technical difficulties in handling some steps (myocardial protection, de-airing maneuvers, and so on), reduced work space and limited vision discourage many surgeons (**Box 2**) to include these minimally invasive procedures within their routine practice. All this requires special training and have been the main reason why minimally invasive techniques have not been picked up widely at most centers despite of its advantages as listed above.

#### Why Minimally Invasive Surgery has not been very Popular

1. Steep learning curve.
2. Reduced working space.
3. Limited vision.
4. Need for special training.
5. Availability of specialized instruments and facilities.
6. Technical difficulties in handling some steps.

Box 2

In Germany, this applies to 92% of all and 98% of isolated bypass operations. We don't have any particular registry for the numbers of cardiac surgical procedures carried out annually or number of minimally invasive cardiac procedures carried out per year in our country but there is no reason to believe it will be any different. In fact it is likely to be lesser only than an advanced country like Germany. The use of sternotomy-free techniques currently seems center-specific or surgeon-specific, presumably because such procedures are of notably greater complexity as discussed above.

#### Examples where minimally invasive surgery is especially useful

1. Re-operations with prior wound infections (especially in the absence of a sternum).
2. Procedures in patients with morbid obesity, to prevent sternum instability and wound infections.
3. Procedures in patients with severely impaired lung function.
4. Procedures in patients with severe osteoporosis.
5. Procedures in patients with renal failure or severe diabetes mellitus.

Box 3

Trying to schedule a program for starting and teaching minimally invasive cardiac surgery and robotic cardiac surgery at a new center is a step forward and a challenge and requires a lot of thought process and planning to make it successful. The above mentioned program not only has to be qualitatively at par with the various accreditation norms but should also be financially viable. We, in this paper depict our experience in developing a minimally invasive and robotic cardiac surgery program at our center, pointing out the steps followed as well as our own experience.

### INCEPTION OF THE CARDIAC SURGERY PROGRAM

The Cardiac Surgery program at our new center was started in October 2018, with the vision of making it one of the leading centers in India for minimally invasive and robotic cardiac surgery. With an experience of over 30 years in the field of cardiac surgery and over 20 years in the field of minimally invasive and robotic cardiac surgery we were also fully supported by the hospital management. But in-spite of all this, we had our own challenges. We were determined to give our best in terms of quality and affordability to make it a successful and viable program. The strategies we used and the results of our program have been discussed subsequently.

### RESULTS

We have done a total of 105 cases of minimally invasive and robotic cardiac surgery, 92 cases by minimally invasive technique and 13 cases of robotic assisted coronary artery bypass grafting since the start of the program. We did our first case of minimally invasive cardiac surgery within a month and first robotic cardiac

surgery within 4 months of starting the program. We have done 2 cases of trans-catheter aortic valve replacement (TAVR) also successfully. Out of 92 cases of minimally invasive procedures, 55 cases were completed on cardio pulmonary bypass (CPB) which included mitral and aortic valve surgeries, atrial septal defect closure and right atrial mass removal. 37 cases were done by the off-pump technique which included coronary artery bypass grafting. Of the 55 cases completed on CPB, 32 patients were mitral valve replacements, 3 mitral valve repairs, 6 atrial septal defect closures, 13 aortic valve replacements and 1 patient of right atrial mass removal (**Table 1**). All the coronary artery bypass grafting were achieved by off-pump technique and included single as well as multi-vessel disease. Any patient who was willing for minimally invasive surgery and had no clinical contra-indication was taken up for the same.

The pre-operative characteristics of the patients have been discussed in **Table 2**. Mean age of patient for surgery on CPB was 43 years and those for coronary artery bypass grafting was 64.3 years. The patients for valve surgeries included all kinds of valvular lesions including mixed lesions but requiring intervention only of either mitral or aortic valve. Mean LVEF of the patients undergoing valve surgery was 48%. Mean CPB time for patients undergoing mitral valve surgery was 126 minutes and aortic clamp time was 61 minutes and the same for aortic valve surgery was 140 minutes and 76 minutes respectively. The mean CPB and aortic clamp time for ASD closures were 48 minutes and 26 minutes respectively (**Table 3**). All the patients were extubated on the same day and mean time to extubation was 5.4 hours. No patient required any conversion to midline sternotomy and there were no re-explorations. Mean ICU stay was 2 days for atrial septal defect closures and valve patients and mean hospital stay was 5.6 days with a median stay of 5 days (**Table 4**).

In the group of patients undergoing coronary artery bypass grafting, 28 patients had multi-vessel coronary artery disease and 9 had single vessel disease. Mean LVEF of patients undergoing coronary artery bypass grafting was 37% and with 7 patients having severe left ventricular dysfunction (LVEF < 30%). Mean number of grafts in patients with multi-vessel disease was 2.8 with 10 patients having more than 4 grafts (**Table 3**). All surgeries were completed by off pump technique and no patient required conversion to mid-line sternotomy. No patient required femoral vessel exposure or insertion of Intra-aortic balloon pump. The patients were extubated electively next day morning. One patient post minimally invasive CABG required re-exploration for bleeding and it was diffuse oozing from the chest wall which was controlled. Mean ICU stay for patients undergoing minimally invasive coronary artery bypass was 3.2 days with a median stay of 3 days and mean hospital stay was 6.2 days with a median stay was 6 days. Most patients had uneventful post-operative stay. One patient in CPB group and 2 patients in coronary artery group had superficial wound infection which was managed with dressing only (**Table 4**).

The Robotic cardiac surgery program at our centre is one of the most successfully running robotic cardiac

surgery program across India. In a short span of one year we have done 13 robotic assisted cardiac surgeries. Out of these 10 were multi-vessel disease and 3 were single vessel disease. Average number of grafts were 2.4. All the procedures were completed by off-pump techniques. No patient required conversion to midline sternotomy or institution of CPB. As in minimally invasive CABG, groin was draped in all patient but femoral vessels were not exposed. There were no re explorations, patients were electively extubated next day morning. There was no mortality, median ICU stay was 2 days and median hospital stay was 5 days (**Table 5**).

**Table 1: Number of minimally invasive and robotic cases**

		On CPB	OFF CPB (MICAS/ MIDCAB/ ROBOTIC)
Total	105	55	50
AVR		13	
MVR/Repair		32/3	
Atrial Septal Defect		6	
MIDCAB			12 (9 MIDCAB, 3 Robotic)
MICAS			38 (28 MICAS, 10 Robotic)
Miscellaneous		1	

**Table 2: Pre-operative characteristic of patients**

	On CPB	OFF CPB
Age	43 yrs	64.3 yrs
LVEF	48	37
Severe LV dysfunction (<30%)	-	7
Diabetes Mellitus	7	27
Hypertension	10	32
Smoker	6	15
Obesity	6	11

**Table 3: Mean CPB and Clamp times**

	CPB (min.)	AOXL (min.)
Mitral	126	61
Aortic	140	76
ASD	48	26

**Table 4: Post-operative Results**

	On CPB	OFF CPB
Time to extubation	5.4	11.7
Re-exploration	-	1
Conversion to sternotomy	-	-
ICU stay (median days)	2	3
Hospital stay (median days)	5	6
Wound infection	1	2

**Table 5: Robotic Cardiac Surgery**

Number	13 (10/3)
Mean LVEF	42%
Average number of grafts	2.4
Time to extubation	9.8
Re-exploration	none
Conversion to sternotomy	none
ICU stay (median days)	2
Hospital stay (median days)	5
Wound infection	none

## DISCUSSION

The healthcare delivery system is going through a major transition to ensure quality healthcare delivery at all levels. More and more tertiary care centres providing multidisciplinary tertiary care are becoming the norm to provide the patients with optimum care in fight against the biggest killers of the present times namely, heart disease and cancer. It has been a completely new and exciting experience to establish a new cardiac surgery unit at our tertiary care centre in the heart of the city and it was an even bigger challenge to establish the unit with minimally invasive and robotic surgery program which is not so common in our country in even established cardiac surgical units. The endeavour included everything from planning, supervision and commissioning of operating rooms, ICU, recovery rooms and cardiac catheterization laboratory, to recruitment of the staff, purchasing of instruments and equipments and setting up of the department protocols along with the anesthesia & ICU teams.

The administration worked in continuous consultation with us, to understand our requirements and help purchase the most advanced minimally invasive surgical equipments and instruments, purchase of Trans-esophageal ECHO (TEE) machine, setting up of the cath labs and provisions for hybrid OT etc. The robotic system we have is the most advanced robotic system in the world Da Vinci Xi system. The vision was to create a unit which was functionally perfect and maintained high standards of quality as given by Institute of Quality. Quality assurance in any cardiac unit is of paramount importance as it allows to measure the quality of the healthcare delivery at all times.

In the beginning, the team was divided in two, one which specialized in minimally invasive surgery to give the best results and quality to the patients with me leading the team. At the same time both teams were involved in the program gradually to familiarise everyone with tips and tricks of minimally invasive and Robotic surgery to develop a strong and well established program over time. The vision and time to achieve the same was set at 1-2 years. Though the rest of team members had exposure to minimally invasive cardiac surgery, I took the baton to train the team and make a strategy to develop the program as one of the best in the country.

### **The strategy to establish the program was split in three parts**

1. Performing minimally invasive cases with every member of the surgical team (surgeons, anesthesiologists, perfusionists, scrub nurses) to let them become familiar and confident with the new approaches.
2. Introducing junior surgeons to minimally invasive surgery in a stepwise and customized way, according to expertise and skills.
3. Developing new strategies together, particularly enhanced by the young staff members.

### **On the other hand, some quality indicators were measured, such as:**

1. Conversion rate: If so, was it to sternotomy or another incision?
2. Complications: Trying to figure out whether the alternative approach is to blame for the drawback or if any other cause was responsible for it.
3. Post-operative indicators: like time to extubation, re-exploration, intensive care unit stay etc.

Before starting any procedure, we would discuss the proposed incision. The incision is drawn with a sterile pen for teaching purposes. Should an enlargement or conversion be needed, security margins are settled (e.g., upper mini-sternotomy enlargement to full sternotomy, or axillary incision conversion to postero-lateral one etc.).

The three-step approach to introduce a program of minimally invasive surgery in a new place proved successful for several reasons. First of all, the results were good and patients were satisfied. We allowed all members of the surgical team to get in touch with the new technique. This allowed us to decide the approach according to individual skills and preferences in customized patterns and thus allowed the other team members to take up more responsibility with time. As responsible leader of the team, I gradually introduced juniors to the new surgical techniques giving them more role and responsibility. More complex cases were added as the team has gained experience. Before embarking on a minimally invasive program, one has to assume that any drawback is going to be regarded as linked to the alternative approach. Whether it is true or not is irrelevant, unless invasive and minimally-invasive patients are matched.

After gathering experience, the question is how to move forward with the program? There is no clear answer, since not all surgeons are at the same level of proficiency, or are still in their learning curve. Thinking in terms of contraindications rather than indications, as a last step of training, could be a reasonable marker. In other words, we are not expecting for the “perfect patient” to come and be an ideal candidate for a minimally invasive approach. We rather think about the contraindications, if any, for a minimally invasive procedure in every patient.

Establishing any cardiac surgical unit involves three basic steps: Structures, Staff recruitment and Training of the staff. The local as well as international accreditation norms like NABH and JCI and relevant guidelines were kept in mind at the planning stage itself. The success of the cardiac surgery services is highly dependent upon the practices being followed in the operating rooms. We have also planned for a hybrid operation theatre in our unit considering the future trends in the field of minimally invasive cardiac surgery and interventional techniques even in cardiac surgery. After infrastructure and staff recruitment, the next step is the establishment of processes and protocols as we discussed above. This included staffing norms, training, and an environment to create an assurance that the systems and processes would work when required. The real challenge comes when the patient requires to use the facilities at the hospital.

While proper emphasis is laid on systems, processes and protocols, there is one common factor which impacts all these and that is proper staffing. Availability of adequately trained multidisciplinary team consisting of doctors, nursing and paramedical staff in addition to adequate administrative support is the real challenge. The adequacy in numbers as per the staffing norms for different sections of the cardiac unit was a challenge by itself. A strong credentialing and privileging mechanism was made to ensure that only adequately qualified and trained people were authorized to undertake any activity within the system. The identification of training needs of each individual and organizing in-house or specialized training at defined regularity has been the key to meet this challenge. Having established the infrastructure and the protocols, one should concentrate on the outcome. As we said in our definition of Quality “The Quality has to result in increasing probability of achieving the desired outcome.” Recording of the outcomes and putting a trend analysis in place to ensure continuous quality improvement has to be a part of the whole process.

All the investment in terms of infrastructure, effort, time and money needs to converge in getting the desired results. Our results speak for us over past 20 months at our own newly established cardiac surgical unit doing all varieties of minimally invasive and robotic cardiac surgery along with conventional cardiac surgery.

## **CONCLUSION**

Minimally invasive, Hybrid and Robotic cardiac surgeries are becoming a routine practice in many centres worldwide. This has been true in our experience also as patients’ perceptions and expectations have changed. Patients increasingly ask for a therapeutic approach

that leaves the sternum intact. Those doctors who want to meet this new challenge therefore need to realize that minimal incisions in cardiac surgery require greater technical skills. The different approaches need their own learning curve, either straightforward or a steep one. Our recent experience demonstrates that a comprehensive, three-step schedule allows a safe and custom-made approach to train new surgeons in the field and enhances their enthusiasm in developing further strategies on their own. A record of conversion-rate and complications should be used as marker of performance and quality standard. The new adopters can take their own training pace according to their level and skills. Interestingly, the wider the offer of approaches, the more ideas come up for new alternative minimally invasive methods. Our initial results at our newly established centre proves the efficacy of our approach.

# Radiological Services In A Nutshell

■ M L Bera

Consultant & HOD Radiology, Manipal Hospital, Dwarka

**Key words:** Tele-radiology; Picture Archiving and Communication System (**PACS**); Real Time Interactive Radiology (**RTIR**), Percutaneous Transcatheter Coronary Angiography & Angioplasty (**PTCA**), Interventional Radiology (**IR**), Vascular and Interventional Radiology (**VIR**), Multi Detector Computerized Tomography (**MDCT**), Magnetic Resonance Imaging (**MRI**), Artificial Intelligence (**AI**), Machine Learning (**ML**), Deep Learning (**DL**)

## INTRODUCTION

The practice of radiological services is undergoing rapid change in recent years due to technological advancement, workload escalation, workforce shortage, privatization, corporatization and globalization of healthcare facilities. With more and more advanced cutting edge technologies, now the radiological services have transformed into multiple sub-specialities with a challenging future. This sudden proliferation of radiological services into multiple sub-specialities has led to workload escalation and workforce shortage adversely affecting the quality of patient care and patient safety.

## NATURAL HISTORY

Discovery of X-rays in 1895 by **Professor Wilhelm Conrad Roentgen** fetched him the first Nobel Prize in physics in 1901. This helped to design and manufacture X-ray equipment and was the beginning of a separate medical speciality- "**Radiology**". This discovery of X-rays created a lot of interest among the medical fraternity and lot of research work was carried out to study the physical properties and biological effects of this unique high energy photon beam. One year later in 1996, X-rays were used by **Emil Herman Grubbe** to treat a patient with breast cancer to demonstrate its therapeutic efficacy.

By mid-2000, with rapid technological advancement in the diagnostic as well as therapeutic fields supported by dedicated clinical research, this medical specialty (**Radiology**) was divided into two sub-specialties- **Diagnostic radiology and Therapeutic radiology**.

A sudden technological outburst in diagnostic radiology was witnessed in mid-80s leading to development of multiple diagnostic imaging tools based on different principles to aid in the diagnosis of diseases. Subsequently these imaging tools underwent digital transformation for better and more accurate diagnostic

yield. This spectrum of imaging tools included Digital Radiography, Catheter angiography & Digital Subtraction Angiography (DSA), Mammography, CT scan based imaging, MRI based imaging, Ultrasound based imaging, Isotope based imaging and Fusion imaging etc.

During the same period use of radioisotopes for diagnostic and therapeutic purposes became widespread and there was a need to develop a new speciality to control their proliferation and effective use and accordingly the American Board of Nuclear Medicine was formed in 1972—thus heralding the beginning of a new speciality - "**Nuclear Medicine**". This specialty included the use of all radioisotopes in medicine for diagnostic as well as therapeutic purposes. This sudden outburst of different imaging tools has led to acute shortage of skilled manpower.

## TECHNOLOGICAL ADVANCEMENTS

Since the beginning of this century there is exponential growth and advancement in the field of hardware & software with digitalization of imaging platforms. This has aided further in developing advanced clinical application of various imaging tools with revised and modified imaging protocols for better diagnostic yield. In recent years Artificial Intelligence is gaining importance with numerous and far expanding applications for assistance as well as decision making in the health care system and medical imaging field.

### (a) Advancements in Hardware & Software:

**Digitalization of imaging tools** was a technological revolution in diagnostic imaging and helped to cut-short post processing time and reduce radiation to patients. Digitalization also helped effective manipulation of images by computers and development of an effective **Picture Archiving and Communication System (PACS)**. This helped medical professionals to view clear and detailed images of body parts within shortest possible time after the examination is over. This system also assisted hospitals to cut cost, help save critical time for study of images after completion of the examination as well as digital storage of images for long time follow-up. After having developed digital platform for various imaging tools with effective communication and storage system, the future of radiological services appeared bright in the form of **Tele-radiology and Real Time Interactive Radiology (RTIR)** to overcome various shortcomings in the field of imaging services.



**Tele-Radiology** is a fast developing technique for viewing images away from its origin. It utilizes standard network technologies like internet services/ telephone lines (4G services), broad band services like **wide area network** (WAN) and **local area network** (LAN). A specialized software is used to transmit the images from its origin to user site. It improves patient care by allowing radiologists to provide services without actually being at the place of imaging. **This is quite useful in providing expert opinion for scans done in remote locations.**

**Real Time Interactive Radiology (RTIR)** is a unique system where specialised software is used to allow multiple doctors to view the images at the same time from different locations and assist them for interactive discussion to develop a much needed common consensus for management of pathological lesions.

**(b) Advancements in Clinical Application**

Recent advancement in hardware/software with digitalization of imaging tools have helped to develop newer & advanced imaging protocols to improve diagnostic skill in all fronts.

**CONVENTIONAL RADIOLOGY**

After remaining in the limelight for more than three quarter of a century, conventional radiology lost its glory after evolution of sectional imaging tools in the form of CT scan, MRI and USG. Though digitalization of radiography equipment have reduced much needed radiation dose to patients with enhanced diagnostic yield, conventional radiology has lost it's much claimed popularity and now use of conventional radiology is limited to remote locations and selective imaging of chest, bones & joints and in emergency situations.

**(Image 1)**

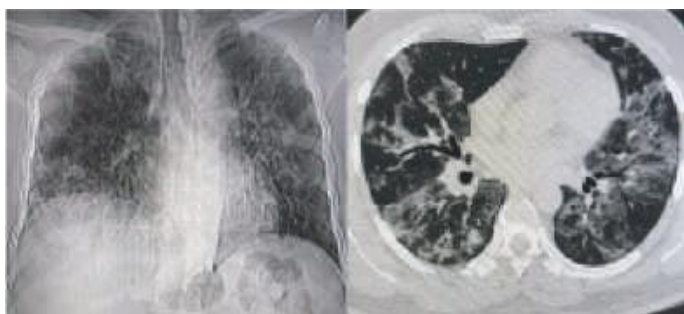


Image 1: Chest X-ray & HRCT showing subpleural & peribronchovascular ground glass opacities suggesting Atypical Pneumonia

**ULTRASOUND & ITS CLINICAL APPLICATIONS**

USG is a non-ionizing imaging tool with wide clinical applications in diagnostic imaging as well as interventional radiology, 2D grey scale, 3D/4D Color Doppler & Power Doppler are widely available for diagnostic

purposes whereas Endocavitary, Transesophageal & Endovascular probes are more appropriate for targeted studies. USG is now extensively used in **fetal medicine & IVF clinics** to monitor fetal wellbeing in utero and assisting IVF procedures. **(Image 2)**

**Ultrasound Elastography** has received substantial attention in recent years for non-invasive assessment of tissue mechanical properties with its wide applications in the imaging of liver, breast, thyroid gland and musculoskeletal system. **Sono-histology (Ultrasonic Bio-microscopy)** using 40-200 MHz probes to provide near histological tissue resolution is now a reality.

**Ultrasound is useful** as per-operative imaging tool for surgical guidance and helps in various image guided diagnostic & therapeutic procedures. **High Intensity Focused Ultrasound (HIFU)** is now a well-established non-surgical procedure for treatment of Uterine Fibroid.

**Ultrasound molecular imaging** is a fast developing technique to diagnose and monitor pathological processes at the molecular level. This is done with the help of novel molecularly-targeted ultrasound contrast agents that can visualize disease process at the molecular level by accumulating at tissue sites overexpressing certain molecular markers. Currently most widely used molecular ultrasound contrast agents are micron sized gas bubbles that are composed of a gas core stabilized by a surrounding shell (composed of phospholipids, biocompatible polymers or proteins) tagged with targeting ligands. The targeting ligand can be antibodies, peptides or natural/engineered scaffolds and can be directly incorporated into the shell during or after micro bubble synthesis. These molecularly targeted micro-molecules get accumulated at the targeted tissue sites expressing the molecules after injecting into blood. Various clinical applications of ultrasound molecular imaging include inflammatory lesions, inflammatory bowel disease, Ischemic changes, Inflammation in atherosclerosis and Cancer Imaging.

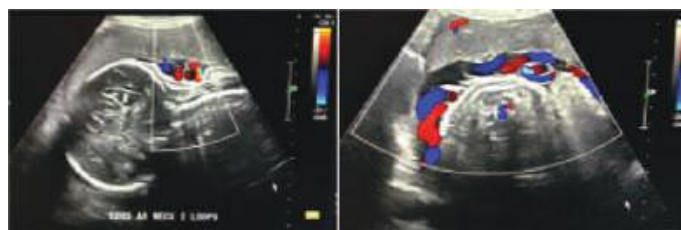


Image 2: Obstetric Doppler showing double loop of cord round the neck

**MDCT & ITS CLINICAL APPLICATIONS**

The current decade has seen MDCT as a valuable imaging tool with many fold increase in its clinical applications and diagnostic yield. Now MDCT is capable of scanning the whole body from head to toe within seconds with minute structural detail. The isotropic

volumetric data set from MDCT provide excellent image quality in all orthogonal planes and excellent 3D images for best possible image interpretation and their clinical correlation. MDCT has vast clinical application in diagnostic imaging and considered as gold standard for non-invasive evaluation of thoracic lesions, abdominal pathologies, cardio-vascular systems and trauma imaging. **(Image 3 & 4)**

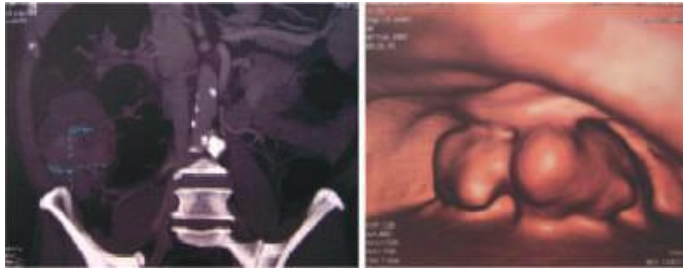


Image 3: Large polypoidal caecal growth as seen in Virtual Colonoscopy



Image 4: CECT & CT Angiogram showing evidence of multiple comminuted fractures with vascular injury

MDCT is a valuable imaging tool **for effective evaluation and monitoring of Coronary Artery Disease (CAD) and is capable of identifying & evaluating various useful cardio-vascular risk factors related to atherogenesis.** It also help in evaluating various structural and functional aspects of heart. It is **considered as gold standard for non-invasive evaluation of peripheral vascular disease and pulmonary vasculature. (Image 5 & 6)**

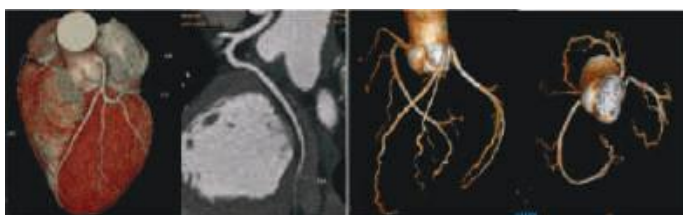


Image 5: Coronary CT Angiogram – excellent depiction of Coronary Artery Anatomy



Image 6: CT Angiogram – Patient with severe pain and weakness of left upper limb, Angiogram findings reveal multiple emboli in Subclavian Artery, Radial & Unlar Arteries

Multi-planar and 3D image reconstruction facilities have also helped us to understand image morphology

and made the basis for pre-procedural / pre-surgical treatment planning and provided road map to carry out difficult & complicated surgical procedures including Endovascular therapeutic procedures with great ease. This also helps for accurate assessment of vascular structures and volumetric assessment of organs as pre-transplant procedure. **(Image 7)** Now MDCT is also frequently used to assess intraluminal pathologies of Colon & Tracheobronchial tree with the help of **Virtual Colonoscopy & Virtual Bronchoscopy respectively.**

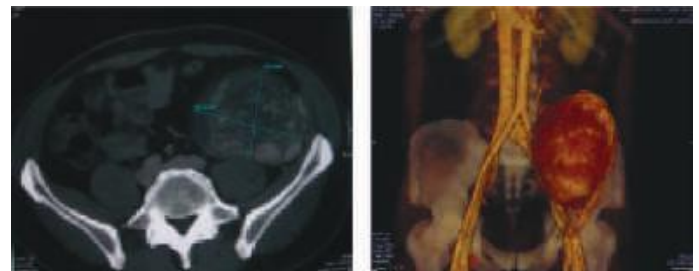


Image 7: Contrast CT Abdomen with Angiogram – Large Pelvic Tumour with Arterial Supply & Venous Drainage to Common Femoral Vessels

## MRI & ITS CLINICAL APPLICATIONS

MRI is a non-ionising imaging tool with wide clinical application. With its advanced imaging protocols and multilane imaging capabilities, it provide better contrast resolution and superior soft tissue characterization with excellent diagnostic yield. **Advanced MR imaging protocols coupled with perfusion, diffusion & chemical shift imaging, MR-spectroscopy, functional imaging and Diffusion Tensor Imaging (DTI) with fiber tractography are specific neuroimaging techniques and considered as gold standard in stroke & cancer imaging. (Image-8)**

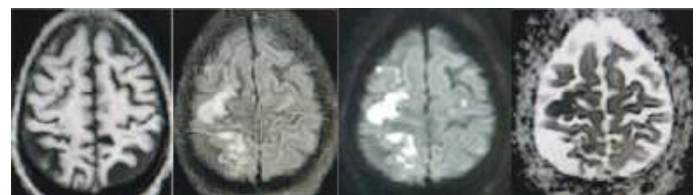


Image 8: T1, Flair, DWI & ADC images showing Hyperintensity in Flair with diffusion restriction and low ADC values suggestive of Acute Infarct

Cardiac MRI (CMR) is a rapidly growing, non-invasive/ non-ionizing imaging modality for evaluation of heart. CMR is increasingly used to evaluate rest and stress perfusion, and to identify myocardial ischemia and infarct with a high degree of accuracy. CMR is now considered gold standard for cardiac function assessment and myocardial viability prior to revascularization process in Coronary artery disease. With its superior tissue characterization capability, MRI is paving the way ahead in the imaging of musculoskeletal system and breast imaging. **(Image-9)**

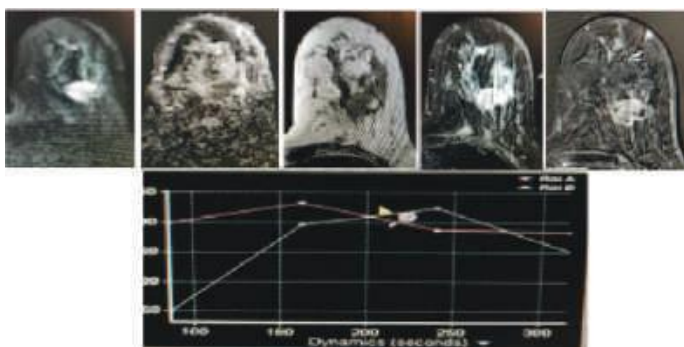


Image 9: Dynamic Breast MRI – DWI, T2 and Fat Sat T2 and Dynamic Contrast Scan with Type-3 Curve suggesting Malignant Lesion

MRI is not only helpful for visualization of vascular tree & Hepato-biliary systems without using intravenous contrast agents, but its Tissue / System specific imaging protocols are also helpful in selective non-invasive evaluation of tissue/organs quite effectively (MR-Elastography, MR-Cisternography, MR-Enteroclysis, MR-fistulogram, MR-urography etc.).

Now tailor made portable MRI equipment are available for specific evaluation of body parts (MR mammography, Standing MRI for Jt.) and also helpful for real time assessment for operative procedures. MRI also helps in non-invasive real time treatment planning- **MR guided HIFU.**

## INTERVENTIONAL RADIOLOGY

**Interventional radiology (IR)** or sometimes called Vascular and Interventional Radiology (VIR) is a **fast evolving subspecialty of radiology.** It is an invasive method with multiple clinical applications (Diagnostic as well as therapeutic). The basic concept behind IR is to **diagnose diseases** or **treat pathology** with a minimally invasive technique using image guidance. The images provide road maps that allow the interventional radiologist to guide the instruments (needles and catheters, stents etc.) through the body to the area of interest. **(Image-10)**



Image 10: CT Angiogram in Aortic Aneurysm – Pre & Post Stenting: Aortic Arch & Infra renal Aortic Aneurysms

Various imaging tools (USG, Fluoroscopy/C-arm, CT scan, MRI etc.) help to develop diagnostic & therapeutic skill by invasive means and created sub-speciality areas like Percutaneous Trans-catheter Coronary angiography & Angioplasty (PTCA), Peripheral Vascular Intervention & Endo-vascular therapy, Biliary Intervention and Image guided diagnostic/therapeutic procedures (FNACs, aspirations, Biopsies & Catheter drainage etc.). This also helps in extensive use of imaging tools for cosmetic /

reconstructive surgery, robotic surgery and oncological practice.

**Various advantages of IR** include minimisation of risk of physical trauma to the patient and reduces procedural risks, infection rates, pain recovery time. This also helps in cutting down hospital stay, being mostly OPD/Day care procedure. These procedures are mostly done under LA and are not only quick, safe and easy to perform in geriatric patients but also less expensive compared to surgery.

## HYBRID IMAGING (FUSION IMAGING)

Hybrid imaging refers to the fusion of two (or more) imaging modalities to form a new technique. By combining the innate advantages of the fused imaging technologies synergistically, usually a new and more powerful modality comes into existence. With technological advancement, now it is possible to fuse two or more different images with different characteristic (anatomical, physiological & functional etc.) to form a single image (Fusion image) depicting all these characteristic in a single image (Example -PET-CT, SPECT-CT, PET-MRI, SPECT-MRI, MRI-CT, MRI-USG etc.). These images provide structural and functional information through a single output and have wide application in oncological practice with increased diagnostic accuracy. **(Images 11 & 12)**

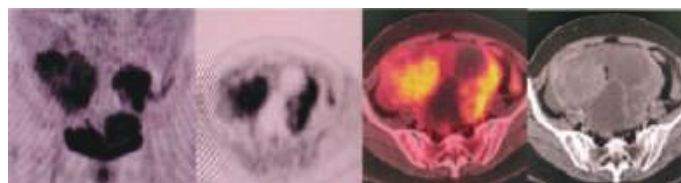


Image 11: PET-CT in B/I Adnexal Mass – PET reveals metabolically active bilateral pelvic lesions and CT can localized them to be adnexal in origin

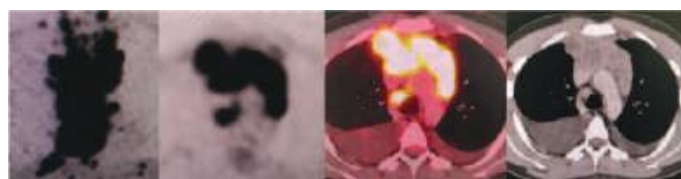


Image 12: PET CT in Mediastinal B-Cell Lymphoma – PET scan reveals metabolically active mediastinal mass lesions and CT scan localizes them to be mediastinal L-node masses

## MEDICAL ROBOTICS

A relatively new concept and still in its infancy. It is likely to secure huge place in minimally invasive surgery in near future. Mechanical robots are employed mostly at present with limited use. Before its wide application, more intelligent robots with faster and automated / user friendly operating system need to be developed which can be integrated with any imaging tool for path finding and treatment execution. Robotics is also useful in interventional procedures.

### **(c) Impact of Artificial Intelligence (AI) in Medical Imaging**

In the recent years **Artificial Intelligence (AI)** with the help of **Machine Learning (ML) & Deep Learning (DL)**, technology is gaining importance in the medical imaging field with numerous and far expanding applications. These applications are aimed to support automation and streamlining the tasks **to improve efficiency, accuracy and consistency.**

Early applications of **AI** in medical imaging included computer aided-detection and diagnosis software (CADe & CADx) based on **Machine Learning (ML)**. Large sets of widely available data sets across imaging modalities have supported the development of **ML based algorithms** and form the basis for computer assisted diagnosis. These ML based software analyze radiological images to suggest their clinically relevant findings and aid diagnostic decisions based on image morphology. These applications are widely utilized in screening exams such as mammography, chest CT screening and Colonoscopy. In addition some applications also aided in determining whether a lesion is malignant or benign.

**Deep Learning** is a subset of machine learning that is **based on a neural network structure** loosely inspired by the human brain. Such structures learn discriminative features from data automatically, giving them the ability to approximate very complex non-linear relationships. While earlier **AI** methods have led to applications with subhuman performance, **recent deep learning algorithms** are able to match and even surpass humans in task-specific applications in an increasing number of simple tasks, such as detection of pneumonia on a chest X-ray or analysis of white matter lesions on MRI scan of brain. With automated detection, radiologists view images based on reading priority which speeds reporting and improves patient outcomes. With the addition of retrieval services, the **AI** pulls similar images from the database for review when it encounters unusual or complex cases.

Now **AI algorithms**, particularly deep learning, have demonstrated remarkable progress in image-recognition tasks, recognizing complex patterns in imaging data set and providing quantitative, rather than qualitative, assessments of radiological characteristics in an automated fashion. Now more accurate and reproducible radiological assessments can be made with integration of **AI** into the clinical workflow as a tool to assist radiologist & physicians. Examples of various clinical application areas of artificial intelligence in radiology include cardiac imaging thoracic imaging, abdominal and pelvic imaging, brain imaging, colonoscopy and mammography for early detection of disease processes and their therapeutic planning.

**AI** has led to major advances in applications ranging from

web search and computer vision, tasks that until a few years ago could be done by humans. Within health care, it is becoming a major constituent of many applications, including virtual assistant, remote patient monitoring, medical imaging and diagnosis, risk management and hospital management. According to experts, the benefits of **AI** for Radiology are numerous. It can reduce workload by doing tedious tasks like segmenting structures enabling more quantitative imaging, which most believe will improve the product of Radiology.

In near future, **AI** is going to help Radiologist, the patients, and the referring clinicians and going to make us more accurate, make the field safer, and help us provide more value to our services, than we are able to provide today.

### **FUTURE OF RADIOLOGY**

Apart from digitalization of Imaging tools and development of **PACS, Tele-radiology & Real Time Interactive Radiology (RTIR)** are becoming a reality. There is also significant advancement in stroke, cardiac and cancer imaging with paradigm shift from **anatomical & physiological** imaging to **molecular, bio-chemical & functional** imaging tailored for individual organ with more emphasis on fusion imaging. **Tele-radiology** is likely to receive wide recognition to overcome manpower shortage and **AI** is likely to assist Radiologist for quick and more accurate value added diagnostic work up.

### **THE CHANGING SCENARIO**

With technological advancement patients now enjoy the benefit of early diagnosis and less invasive treatment alternatives with less cost and lower morbidity and mortality.

However due to sudden outburst of different imaging tools with increasing volume and complexity of work, there is acute shortage of skilled workforce to meet the growing demand on day-to-day basis. This may lead **to workload/workforce imbalance and may adversely affect the quality of patient care and patient safety in the coming days.**

### **CONCLUSION**

With development of various modern imaging tools with advanced imaging protocols coupled with fusion imaging, now Radiology has taken the center- stage in day-to-day patient care. Apart from its accurate diagnostic capability for various disease processes, **radiology is very much in demand for its therapeutic applications, pre-therapeutic planning and prognosticating the outcome of disease processes.** In near future, **AI** is going to be real companion and path finder in diagnostic decision making and therapeutic planning and will make us more wise, accurate & safe than what we are to-day.

# Pathophysiology of Foetal to Neonatal Transition and Evidence based Delivery Room Management

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## ABSTRACT

Knowing pathophysiology of neonatal transition from intrauterine to extrauterine life helps in understanding immediate neonatal problems in a better way. Delayed cord clamping is now standard of care in uncomplicated term and pre-term singleton deliveries. Endotracheal suctioning of both vigorous and non-vigorous baby born through meconium stained liquor is no longer recommended. Heart rate assessment after birth is feasible with ECG but auscultation is still the preferred method. Prevention of hypothermia after birth in a pre-term baby should be the priority of attending neonatologist.

## ABBREVIATIONS

**DCC**-delayed cord clamping, **PPV**-positive pressure ventilation, **FRC**- functional residual capacity, **GDM**-gestational diabetes mellitus, **PIH**-pregnancy induced hypertension, **GA**-gestational age, **NRP**-neonatal resuscitation programme, **ILCOR**-The International Liaison Committee on Resuscitation.

## INTRODUCTION

One-fifth of global live births occur in India. India contributes more than 25% of global neonatal deaths, which is predominantly due to intrapartum related events and prematurity. Nearly one third of neonatal death occurs within first 24 hrs of life. So knowing pathophysiology of foetal to neonatal transition helps in better understanding of immediate new born period problems. Evidence based delivery room management has greater impact on decreasing neonatal deaths in resource poor countries like India. The purpose of this review is to guide attending neonatologist about immediate new born issues and management of neonates in the delivery room.

## PATHOPHYSIOLOGY OF NEONATAL TRANSITION

During in-utero life, a fetus depends on mother for both metabolic and gaseous exchange need, both of these actions are performed through placenta. After birth

multiple physiological changes are required for the survival of the newborn. Essential components required for a normal neonatal transition after birth are-

- Initiation and maintenance of breathing
- Clearance of fetal lung fluid
- Surfactant secretion
  - Transition of fetal to neonatal circulation (from parallel to series type).
  - Fall in pulmonary vascular resistance and increased pulmonary blood flow.
- Endocrine support for metabolic adaptation

Following the first initial breath, transpulmonary pressure increases which helps in the shift of the alveolar fluid into the lung interstitium. Catecholamines and corticosteroid surge before birth also help in lung fluid clearance. This leads to lung expansion and thus helps in the establishment of functional residual capacity (FRC). Lung expansion also helps in secretion of surfactant from type 2 alveolar cells which prevent alveolar collapse hence it helps in the maintenance of FRC. Once the air fills the new-born lung, there is fall in pulmonary vascular resistance (PVR). Clamping of the umbilical cord causes sharp increase in systemic vascular resistance (SVR). As SVR increases and PVR decreases, pulmonary blood flow increases, leading to increased oxygenation. All of these changes lead to closure of the patent ductus arteriosus. With increased pulmonary blood flow, left atrial pressure rises, leading to the closure of the foramen ovale. Corticosteroid, catecholamines and thyroid hormones surge before and during birth helps in metabolic adaptation of the new born after birth. These hormones causes rise in glucose and free fatty acid level which is essential for normal cellular activities in immediate new-born period. Nearly 95 % babies establish their FRC without significant help. The need for bag and mask ventilation is in approximately 3-5% of all new-borns which probably may be higher in developing countries due to poor perinatal services and other causes. The need for resuscitation is higher in premature babies, more than 90% of infants <29 weeks gestational age (GA) need

resuscitation in the delivery room with a peak of 97% at 25 weeks of GA and decreasing to 56% for infants at 32 weeks of GA.<sup>1</sup>

Identifying high risk delivery helps the attending neonatologist for better preparedness and so it helps in smooth neonatal transition and prevent both short and long term complications in the baby.<sup>2</sup> These perinatal risk factors are listed below. **(Table 1)**

Maternal risk factors	Foetal causes
• GDM	• Foetal distress
• Maternal smoking	• Meconium stained liquor
• Chorioamnionitis	• Multiple gestation
• Placenta Previa	• Post-dated Pregnancy
• PIH	• Prematurity
• Uterine rupture	
• Placental abruption	
• Precipitous delivery	
• Prolapsed cord	

Table 1: Perinatal Risk Factors predicting High Risk Delivery

## Evidence based delivery room management-

### DELAYED CORD CLAMPING (DCC)

Delayed cord clamping is defined as clamping cord after 30-60 seconds of birth or when cord pulsation has ceased. DCC is now recommended in uncomplicated deliveries where fetus does not require resuscitation. This helps in continued blood flow between the placenta and newborn which may improve iron status in the infant for up to three to six months after birth. This may be particularly relevant for infants living in developing countries where iron deficiency is very common.<sup>3</sup> As compared to normal vaginal delivery, benefits of DCC after caesarean delivery on adequate placental transfusion is less. There is nonsignificant increases in blood volumes after DCC compared with early cord clamping in babies delivered through caesarian section. In pregnancy complicated with intrauterine growth restricted (IUGR) fetus, researches are in favor of delayed cord clamping. There is no significant harm noted after DCC in IUGR baby. In Multiple pregnancy, DCC can be recommended in Dichorionic twins (moderate to low quality evidence).<sup>4</sup> More research are needed to find out benefits and harms of DCC to the mother with monochorionic twins. Till now, evidence are not in favour of delayed cord clamping in monochorionic pregnancy. The Australian Placental Transfusion Study (APTS), a Randomised Controlled Trial, found that for premature infants <30 weeks of GA, delayed cord clamping of 60 s as compared to 10 s decreases mortality by 30%.<sup>5</sup> It also prevents intraventricular haemorrhage in pre-term.

## Other different methods to improve placental transfusion in newborn are- CORD MILKING

In this method, the cord is grasped and the cord blood repeatedly pushed in the direction of the baby, for instance 3 times at a speed of 10 cm/s. cord milking have equivalent efficacy to delayed cord clamping but there is a four-fold increased risk of IVH in the most premature babies, so it is not recommended for <29 weeks GA premature babies. It can be alternative to DCC in rest of the babies who are non-vigorous at birth and going to require resuscitation.

### PHYSIOLOGICAL BASED CORD CLAMPING

In this method, the cord is not clamped until the baby has taken his first breath and cord pulsation stopped. Physiologic based cord clamping is associated with better outcome. Special resuscitation trollies are now available to be put beside the mother's bed enabling resuscitation with an intact umbilical cord. Researches are ongoing about its efficacy and harms in neonates.

#### Benefits of DCC -

- Increased iron stores
- Reduction in the risk of iron deficiency anaemia in infants
- Low risk of mortality and IVH in pre-term

#### Harms of DCC

- An increased need for phototherapy but this was not found in a recent study from Nepal.<sup>6</sup>

### SUCTIONING AFTER BIRTH

According to ILCOR 2010, routine intrapartum oropharyngeal and nasopharyngeal suctioning for infants born with clear or meconium-stained amniotic fluid is no longer recommended. A recent systemic review and meta-analysis on outcomes of endotracheal suctioning in non-vigorous neonates born through meconium-stained amniotic fluid reached to conclusions that initiating endotracheal suctioning soon after birth in non-vigorous meconium-stained infants may not alter the neonatal outcomes.<sup>7</sup> So as per current evidence available, endotracheal suctioning is no longer recommended in both vigorous and non-vigorous neonate born with meconium stained liquor.

### HEART RATE ASSESSMENT

Heart rate assessment after birth is very important because it helps clinician for assessing adequacy of positive pressure ventilation. Newborn heart rate can be assessed with direct auscultation of precordium or by umbilical cord palpation. Limitation of these methods of heart rate assessment in delivery room is

inaccuracy so it reports a lower heart rate compared to ECG. Pulse oximetry can also be used for heart rate assessment in the delivery room. Advantage of pulse oximetry is that it measures both saturation and pulse rate simultaneously and continuously. Limitation of this method is its sensitivity to poor tissue perfusion and may underestimate heart rate in the first minutes of life. Gold standard for assessing heart rate is ECG. ECG monitoring in the delivery room is achievable in both pre-term and term infants and it displays heart rate faster and more accurately than pulse oximetry.<sup>8</sup> Limitation of ECG is that it is not widely available in delivery room and may cause skin injury in extremely pre-term neonates. So auscultation is still the preferred method for heart rate assessment after birth esp. in resource poor countries till further evidence is available.

## POSITIVE PRESSURE VENTILATION (PPV)

Follow NRP 2015 algorithm for positive pressure ventilation initiation and monitoring. Early CPAP in the delivery room decreases the need for intubation and is associated with fewer days on mechanical ventilation and decreases need for surfactant. So NRP recommends a CPAP level of 5–6 cm H<sub>2</sub>O initially. When providing CPAP or PPV, the T-piece resuscitator is better than self-inflating bag because it allows for measurement and consistent PEEP delivery. In the delivery room, oxygen delivery can be provided by both high-flow nasal cannula (HFNC) and CPAP. Use of HFNC has been associated with higher rates of respiratory failure so CPAP is now preferred modality for initial respiratory support after birth in pre-term baby.<sup>8</sup>

## OXYGENATION IN THE DELIVERY ROOM

Recent researches are in favour of starting PPV in room air in Term and >32 weeks pre-term baby (although NRP recommends 21% FiO<sub>2</sub> for >35 weeks GA). In infants with GA between 28 and 31 weeks, an initial FiO<sub>2</sub> of 21–30% is appropriate. In <28 weeks pre-term, supplementing oxygen 30% is recommended for oxygenation during initiation of PPV.<sup>9</sup>

## Methods of holding face mask during Positive Pressure Ventilation (stem hold, c type (one handed), modified spider hold).

These are different methods to hold face mask during PPV for effective ventilation. All are nearly equally effective methods to hold face mask. (Fig 1)



Fig 1: Different methods to hold the face mask during PPV

## THERMAL CONTROL

After birth, baby temp falls rapidly and more the premature baby, greater the severity of hypothermia. Risk of mortality increases with hypothermia. So maintenance of thermal homeostasis is very important during immediate newborn period. Standard measures to prevent heat loss after birth are drying and wrapping the baby in pre-warmed towels followed by the placement of the infant under a radiant warmer. Keeping the temperature of the operating room 25 degree C also prevent neonatal hypothermia. Occlusive plastic wrapping prevents heat loss by evaporation in <29 weeks GA pre-term baby.<sup>9</sup> Other methods for hypothermia prevention are skin to skin contact after birth with mother ( esp. recommended for low birth weight babies in resource poor countries) and woollen cap use.<sup>8</sup> Providing heated and humidified gases if PPV or O<sub>2</sub> needed also helps in maintenance of thermal homeostasis.

## BABY TRANSPORT

Transport incubator with inbuilt ventilatory/CPAP facility is ideal for smooth transition of high risk babies from labour room/OT to neonatal intensive care unit. Exothermic heating mattresses also can be used for hypothermia prevention during transport. Transport incubator can also be used to transfer baby in stable medical condition from level 1 and 2 NICU to a tertiary care centre.

## SUMMARY

Nearly one third of neonatal deaths occurs during first 24 hrs of life due to intrapartum and prematurity related issues. Knowing pathophysiology of foetal to neonatal transition and evidence based delivery room management have impact on reducing both short term and ultimately long term neonatal complications. Delayed cord clamping, starting PPV within first golden minute of life, targeting age appropriate oxygenation and hypothermia prevention is now standard neonatal care practices.

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## REFERENCES

1. Haumont D, NguyenBa C, Modi N. E newborn: the information technology revolution and challenges for neonatal networks. *Neonatology*. 2017; 111: 388–97.
2. Sawyer T, Lee HC, Aziz K. Anticipation and preparation for every delivery room resuscitation. *Semin Fetal Neonatal Med*. 2018; 23: 312–20.
3. Delayed Umbilical Cord Clamping after Birth, American College of Obstetricians and Gynecologists (ACOG), number 684, January 2017.
4. Chavatat Ruangkit, Panyu Panburana , Anant Khositseth, et al, A Randomized Controlled Trial of Immediate versus Delayed Umbilical Cord Clamping in Multiple-Birth Infants Born Pre-term. *Neonatology*. 2019; 115(2): 156-163.
5. William Tarnow-Mordi , Jonathan Morris , Adrienne Kirby et al, Delayed versus Immediate Cord Clamping in Pre-term Infants. *NEJM*. 2017; 377(25): 2445-2455.
6. Rana N, Ranneberg LJ, Malqvist M, Kc A, Andersson O. Delayed cord clamping was not associated with an increased risk of hyperbilirubinemia on the day of birth or jaundice in the first 4 weeks. *Acta Paediatr*. 2019; 00: 1–7.
7. Nanthida Phattraprayoon, Wimonchat Tangamornsuksan, Teerapat Ungtrakul. Outcomes of endotracheal suctioning in non-vigorous neonates born through meconium-stained amniotic fluid: a systematic review and meta-analysis. *Arch Dis Child Fetal Neonatal Ed* 2020; 318941.
8. Weiner GM, Zaichkin J, Kattwinkel J, editors. *Textbook of neonatal resuscitation*, 7th ed. Elk Grove Village, IL: American Academy of Pediatrics, American Heart Association; 2016.
9. David G. Sweet, Virgilio Carnielli, Gorm Greisen, Mikko Hallman et al, European Consensus Guidelines on the Management of Respiratory Distress Syndrome :*Neonatology*. 2019; 115: 432–45.



# Stereotactic Body Radiotherapy (SBRT) – A New Paradigm in Radiation Oncology

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**Short running title:** Stereotactic Body Radiotherapy (SBRT)

## INTRODUCTION

Stereotactic body radiotherapy (SBRT) or stereotactic ablative radiotherapy (SABR) is defined as a method of external beam radiotherapy (EBRT) that accurately delivers a high radiation dose to an extra-cranial target/tumour in one or few treatment fractions<sup>1,2</sup>. SBRT uses 3D or 4D imaging to target high doses of radiation to the affected area. This results in very little damage to the surrounding healthy tissue. Like other forms of radiation, SBRT also works by damaging the DNA of the targeted cells. SBRT is used to treat various sites like lung, liver, spine etc. and is usually delivered within one to five sessions.

### Difference between Surgery and SBRT<sup>3</sup>

	Surgery	SBRT
Type of procedure	Diagnostic, staging & therapeutic	Only therapeutic
	In patient procedure	Outpatient procedure
	Invasive	Non-invasive
	Advantage of complete removal of primary tumour	Does not remove the tumour but damages the DNA of tumour cells and prevents them from multiplying
No. of days involved in treatment	Extended recovery period	Can vary from one day to ten days
Side effects/Complications	Bleeding, infection, post-operative side effects	Related to the site being treated
Mortality	Very low	Uncommon (usually lower than surgery)
Local control	Good to excellent	Comparable to surgery
Overall survival	Good to excellent	Comparable to surgery
Cause-specific survival	Good to excellent	Comparable to surgery

## Technique for SBRT

SBRT- simulation and planning workflow:

- Patient is made to lie down in supine position & arms are placed either above the head or over the chest depending on site to be treated (e.g. arms above head for SBRT lung, arms over chest for SBRT to lower spinal metastases).
- Immobilisation device is used depending on the site to be targeted. A Vac-Loc bag or a stereotactic body frame or a thermoplastic mask may be used.
- Certain positioning devices may also be used to make the patient comfortable (e.g. knee rest).
- After the above, a computerised tomography (CT) scan is acquired with or without contrast with a slice thickness of less than 3 mm for radiotherapy planning.
- In case of tumours with significant internal motion, a 4DCT (motion) scan is acquired.
- Once the above steps are executed, patient is asked to go home.
- Radiotherapy planning involves delineating the area of interest as follows-
  - > GTV: gross tumour volume as seen on CT scan and other imaging.
  - > CTV: clinical target volume which is the GTV with margin to include microscopic disease.
  - > PTV: 5 mm in all directions except cranio-caudal where 5mm - 1cm margin to be given depending upon motion.
- Once target is delineated on the planning CT scan, dose-fractionation schedule is decided depending upon site of disease.
- Examples of a few schedules:
  - > 48 Gray in 6 Fractions (2# per week) or 48 Gray in 8 Fractions (2# per week) for central lesions or 12 Gray in 4 Fractions for peripheral lesions in lung carcinoma.
  - > 24 Gray in 3 Fractions or 16 Gray in single fraction for spine metastases.
  - > 30-50 Gray in 5 Fractions for Hepatocellular carcinoma.
- Daily kVCBCT to be used for on board imaging (OBI) during treatment.

## Sites where SBRT is commonly used-

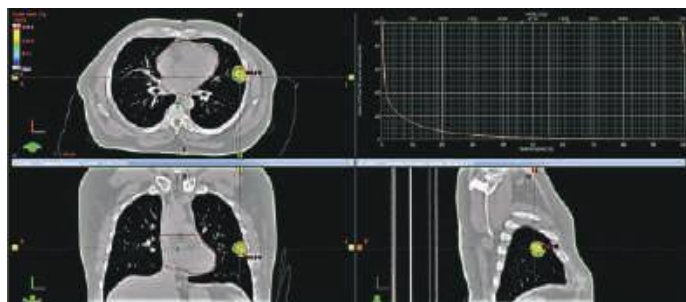
1. Thorax - Primary lung carcinoma (early stage), lung metastases (solitary)
2. Spine - Metastases (solitary or multiple)

3. Gastrointestinal - Hepatocellular carcinoma, liver metastases, pancreatic carcinoma
4. Genitourinary - Prostate carcinoma, renal cell carcinoma

#### Suitable patients for lung SBRT<sup>4</sup>

1. T1 N0 M0 / T2 N0 M0 primary tumour
2. Medically inoperable
3. Patients with <3 lung metastasis

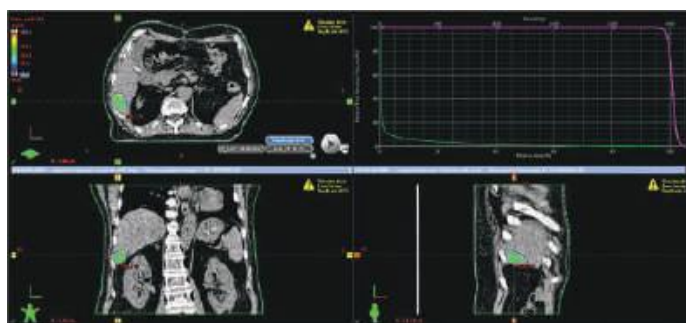
#### SBRT Lung



#### Suitable patients for liver SBRT<sup>5,6</sup>

1. Patients had to present no more than 3 metastases; no lesion >6cm; no lesion immediately adjacent to the GI tract (distance >6mm) in radiosurgery patients; and adequate pre-treatment baseline liver function.
2. Child Pugh A or early Child Pugh B
3. Cases unsuitable for resection or transplant or radiofrequency ablation (RFA) or unsuitable / refractory to trans-arterial chemo embolization (TACE).

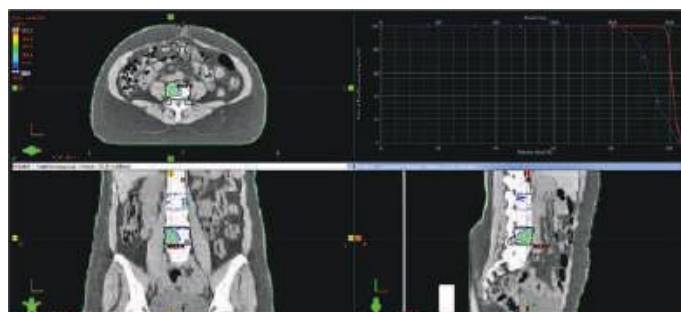
#### SBRT Liver



#### Suitable patients for spinal SBRT<sup>7</sup>

1. Localised spine metastasis from C1 to L5 (solitary metastasis or 2 separate spine levels or 3 separate sites) and each of the separate sites must have a maximal involvement of 2 contiguous vertebral bodies.
2. Spinal compression (if there is gap of >3mm between spinal cord & edge of epidural lesion).
3. Para-spinal mass (<5 cm) contiguous with spine metastasis.
4. Intractable pain

#### SBRT Spine



#### Advantages of SBRT

1. Non-invasive
2. Use of high-dose radiation
3. Delivery of one to five fractions within a few days (usually 1-7 days)
4. Decreased overall length of treatment
5. Greater patient convenience
6. Improved departmental capacity due to cost-effectiveness
7. Improved treatment response
8. No overt toxicities (very rare chance of grade 3-4 toxicity)

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#### REFERENCES

1. Munshi A, Krishnatry R, Banerjee S, Agarwal JP. Stereotactic conformal radiotherapy in non-small cell lung cancer - an overview. Clin Oncol (R Coll Radiol). 2012; 24(8): 556-68.
2. Guckenberger M, Andratschke N, Alheit H, et al. Definition of stereotactic body radiotherapy: principles and practice for the treatment of stage I non-small cell lung cancer. Strahlenther Onkol. 2014; 190(1): 26-33.
3. Tandberg DJ, Tong BC, Ackerson BG, Kelsey CR. Surgery versus stereotactic body radiation therapy for stage I non-small cell lung cancer: a comprehensive review. Cancer. 2018; 124(4): 667-78.
4. Videtic GM, Donington J, Giuliani M, Heinzerling J, Karas TZ, Kelsey CR, Lally BE, Latzka K, Lo SS, Moghanaki D, Movsas B. Stereotactic body radiation therapy for early-stage non-small cell lung cancer: Executive Summary of an ASTRO Evidence-Based Guideline. Practical Radiation Oncology. 2017; 7(5): 295-301.
5. Kumar S, Kapoor R, Oinam AS, Kalra N, Duseja A. Role of stereotactic body radiation therapy in liver metastasis: A pilot study from tertiary cancer institute in India. J Can Res Ther. 2019; 15: 169-75.
6. Gerum, S., Heinz, C., Belka, C. et al. Stereotactic body radiation therapy (SBRT) in patients with hepatocellular carcinoma and oligometastatic liver disease. Radiat Oncol. 2018; 13: 100.
7. Tseng CL, Eppinga W, Charest-Morin R, et al. Spine Stereotactic Body Radiotherapy: Indications, Outcomes, and Points of Caution. Global Spine J. 2017; 7(2): 179-197.

# A Rare Presentation of Mediastinal Teratoma as a Massive Pleural Effusion on Chest Radiography.

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## ABSTRACT

Teratomas are rare germ cell tumours usually found in the gonads. Extra-gonadal teratomas are extremely rare, with only a few cases of mediastinal teratomas have been reported previously in medical literature so far. We report a case of a patient with a mediastinal teratoma that mimicked a massive right pleural effusion on chest radiography.

## INTRODUCTION

Mediastinal teratoma are infrequently encountered and comprise 8%–13% of all mediastinal tumours, with high incidence noted in young patients.<sup>1</sup> Majority of primary germ cell tumours of the mediastinum are mature teratomas<sup>2</sup> and Immature mediastinal teratoma is very rare which is found in only 1% of all mediastinal teratomas.<sup>3</sup> Mediastinal teratomas in rare presentation are mistaken for large pleural effusions on routine chest x-ray, and computed tomography (CT) is considered the imaging investigation of choice for the evaluation of these masses.<sup>4</sup> We report a patient with a large, immature mediastinal teratoma that mimicked a massive pleural effusion on chest radiography.

## CASE REPORT

A 33 year male presented with dyspnoea, right sided dull aching chest pain, dry cough and weight loss of prolonged evolution without any history of fever or hemoptysis. He denied any history of contact with tuberculosis. On examination, the general survey was normal. Examination of chest revealed fullness over right side of the chest and shifting of mediastinum to the left. Percussion note was dull from right 2nd inter costal space downwards and breath sound was absent during auscultation of right chest. Examination of abdomen and testes revealed no abnormality. Complete hemogram and blood biochemistry along with laboratory inflammatory markers were within normal limits. Chest x-ray (PA view) revealed homogenous opacity involving whole of right hemithorax, with contralateral mediastinal shifting (**Fig. 1**), which raised the suspicion of pleural effusion.

Tomography scan (**Fig. 2, 3**) of the chest showed large right hemithorax pleural based lobulated mixed soft tissue density multi-septate predominantly cystic mass of 20.9 (mm) x 15 (mm) x 18 (mm) with soft tissue component space occupying lesion with adjacent right pleural effusion and underlying right lung atelectasis.

CT guided trucut biopsy (glandular elements, cartilage, neuroepithelial elements embedded in myxoid matrix representing derivatives of all three germ layers) suggested the diagnosis of immature teratoma. Serum  $\beta$ -HCG (2.25 mIU/ml, reference- 0.1-5.7 mIU/ml) was normal and alpha feto-protein (1210 mg/ml, reference < 15 mg/ml) was found grossly elevated. In view of raised serum alpha feto-protein and histopathological report of immature mediastinal teratoma, adjuvant chemotherapy was planned for our patient. Fortunately, he responded well to the chemotherapy and repeat radiological scan showed regression of tumour and now he is awaiting the surgery which is planned after completion of chemotherapy.



Fig 1. Chest radiograph shows homogenous opacification of right hemithorax mimicking massive pleural effusion

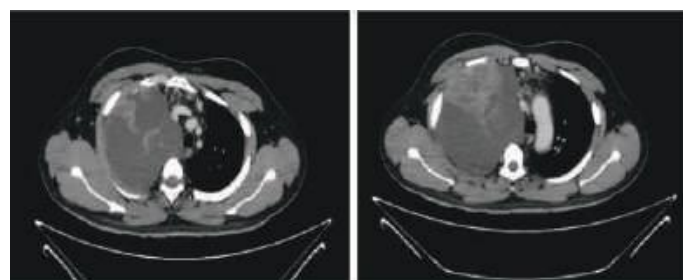


Fig. 2 (a)

Fig. 2 (b)

Fig. 2 (a) & (b): Axial contrast enhanced CT image shows large mediastinal teratoma. The right hemithorax pleural based lobulated mixed soft tissue density multi-septate predominantly cystic mass, adjacent right pleural effusion & underlying right lung atelectasis.



Fig. 3: Axial contrast enhanced CT image shows large lobulated soft tissue component space occupying lesion with leftward shift of mediastinal structures

## DISCUSSION

Germ cell tumours in the thorax can be secondary tumours, metastasized from the gonads, or developed de novo in the thorax. The extra gonadal germ cell tumours in adults are most commonly located in the mediastinum<sup>5</sup>. Most teratomas are benign and they grow slowly. Teratomas may present in any age group with equal prevalence among males and females, unlike malignant mediastinal germ cell tumours, which affect males more than females<sup>6</sup>. Symptoms of teratoma depend to their size, location, and tissue type of which they are comprised<sup>7</sup>.

Immature teratomas are rare tumours which differ from their benign mature counterpart in that they contain undifferentiated epithelial and / or mesenchymal tissue. They grow rapidly and penetrate the capsule frequently with spread or metastasis<sup>8</sup>. Measuring serum level of tumour markers like alpha-fetoprotein (AFP) and human beta-chorionic gonadotrophin ( $\beta$ -HCG) are important in the diagnosis and follow up of mediastinal germ cell tumours<sup>9</sup>. In patients older than 15 years of age with immature teratoma, complete surgical resection combined with chemotherapy results in long time survival. Unless both treatments are carried out, long term outcome is very poor<sup>10</sup>. It is unusual for a mediastinal teratoma to mimic a pleural effusion on chest radiography and the diagnosis of a mediastinal teratoma is often clinched based on the presence of fatty or calcified components within the mass – features that are better appreciated on CT scan. Most teratomas tend to exhibit heterogeneous attenuation on CT imaging<sup>4</sup>. However, the average attenuation of the teratoma in our patient was about 7 Hounsfield units which further confounded our interpretation.

We found that large, predominantly cystic, mediastinal teratomas have the potential to mimic large pleural effusions even on CT, hence we put forward that a large anterior mediastinal mass should be considered a possible differential diagnosis for young patients presenting with massive pleural effusion on chest radiography and CT scan.

## REFERENCES

1. de Castro MA Jr, Rosemberg NP, de Castro MA, et al. Mediastinal teratoma mimicking pleural effusion on chest X-rays. *J Bras Pneumol* 2007; 33: 113-5.
2. Nichols CR. Mediastinal germ cell tumors. Clinical features and biologic correlates. *Chest* 1991; 99: 472-9.
3. A Sarkar, PP Roy, SK Dey AK Dwari. Mediastinal Teratoma Mimicking Massive Pleural Effusion. *J Assoc Physicians India* 2010; 58: 453-5.
4. Moeller KH, Rosado-de-Christenson ML, Templeton PA. Mediastinal mature teratoma: imaging features. *AJR Am J Roentgenol* 1997; 169: 985-90.
5. Rana SS, Swami N, Mehta S, Singh J, Biswal S: Intrapulmonary teratoma: an exceptional disease. *Ann Thorac Surg.* 2007; 83: 1194-1196. 10.1016/j.athoracsur.2006.07.072
6. Zenker D, Aleksic I: Intrapulmonary cystic benign teratoma: a case report and review of the literature. *Ann Thorac Cardiovasc Surg.* 2004; 10: 290-2.
7. McKenney JK, Heerema-McKenney A, Rouse RV: Extragonadal germ cell tumors: a review with emphasis on pathologic features, clinical prognostic variables, and differential diagnostic considerations. *AdvAnatPathol.*2007; 14: 6992. 10.1097/PAP.0b013e31803240e6.
8. Hiroshima K, Toyazaki T, Iyoda A et al. Apoptosis and proliferative activity in mature and immature teratoma of the mediastinum. *Cancer* 2001; 92: 1798-1806.
9. Taniyama K, Ohta S, Suzuki H, Matsumoto M et al. Alpha fetoprotein producing immature mediastinal teratoma showing rapid and massive recurrent growth in an adult. *Acta Pathol Jpn.* 1992; 42: 91.
10. Das BB, Richardson C, Lala R, Sahoo S. Primary immature mediastinal teratoma in a newborn. *Indian Pediatrics.* 2001; 38: 1181-84.

# Enteric Fever associated Mild Encephalopathy with Reversible Splenial Lesion (MERS) of Corpus Callosum: A case report in 4 years old child with excellent prognosis

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## ABSTRACT

We describe a radio-clinical finding in 4 year old male child with enteric encephalopathy. MRI brain revealed lesions in the corpus callosum with restricted diffusion in sub-cortical and deep white matter of bilateral cerebral hemisphere. Mild encephalopathy with reversible splenial lesion (MERS) has been described in children and adults due to various causes including infection. However very few cases have been reported due to complicated enteric fever in children. Acute Disseminated Encephalo-Myelitis (ADEM) is the closest radiological similarity to MERS in paediatric age group.

## INTRODUCTION

MERS often used interchangeably with synonym RESEL (Reversible Splenial Lesion Syndrome) is a radiological finding described as a reversible lesion in splenium of corpus callosum found in mild encephalopathy/encephalitis patients due to varied etiologies including infections. Very few cases have been reported in association with *S. Typhi*. Even though enteric fever is endemic and its neurological complications have been varied. With ever increasing use of radiological investigations, emphasis is required on radiological features associated with enteric encephalopathy.

## CASE REPORT

A 4 year old male child was brought to the emergency room (ER) with history of fever of 5 days duration, multiple episodes of vomiting during initial 2-3 days, rash for 3 days, altered sensorium for 2 days and one episode of abnormal movement on the day of admission. On clinical evaluation, he was hemodynamically stable with normal respiratory pattern. His GCS was 11/15 with normal cranial nerve examination, no sign of meningeal irritation, normal tone with brisk DTRs and extensor plantar reflexes. Other systemic examination was normal except mild hepatomegaly.

His significant blood investigation showed Hb 9.8gm%, TLC 2730 with platelets count of 50000, sodium 130 meq/l and deranged liver function (AST /ALT 295/ 116 respectively). Lumbar puncture revealed CSF glucose 95, protein 24.5, Cells 02 (100% lymphocytes). CSF gram stain and culture were negative. Blood culture showed growth of *Salmonella typhi* sensitive to ceftriaxone. EEG revealed epileptiform discharges. MRI done on day 5 of fever revealed cytotoxic lesion of corpus callosum with restricted diffusion involving subcortical and deep white matter of bilateral cerebral hemisphere. (**Fig 1 and 2**)

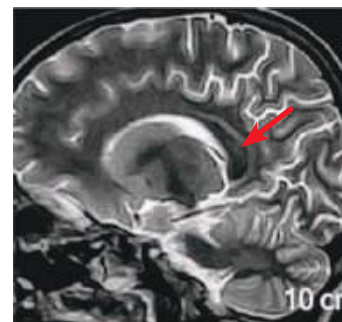


Fig 1: T2W Sagittal image - focal T2 hyper intensities in SCC

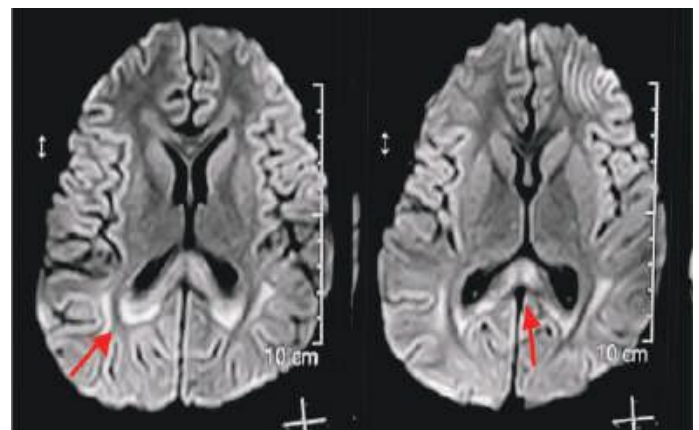


Fig 2: Axial flair images show flair hyper intensities in SCC & peri-callosal deep white matter

Child was initially treated with Inj Ceftriaxone, Inj Acyclovir, Inj Levetiracetam followed by addition of dexamethasone for enteric encephalopathy. He had

no further seizure episodes in the hospital. Fever subsided after 48 hours of antibiotics and steroid but his sensorium was altered till 10–12 days of admission with no new neurological finding. In view of not improving sensorium even after finishing course of dexamethasone for enteric encephalopathy, a repeat MRI brain and Spine was done on day 14 of illness considering probable ADEM, which however revealed complete resolution of previous lesions in brain MRI. (Fig 3) MRI of cervical spine was also normal. His repeat CBC, liver enzymes and inflammatory markers gradually improved and sensorium also gradually improved by D17 of illness. The child was discharged after 14 days of i.v antibiotics with final diagnosis of “Complicated Enteric Fever with MERS”. On follow up also his clinical neurological examination was unremarkable.

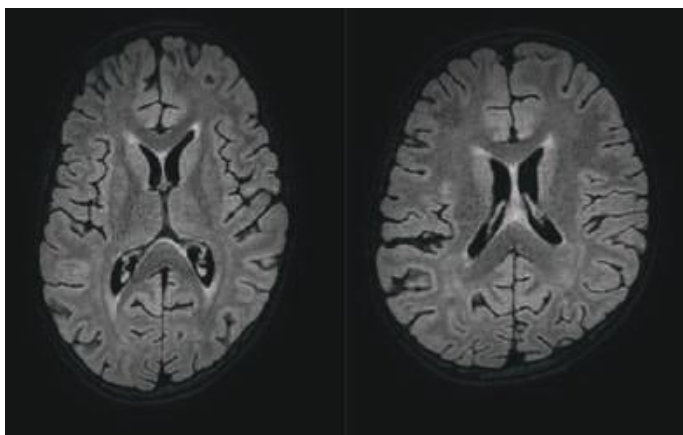


Fig 3: Follow Up Axial flair images shows resolution of splenial & deep white matter hyperintensities

## DISCUSSION

MERS is a radio-clinical entity and has been reported with varied etiologies like infections both viral and bacterial (such as influenza virus, rotavirus, measles, herpesvirus 6, adenovirus, mumps, Epstein-Barr virus, E coli, Mycoplasma, S. pneumoniae) epilepsy, antiepileptic drug use and withdrawal. Extant literature has reported other potential causes including substance withdrawal, metabolic disturbance, drug related toxicity, malignancies, cerebrovascular diseases, traumatic brain injury, status migrainosus, and high altitude disease (altitude sickness)<sup>1</sup>

Pathophysiology of MERS has been associated with inflammatory cytokines TNF Alfa, IL-1, IL-6 leading to cytotoxic edema in the neurons, astrocytes, and oligodendrocytes of the splenium of corpus callosum. Also contrary to the most notable characteristics of reversible lesions in the SCC, the lesions are not always completely reversible<sup>1</sup>

In a study by Takanashi et al, MERS presented with mild encephalopathy/delirious behavior in 54% of patients, consciousness disturbances in 35% and seizures in 33% of cases.<sup>2</sup>

Neurological manifestations of complicated enteric fever have a wide clinical presentation including encephalitis, delirium, meningitis, psychotic state, tremors, cerebellar ataxia which has been observed in about 27% of cases.<sup>3</sup> Severe dehydration, Widal TH  $\geq 640$ , and leukopenia have been implicated as the risk factors associated with higher rates of typhoid encephalopathy, probably reflecting prominent inflammatory response.<sup>4</sup> Pathologic findings in sub-acute encephalopathy are nonspecific and include cerebral edema, minimal ischemia, vasculitis, perivenous demyelination and cellular infiltrates.<sup>5</sup>

In Literature few cases have been reported of MERS associated with complicated enteric fever (puneet chopra et al 2019; Munawwar Ahmed et al 2011). We have presented a case of 4 year old male child with blood culture proven enteric fever who had features of mild encephalitis viz altered sensorium, seizure associated with fever. Meningitis was ruled out on the basis of neurological examination and normal CSF studies. On antibiotic and steroid treatment his fever though subsided in 48 hours, delirious behavior took almost 2 weeks to improve. Radiological features of MERS were completely resolved within 10 days of onset of symptoms as seen on repeat MRI.

A close differential diagnosis of ADEM was excluded as lesions were symmetrical and there was no contrast enhancement of the lesion in MERS in comparison to ADEM where there are multiple asymmetrical lesion which enhances on contrast. Also spine screening MRI was done which was normal. However in our patient, lesions were not just limited to SCC but the lesions also extended to subcortical and deep white matter.

**Competing Interest:** None

## REFERENCES

1. Syuichi Tetsuka, Reversible lesion in the splenium of the corpus callosum. *Brain Behav.* 2019 Nov; 9 (11): e01440. DOI: 10.1002/brb3.1440
2. Takanashi et al. Clinically mild encephalitis with reversible splenial lesion (MERS) after mumps vaccination. *J Neurol Sci* 2015; 349: 226–8.
3. Lakhotia et al. Neurological manifestations of enteric fever. *J Indian Acad Clin Med* 2003; 4(3): 196–199.
4. Leung DT et al. Factors associated with encephalopathy in patients with Salmonella enterica serotype typhi bacteremia presenting to a diarrheal hospital in Dhaka, Bangladesh. *Am J Trop Med Hyg* 2012; 86(4):698–702. DOI: 10.4269/ajtmh.2012.11-0750.
5. Munawwar Ahmed et al, Magnetic resonance imaging findings in a fatal case of Salmonella typhi-associated encephalopathy: A case report and literature review.

# EUS guided Biliary Drainage and Duodenal Stenting in a case of Advanced Pancreatic Cancer with Review of Literature.

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## ABSTRACT

**Background:** Endoscopic Ultrasound-guided Choledocho-duodenostomy (EUS-CDS) is a safe, innovative and minimally invasive interventional treatment for patients with surgical obstructive jaundice (SOJ) as an alternative to the surgical approach. To date, few cases have been reported in the literature.

**Patient concerns:** A case of pancreatic head carcinoma with obstructive jaundice occurred in a 75-year-old woman with gastric outlet obstruction.

**Diagnosis:** The patient was diagnosed with pancreatic cancer, duodenal obstruction, and distal biliary obstruction.

**Interventions:** EUS-CDS was performed. The wire and cystotome reached the position of stenosis, then a partially covered hybrid stent was released after CBD was accessed under EUS. A plastic stent was also placed inside the CDS stent. The position was confirmed via X-ray. An uncovered metallic stent was placed in the duodenum.

**Outcomes:** The symptoms of obstruction were alleviated. No adverse effects of obstruction, bleeding, perforation, and other complications occurred for the following 1.5 months.

**Lessons:** EUS-CDS may be reliable and effective for patients with SOJ with GOO.

## KEYWORDS

Endoscopic ultrasonography, gastric outlet obstruction, choledocho-duodenostomy, obstructive jaundice, pancreatic head cancer, EUS guided biliary drainage

## ABBREVIATIONS

**EUS-CDS:** Endoscopic Ultrasound-guided Choledocho-duodenostomy, **EUS -RV:** Endoscopic Ultrasound-guided Rendevous, **EUS-HGS:** Endoscopic Ultrasound-guided Hepatico-Gastrostomy, **EUS-GBD:** Endoscopic Ultrasound-guided Gall Bladder Drainage, **SOJ:** Surgical obstructive jaundice, **GOO:** Gastric Outlet Obstruction, **CBD:** Common Bile Duct, **EUS-BD:** Endoscopic

Ultrasound guided Biliary Drainage, **ERCP:** Endoscopic Retrograde Cholangio Pancreatography, **LFT:** Liver Function Test, **AST:** Aspartate Transaminases, **ALT:** Alanine Transaminases, **ALP:** Alkaline Phosphatase, **SEMS:** Self Expandable Metallic Stent, **FNB:** Fine Needle Biopsy

## INTRODUCTION

Pancreatic cancer is one of the deadliest malignant tumors with a median survival time of only 6 months<sup>1</sup>. This is because most pancreatic cancers have a high tendency to metastasize<sup>2</sup>. Pancreatic cancer displays no obvious clinical signs at an early phase and is usually diagnosed at an advanced phase with limited response to treatment<sup>3</sup>. Pancreatic head cancer develops rapidly, and the 5-year survival rate of patients with resectable tumors is only <5%. Obstructive jaundice is a common clinical manifestation of pancreatic cancers, especially in patients with malignant tumors of the head and neck of the pancreas<sup>4</sup>. Pancreatic cancer can also lead to GOO, which causes nausea, vomiting, difficulty in eating, and so on and seriously decreases the quality of life of patients. Surgery is the first choice to relieve biliary and enteric obstructions, but some patients lose the chance of surgery at the time of treatment. Therefore, patients who cannot tolerate surgery usually need to undergo endoscopic placement of a metal stent to ease obstruction.

ERCP is the current procedure of choice for patients with jaundice caused by biliary obstruction. It has a high success rate of 90-95% and a low major adverse event rate of 1-5%.<sup>5</sup> ERCP failure may be secondary to surgically altered anatomy, inaccessible papilla due to malignancy, or (rarely) cannulation failure. Usually, percutaneous drainage has been the treatment of choice in patients with failed ERCP. EUS-biliary drainage (BD) was first described by Giovannini in 2001.<sup>6</sup> Since then, EUS-BD has emerged as a creditable alternative to ERCP in patients requiring BD. Various studies have reported high technical success associated with EUS-BD.<sup>7</sup> Here we report a case of advanced pancreatic cancer with malignant distal CBD and duodenal obstruction treated with EUS guided biliary drainage and double stenting.

## CASE REPORT

A 75 yr old woman came to the Gastroenterology OPD with complaints of pain upper abdomen requiring occasional analgesics, gradually increasing jaundice and itching all over the body since last 15 days. She also complained of loss of appetite, nausea and vomiting and feeling of food struck in the abdomen. She had a past history of hypertension since last 5 yrs and hypothyroidism since last 3 yrs. On examination she had visible icterus and upper abdominal tenderness.

Her blood tests were as follows - CBC - Hemoglobin: 10.8 gm/dl, TLC: 17500 cells/mm<sup>3</sup>, Platelet count: 292000 cells/mm<sup>3</sup>, LFT: AST-154, ALT-286, ALP-643, S.Bilirubin-4.5 mg/dl, D.Bilirubin-4.2 mg/dl. Ultrasound of the abdomen showed a dilated biliary system till the lower end with a narrowing in the distal end of common bile duct. Further, PET-CT scan of the abdomen revealed a large irregular solid-cystic mass in the pancreas with internal cavitation and rim enhancement involving the head and uncinate process of the pancreas (3.8cm x 3.1 cm x 3.3 cm). The pancreatic mass was inseparable from D2 involving the lower end with mild peri-lesional stranding and nodularity.

Patient underwent Upper GI Endoscopy which showed severe duodenal obstruction with D1/D2 stricture with lot of gastric contents. Surgical oncology opinion was taken which suggested that the mass was unresectable. Endoscopic Ultrasound (EUS) was done which showed large Pancreatic mass (**Fig.1**) with heterogenous echotexture with calcification, large dilated CBD ~16mm (**Fig.2**) with dilated intra-hepatic biliary radicals. EUS guided Fine Needle Biopsy (FNB) from the pancreatic mass to extract a core biopsy was done using 22g Acquire FNB needle. The histology showed the mass to be Pancreatic Adenocarcinoma (**Fig.3**). In the same sitting we performed a EUS guided Choledoco-Duodenostomy (CDS) and placed a special partially covered partially covered self expanding metallic stent (Bonastent Biliary Covered 80mm, Hybrid SEMS, Sewoon Medical Co. Ltd, Korea) in the CBD from the first part duodenum (**Fig.4**). Further, a plastic stent 7fr x 10 cm double pigtail stent was placed inside the Hybrid stent to prevent future migration. Next day we placed another uncovered self-expanding metallic stent (9 cm, Boston Scientific, Wall flex SEMS) in the Duodenum to relieve the GOO (**Fig. 5 a,b,c**). The patient was discharged in a stable condition after 48 hours. LFT at the time of discharge was AST-24, ALT- 65, ALP-290, S.Bilirubin-2.4 mg/dl, D.Bilirubin-2.0 mg/dl. Thus, an advanced unresectable Pancreatic Adenocarcinoma with SOJ with GOO with EUS guided CDS was managed using Hybrid SEMS and Duodenal uncovered SEMS.



Fig.1: EUS - Pancreatic Mass



Fig.2: EUS picture of Large dilated CBD (16mm)

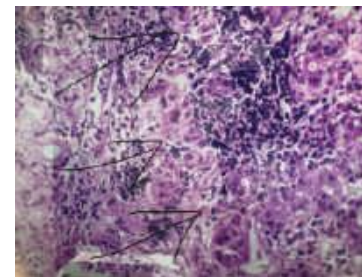


Fig.3: Histology of Pancreatic mass showing Adenocarcinoma



Fig 4: EUS-CDS done with Hybrid SEMS and 7fr x 10cm DPT in SEMS



Fig 5a

Fig 5b

Fig 5c

5a. Duodenal stricture before stenting

5b. Duodenal Stenting done with uncovered SEMS

5c. Fluoroscopy pic showing the 3 stents (2 SEMS, 1 plastic)

## DISCUSSION

EUS guided biliary access and drainage procedures represent likely alternatives to percutaneous or surgical interventions after failed ERCP but soon may directly compete with ERCP as a principal approach in selected settings. A recent systematic review of 42 studies



involving 1192 patients, looking at the safety and efficacy of EUS-guided biliary drainage, reported a cumulative technical success rate of 95%, functional success rate of 92% and complication rate of 23%. There was no significant difference in the technical success rate and adverse event rate between trans-duodenal and trans-gastric approach.<sup>8</sup> The common adverse events are bleeding, bile leakage, pneumoperitoneum, stent migration and cholangitis.<sup>9</sup> Another meta-analysis of EUS-guided biliary drainage done in 1437 patients from 23 studies, we report a pooled technical success rate of 91.5%, a pooled clinical success rate of 87%, and a pooled adverse event rate of 17.9%.<sup>7</sup>

EUS-guided biliary interventions broadly fall into the following categories<sup>9,10</sup>: (1) EUS guided wire rendezvous (EUS-RV) for biliary access, (2) EUS-guided trans-duodenal biliary drainage (EUS-CDS)—for distal biliary strictures (3) EUS-guided trans-gastric biliary drainage (EUS-HGS)—for proximal biliary strictures, accessed through the left lobe of the liver and (4) EUS-guided gall bladder drainage (EUS-GBD)

### **EUS-GUIDED RENDEZVOUS [EUS-RV]**

For biliary procedures, typically the common bile duct is visualized from the proximal duodenum or antrum, and a 19G FNA needle is used to puncture into the duct. Bile aspiration and needle cholangiography are then frequently used to confirm position and facilitate fluoroscopic guidance of the procedure, respectively. Subsequently, a long (450 cm) soft-tip guidewire is passed through the needle and manipulated across the biliary orifice and coiled in the duodenum. The echo-endoscope is then withdrawn from the patient and duodenoscope can then be advanced alongside the guidewire to the papilla, through which the trans-biliary guidewire exits. Subsequently retrograde biliary cannulation alongside this guidewire or the trans-biliary wire is grasped with a snare or forceps and pulling it through complete the rest of procedure is attempted. Another approach which is particularly useful for more proximal biliary obstructions like hilar blocks. This involves puncture into the left intrahepatic biliary tree from the gastric body or cardia in the segment 2 or 3 in the liver after EUS visualization. Fluoroscopy is used to ensure a rightward needle direction toward the hepatic hilum rather than the peripheral left intrahepatic ducts. With this approach, passage of a 4F to 5F cannula across the hepatico-gastric fistula may aid in efforts to manipulate the wire within the extrahepatic bile duct and across the biliary orifice.<sup>11</sup>

After attaining trans-biliary or transhepatic antegrade or retrograde guidewire passage across the biliary orifice, further interventions over the wire can be made. The most common intervention is deployment

of a plastic stent or SEMS across the biliary orifice solely under fluoroscopic guidance. However, other interventions such as antegrade balloon dilation to manage a biliary-enteric anastomotic stricture or balloon sphincteroplasty to facilitate biliary stone removal have also been reported.<sup>12,13</sup>

### **EUS-GUIDED TRANS-DUODENAL BILIARY ACCESS [EUS-CDS]**

The near proximity of the mid-portion of the extrahepatic bile duct to the posterior wall of the duodenal bulb is the basis for the creation of the EUS-guided choledochoduodenostomy (EUS-CDS). The most common indication for EUS-CDS is malignant distal biliary obstruction and failed biliary access at ERCP. With the echo-endoscope tip in the duodenal bulb, a 19G FNA needle or cautery device is used to puncture into the common bile duct, typically in a cephalad direction. After confirmation of position with bile aspiration and/or needle cholangiography, a long .025-inch to .035-inch soft-tip guidewire is advanced into the intra-hepatic biliary tree. The CDS tract is then dilated sufficiently to accommodate the intended stent delivery system. Many different stents have been described for drainage in this setting, most commonly 7F to 10F plastic double-pigtail biliary stents, partially or fully covered biliary SEMSs, and lumen-apposing SEMSs. Straight plastic biliary stents may pose a higher risk for migration, and uncovered SEMSs pose a higher risk for bile leakage and hence are not preferred. Partially covered stents like Hybrid stents or Giobor stents are preferred in this condition.

### **EUS-GUIDED TRANS-GASTRIC BILIARY ACCESS [EUS-HGS]**

An alternative to EUS-CDS for EUS-guided biliary drainage (EUS-BD) is the creation and stenting of a hepatico-gastrostomy. The left intra-hepatic biliary tree is accessed with a 19G needle via the gastric cardia or body; avoidance of very peripheral ducts may reduce the risk for bile leakage. After needle cholangiography, a guidewire is then advanced either into the contralateral (right) intrahepatic biliary tree or distally into, or through, the extrahepatic bile duct. After appropriate dilation of the hepatico-gastrostomy tract, stent placement is performed, typically using either long plastic biliary stents or a partially covered SEMS.

### **EUS-GUIDED GALL BLADDER DRAINAGE [EUS-GBD]**

EUS-guided gallbladder drainage (EUS-GBD) has been reported using both trans-antral and trans-duodenal approaches, with drainage attained using naso-biliary drains, double-pigtail plastic stents, covered SEMSs, and lumen-apposing SEMSs. The indication for the vast

majority of EUS-GBD procedures is acute cholecystitis in patients unsuitable for surgery. A variety of management approaches has been described, including using EUS-GBD as a bridge to surgery, leaving stents in indefinitely, and routine removal of stents after clinical resolution of cholecystitis and fistula maturation.<sup>14</sup>

## CONCLUSION

EUS-biliary drainage using SEMS as primary drainage has high technical success rate, low accident rate, and long stent patency period. In cases of duodenal stenosis where ERCP is considered difficult, a high success rate is seen, and EUS-BD is considered an effective method. EUS-CDS as the primary drainage for distal CBD obstruction especially in advanced unresectable pancreatic cancer should be considered useful.

## BIBLIOGRAPHY

1. Viale A, Pettazoni P, Lyssiotis CA, et al. Oncogene ablation-resistant pancreatic cancer cells depend on mitochondrial function. *Nature* 2014; 514: 628–32.
2. Whittle MC, Izeradjene K, Rani PG, et al. RUNX3 controls a metastatic switch in pancreatic ductal adenocarcinoma. *Cell* 2015; 161: 1345–60.
3. Boj SF, Hwang CI, Baker LA, et al. Organoid models of human and mouse ductal pancreatic cancer. *Cell* 2015; 160: 324–38.
4. De La Cruz MS, Young AP, Ruffin MT. Diagnosis and management of pancreatic cancer. *Am Fam Physician* 2014; 89: 626–32.
5. Enochsson L, Swahn F, Arnelo U, et al. Nationwide, population-based data from 11,074 ERCP procedures from the Swedish registry for gallstone surgery and ERCP. *Gastrointest Endosc* 2010; 72: 1175–84, 1184. e1–3.
6. Giovannini M, Moutardier V, Pesenti C, et al. Endoscopic ultrasound-guided bilio-duodenal anastomosis: A new technique for biliary drainage. *Endoscopy* 2001; 33: 898–900.
7. Dhindsa BS, Mashiana HS, Dhaliwal A, Mohan BP, Jayaraj M, Sayles H, et al. EUS-guided biliary drainage: A systematic review and meta-analysis. *Endosc Ultrasound* 2020; 9: 101–9.
8. Wang K, Zhu J, Xing L, et al. Assessment of efficacy and safety of EUS guided biliary drainage: a systematic review. *GIE* 2016; 83: 1218–27.
9. Venkatachalapathy S, Nayar MK. Therapeutic endoscopic ultrasound (Review). *Frontline Gastroenterology* 2017; 8: 119–123.
10. Maple JT, Pannala R, Abu Dayyeh B et al. Interventional EUS (with videos) (Status Evaluation report by ASGE TECHNOLOGY COMMITTEE. *Gastrointest Endosc* 2017; 85: 465–81.
11. Park DH, Jeong SU, Lee BU, et al. Prospective evaluation of a treatment algorithm with enhanced guidewire manipulation protocol for EUS-guided biliary drainage after drainage after failed ERCP (with video). *Gastrointest Endosc* 2013; 78: 91–101.
12. Weilert F, Binmoeller K, Marson F, et al. Endoscopic ultrasound guided antegrade treatment of biliary stones following gastric bypass. *Endoscopy* 2011; 43: 1105–8.
13. Park DH, Jang JW, Lee SS, et al. EUS-guided transhepatic antegrade balloon dilation for benign bilio-enteric anastomotic strictures in a patient with hepatico-jejunostomy. *Gastrointest Endosc* 2012; 75: 692–3.
14. Choi J-H, Lee SS. Endoscopic ultrasonography-guided gallbladder drainage for acute cholecystitis: from evidence to practice. *Dig Endosc.* 2014; 27: 1–7.

# Sinus of Valsalva Aneurysm – 3D Trans Esophageal Echocardiography to the rescue.

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## ABSTRACT

Sinus of Valsalva (SOV) aneurysms are rare congenital abnormalities which can present as an acute cardiac emergency following rupture. We present a case of SOV aneurysm communicating with the cardiac chambers that was initially missed by other imaging modalities. The case highlights the role of 3D trans-esophageal echocardiography (TEE) in the evaluation of this pathology.

## KEY WORDS

Sinus of Valsalva Aneurysm, 3D TEE.

## CASE HISTORY

A 70-year old male presented with chest discomfort on exertion for the last 15 days. He had no antecedent history of similar complaints and no co-morbidity. His physical examination was unremarkable. The transthoracic echocardiographic (TTE) examination revealed an intact Sinus of Valsalva (SOV) aneurysm (5.6 cm x 5.6 cm) arising from the non-coronary sinus accompanied with a moderate tricuspid regurgitation (TR). Similar findings were confirmed on computed tomography. His coronary angiogram was normal. In view of the above findings, he was scheduled for SOV repair.

Intraoperative two-dimensional TEE revealed a SOV aneurysm with a normally functioning aortic valve. The right heart structures were dilated and there was a moderate TR but the defect could not be delineated. Three-dimensional (3D) TEE revealed a small defect in the aneurysmal sac. Two dimensional Colour Flow Doppler (CFD) confirmed the communication between the aneurysmal sac and the right atrium. Patient underwent SOV aneurysm patch repair with closure of communication and a tricuspid valve annuloplasty (#26 MM RING CONTOUR 3D). His post-operative course was uneventful.

## DISCUSSION

SOV aneurysms are rare congenital anomalies secondary to aortic wall weakness at the junction of annulus fibrosa and the aortic media at any of the 3 cusps.<sup>1</sup> The commonest site of origin is the right coronary sinus with

rupture into any of the right sided-cardiac chambers. A ruptured SOV aneurysm presents as heart failure which may be accompanied by a sharp retrosternal chest pain. The physical examination reveals a wide pulse pressure with a continuous murmur over the precordium.<sup>2,3</sup>

Preoperative TTE revealed an intact aneurysm. Intraoperatively, TEE initially revealed an intact aneurysmal sac (**Fig 1**). However, the presence of a moderate TR accompanied with dilated right heart chambers raised suspicion about a probable communication. On further evaluation with 3 D TEE a small defect was found in aneurysmal sac (**Fig 2 & 3**). Two dimensional CFD confirmed this finding which would have been missed due to the TR jet (**Fig 4**). This highlights the importance of 3D-TEE in the evaluation of SOV aneurysm. The presence of a tear in the SOV aneurysm changed the surgical management of the case in that the communication had to be closed along with the repair of the aneurysm.



Fig 1 – 2D-Transesophageal echocardiogram in the Mid-esophageal 5 chamber view demonstrating an intact aneurysmal sac.

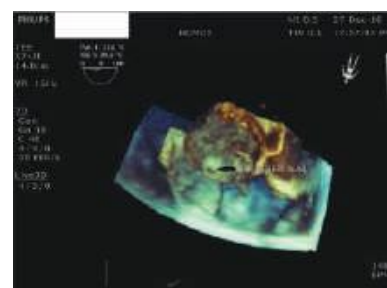


Fig 2 – 3D-Transesophageal echocardiogram view from the aortic side revealing a small defect in the aneurysmal sac.

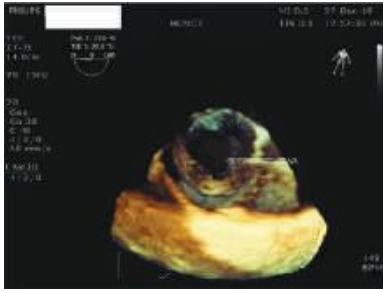


Fig 3 – 3D-Transesophageal echocardiogram view from the right atrial side revealing a small defect in the aneurysmal sac.

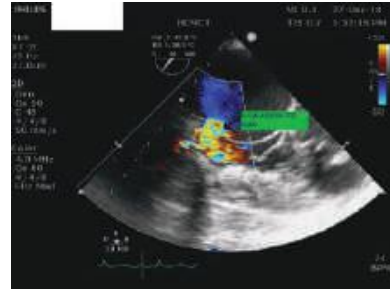


Fig 4 – 2D-Transesophageal echocardiogram in the Mid-esophageal 5 chamber view demonstrating flow into the right atrium through the defect.

## REFERENCES

1. Chua JH, Methangkool E, Cha CM, Mahajan A. The use of real-time three-dimensional transesophageal echocardiography for percutaneous closure of a ruptured sinus of valsalva aneurysm. *J Cardiothorac Vasc Anesth.* 2014; 28: e4–6.
2. Golzari M, Riebman JB. Ruptured sinus of Valsalva aneurysms-A diagnostic dilemma: 625. *Crit Care Med.* 2004; 32: A176.
3. McGregor PC, Temtanikitpaisan Y, Hiltbolt A, Aragam JR. A spectrum of sinus of Valsalva aneurysm-From the young to the old. *Echocardiography.* 2017; 34: 1524-30.

# Anterior Superior Iliac Spine (ASIS) Avulsion Fracture in an Adult: A Case Report

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## INTRODUCTION

Of all pelvic ring fractures, iliac spine fractures represent 4% and more frequently young people with open growth physis are affected. These lesions are usually the consequence of sudden and forceful contraction of the muscles that take their origin on these structures<sup>1</sup>. These fractures occur from apophyses until their fusion with the corresponding pelvic tuberosities. They occur at the cartilaginous plate of the apophysis<sup>2</sup>. During this period, apophyses are the weakness zone where strong muscles are inserted<sup>3</sup>. Such sudden and forceful contractions of the muscle occur during sporting activities in a skeletally immature individual. The most involved sports are football, athletics, skating and gymnastics<sup>4</sup>. Several cases of avulsion fractures of the anterior superior iliac spine (ASIS) are described in the literature with the majority of the cases involving children or teenagers practicing sport<sup>5</sup>. Very rare cases have been reported in adults<sup>6</sup>. We have not come across any studies where ASIS avulsion fractures have occurred as a result of road traffic accident. Hereby we report a case of avulsion fracture of Anterior Superior Iliac Spine (ASIS) in a 24 year old male as a result of road traffic accident.

## CASE REPORT

A 24 year old male patient, manual worker by occupation, presented to the emergency with history of road traffic accident. The patient sustained an injury to the left lower abdomen and left hip. The patient did not complain of any signs of head injury. The chief complaint of the patient was pain over his left hip and inability to raise his left lower limb. On examination there was tenderness which was localized around the anterior superior iliac spine. The movements of the hip joint were painful and restricted. The patient did not have any neurovascular deficit. The patient was haemodynamically stable. Radiographic studies were conducted and the patient was found to have an avulsion fracture of left anterior superior iliac spine. (**Fig. 1**) The patient was prepared for surgery after all routine investigations were normal and pre anaesthetic evaluation was completed. The patient was operated on day 2 of his injury.



Fig. 1: Pre-operative pelvis with both hips x-ray showing Avulsion fracture of ASIS.

## SURGICAL TECHNIQUE

The procedure was performed under spinal anaesthesia. The patient was placed in supine position and the anterolateral pelvis and thigh was scrubbed, painted and draped. A vertical 3 cm skin incision was made below and just lateral to the ASIS. The fascia was divided longitudinally while taking care to protect the lateral femoral cutaneous nerve. This allowed entry into the hematoma cavity and palpation of the bony fragment distally. The origins of the Sartorius muscle and a sleeve of tensor fascia lata remained attached to the bony fragment. Another sleeve of tensor fascia lata was found to be avulsed without any attached bony fragment and had migrated distally. The bone fragment could be re approximated to the avulsion site and was fixed with the help of a partial threaded 4mm cancellous screw. The other sleeve of tensor fascia lata was pulled proximally into the surgical site and fixed to the bone with help of ethibond suture passed through the iliac wing. The wound was washed and closed in layers.

## POST-OPERATIVE PERIOD

The patient was given adequate post-operative antibiotic cover and physiotherapy with the goal to maintain range of motion, to prevent secondary complication and to mobilize the patient out of bed. The patient was started with ankle toe movements, heel slide, abduction/adduction of hip, dynamic quadriceps in high sitting position and ambulation with walker with toe touch weight bearing on the first post-operative day. Post-operative radiograph was done which showed proper screw placement with anatomical reduction. (**Fig. 2.**) The sutures were removed at 2 weeks post-surgery.

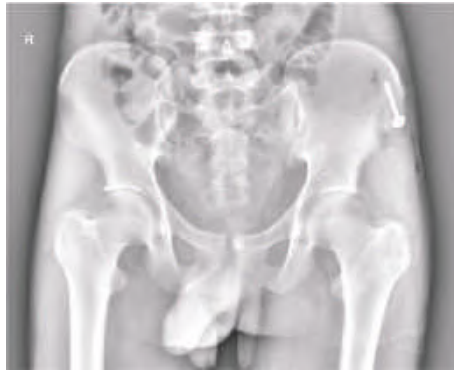


Fig. 2: Post-operative pelvis with both hips x-ray showing anatomical reduction of fracture and implant in situ.



Fig.4: 6 month follow up xray of pelvis with both hips.

The functional outcome of the patient was assessed using Majeed grading of pelvic fractures<sup>7</sup>. **(Fig.3.)**

Pain – 30 points		Standing – 36 points	
Intense, continuous at rest	0-5	<b>A Walking aids (12)</b>	
Intense with activity	10	Bedridden or almost	0-2
Tolerable, but limits activity	15	Wheelchair	4
With moderate activity, abolished by rest	20	Two crutches	6
Mild, intermittent, normal activity	25	Two sticks	8
Slight, occasional or no pain	30	One stick	10
		No sticks	12
		<b>B Gait unaided (12)</b>	
<b>Work – 20 points</b>		Cannot walk or almost	0-2
No regular work	0-4	Shuffling small steps	4
Light work	8	Gross limp	6
Change of job	12	Moderate limp	8
Same job, reduced performance	16	Slight limp	10
Same job, same performance	20	Normal	12
		<b>C Walking distance (12)</b>	
<b>Sitting – 10 points</b>		Bedridden or few metres	0-2
Painful	0-4	Very limited time and distance	4
Painful if prolonged or awkward	6	Limited with sticks, difficult without	6
Uncomfortable	8	prolonged standing possible	8
Free	10	One hour with a stick limited without	10
		One hour without sticks slight pain or limp	12
		Normal for age and general condition	12
<b>Sexual intercourse – 4 points</b>			
Painful	0-1		
Painful if prolonged or awkward	2		
Uncomfortable	3		
Free	4		

Fig. 3: System for assessment after pelvic fractures.

A score above 85 was considered an excellent result. In the immediate post-operative period the patient complained of intense pain with activity and was able to mobilize using a walker for a very limited time and distance. At 3 months follow up, the patient only complained of mild intermittent pain and was able to resume light work. He was slightly uncomfortable while sitting and used one stick for ambulation with a slight limp. He had a good outcome score of 72 as per the scoring system.

At 6 months follow up, the patient did not complain of any pain and returned to his old job. He was able to walk unassisted with a normal gait with an excellent outcome score of 94 as per the scoring system. Radiograph at 6 months follow up showed complete union at the fracture site. **(Fig.4.)**

## DISCUSSION

Two muscles take their origin at the ASIS: the Sartorius and the Tensor Fascia Lata. Both these muscles are bi-articular muscles. They cross over the hip and knee joints and they end at the tibia<sup>8</sup>. As a result they produce movements at both hip and knee joint. So a non-anatomic reduction produces weakness of the movements caused by these muscles.

There is no established guideline for the management of avulsion fractures of anterior superior iliac spine in adults. In adolescents it has been found that a delay in treatment of the avulsion fracture of the ASIS can cause painful non-union, limited sports performance, and even long-term disability<sup>9</sup>. Severely displaced fragments may also lead to compression of the lateral cutaneous nerve causing meralgia paraesthetica<sup>10, 11</sup>.

In our case the history of trauma, clinical examination, and standard radiographs was sufficient for a correct diagnosis. The avulsed fragment was displaced distally and laterally. We opted for a surgical approach to anatomically reduce the fracture which resulted in early patient mobilization, faster return to activity, reduced chances of non-union and weakness of muscle. These factors might be an advantage over non-operative management for such fractures.

## REFERENCES

1. F. Pogliacomi, F. Calderazzi, M. Paterlini, F. Ceccarelli. *Acta Biomed.* 2014; 85 (2): 52-58.
2. I.Beneddouch, B.B.Jean-Luc, S.Poiraudeau, A.Nysa; Anterior superior iliac spine avulsion in a young soccer player. *Annals of Physical and Rehabilitation Medicine.* 2010; 53 (9): 584-590.
3. Willinger L, Schanda JE, Lorenz S, Imhoff AB, Buchmann S; Surgical treatment of two adolescent athletes with dislocated avulsion fracture of the anterior superior iliac spine (ASIS). *Arch Orthop Trauma Surg.* 2017; 137: 173-177.
4. Poor AE, Warren A, Cannon N, Meyers WC. Surgical Treatment of a Young Athlete with Displaced Avulsion Fracture of the Anterior Superior Iliac Spine (ASIS). *Int J Sports Exerc Med.* 2019; 5:127.
5. M.J. Lambert, D.J. Fligner. Avulsion of the iliac crest apophysis: a rare fracture in adolescent athletes. *Ann Emerg Med*
6. S. Orava, L. Ala-Ketola. Avulsion fractures in athletes. *Br J Sports Med.* 1977; 11(2): 65-71.
7. S.A. Majeed. Grading the outcome of pelvic fractures. *J bone Joint Surg [Br].* 1989; 71 (B): 304-6.
8. H. Pointinger, P. Munk, G.P. Poeschl. Avulsion fracture of the anterior superior iliac spine following apophysitis. *Br J Sports Med.* 2003; 37(4): 361-362.
9. Naylor JA, Goffar SL, Chugg J. Avulsion fracture of the anterior superior iliac spine. *J Orthop Sports Phys Ther.* 2013; 43: 195.
10. Hayashi S, Nishiyama T, Fujishiro T, Kanzaki N, Kurosaka M. Avulsion-fracture of the anterior superior iliac spine with meralgia paresthetica: A case report. *J Orthop Surg (Hong Kong).* 2011; 19: 384-385.

# A Rare Case of Abdominoperineal Fistula Arising From Episiotomy Scar Presenting as a Non-Healing Sinus

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## INTRODUCTION

Incidence of non-healing sinus and perianal fistulas have been noted in post-delivery patients in case of a perineal tears<sup>1,4</sup>. But most of these cases were sutured easily with the help of surgical team. There is no case reported of such a complex high and branching fistula leading to the abdominal wall. A multidisciplinary approach taking the help of the surgical team helped cure the patient who is presently pregnant with her second baby.<sup>5</sup>

## CASE REPORT

Patient a 29 year old pleasant lady visited Gynae OPD with complaint of discharge and pain from episiotomy scar since delivery which was 6 months back. She had a re suturing after 2 months of delivery followed by leaking sinus after a few days. On examination there was a small opening in the centre of the 2 cm old right sided episiotomy scar with mild induration. Decision for re-suturing was taken. In operation theatre on opening up the scar a diagnosis of sinus tract going towards anal canal was made which was not detected earlier. The sinus was just adjacent to the anal opening at 11'o clock position in the anal mucosa. Surgeon was called and Seton sutures applied for the tract extending upto anal canal. Episiotomy was sutured and patient discharged after two days. Her Seton sutures were removed after 1 week in the surgery OPD.

Patient was well for 1 month, unfortunately she returned to the Gynae OPD with similar discharge which was more troublesome than before. Contrast MRI fistulogram was planned which showed fistulas tract in 3 directions from episiotomy scar. Decision for reexploration was taken and to be left for secondary healing. In OT tracing the tract using methylene blue via feeding tube done. 3 Tracts seen – one going towards anal tract at 11' o clock, second going towards right perineal area at 8' o clock position and third tract kept extending towards the right vaginal wall adjacent to the pubic bone. This was not detected on fistulogram. On probing with fistula probe it extended till the lower abdominal wall just above the pubic symphysis on the right side.

Decision for opening the tract and keeping the abdominal wound open was taken. There were high chances of bowel injury at such area but careful approach with identification with dye made the procedure complication free. All the wounds were kept open for secondary healing. Tracts were freshened, scrapped and cleaned with hydrogen peroxide. Packing of the abdominal wound done using roller gauze after cleaning the fistulous tract with hydrogen peroxide. Patient explained the cleaning, dressing and hygiene part and sent home.

## POST OP CARE

Patient was called for dressing on alternate days followed by twice a week. She was advised perineal care and sitz bath. Small frequent debridement and dilute Hydrogen peroxide wash with Neosporin ointment dressing was done under local anaesthesia. In 1 month the sinus going towards abdomen started to close. Just abdominal wound packing and perineal local dressing was done and patient was recovered completely in two months.

## DISCUSSION

These fistulas have been addressed by multiple names all over the literature as perineo-vaginal fistulas/ perineal fistulas/ perianal fistulas/ low fistula in ano. But one thing common among them is their development in the episiotomy scar after delivery and complaining of chronic suppuration and discharge.<sup>2</sup> It usually becomes chronic, healing on taking antibiotics and coming back again after some time. The risk factors for such cases are 3rd and 4th degree perineal tears, inflammatory bowel disease, tuberculosis, pelvic infection and preceding perianal disease that compromise tissue healing. This was an uncommon case and on review of literature, none has been reported where the fistula extended till the abdominal cavity. Many patients suffer in silence. Affected women suffer from incontinence, foul discharge, pain, dyspareunia, social isolation, suppuration, shame and depression.



## CONCLUSION

Any lesion or sinus arising from the episiotomy site should be investigated further with fistulous tract in mind.<sup>3</sup> Any non-healing lesion with sinus opening should be operated after a fistulogram study. Methylene blue test should be done intra-operatively. However, some sinuses can be missed on fistulogram, especially in complex fistulas and help of surgical team should be taken for complicated fistulas.

### **Compliance with Ethical Standards:**

**Conflict Of Interest:** None

**Informed consent for case publication taken from patient.**

## REFERENCES

1. Kemal Beksac, Mert Turgal, Derman Basaran, Omer Aran, and M. Sinan Beksac, Vagino-perineal Fistula as a Complication of Perianal Surgery in a Patient with Sjögren's Syndrome: A Case Report, Hindawi. 2014. Article ID 359605, <http://doi.org/10.1155/2014/359605>
2. D. Howard, J. O. L. DeLancey, and R. E. Burney. "Fistula-in-ano after episiotomy," *Obstetrics and Gynaecology*. 1999; 93(5): 800–802, 1999.
3. C. Lefevre, E. A. Ereksan, S. Hoffstetter, and M. McLennan. "Fistula-in-ano: an uncommon cause of chronic vulvar symptoms," *Obstetrics and Gynaecology*. 2010; 115(2): 421–423.
4. Ashwath Narayan Ramji. "Vaginocutaneous fistula: unreported, under-reported or unheralded?". *Int J Reprod Contracept Obstet Gynecol*. 2019 Jul; 8(7): 2932–2936.
5. Gowi Dorairajan, Himabindu "Chronic non-healing sinus manifestation in episiotomy scar: hidden fistula-in-ano" *Int Urogynaecol J*. 2014; 25(10): 1441–3.

# Role of early anomaly NT scan & Diagnosis of Acrania-exencephaly-anencephaly sequence

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## ABSTRACT

Nuchal translucency (NT) measurement between 11 and 14 weeks' gestation is a reliable marker for chromosomal abnormalities, including trisomy 21. However, even if conventional karyotyping is normal, increased NT has predictive value of adverse pregnancy outcome, because it is associated with several fetal malformations, congenital heart defects, genetic syndromes, intrauterine death and miscarriages. The majority of these structural anomalies are undetectable before birth. The risk is proportional to the nuchal translucency thickness, in fact it statistically increases after measurement reaching 3.5 mm or more. Regular screening at 11-13 weeks for NT scan has significantly increased diagnosis of multiple congenital anomalies.

## OBJECTIVE

First trimester ultrasound diagnosis of congenital anomalies like acrania and exencephaly at routine NT scanning. The introduction of first trimester nuchal translucency measurement has resulted in earlier identification of fetuses with exencephaly. Exencephaly is an uncommon congenital malformation in which the flat bones of calvaria are absent leaving the brain completely exposed or protrudes through the defect in the cranial vault. Anencephaly may ensue as a result of prolonged exposure of the developing encephalon to amniotic fluid and trauma in utero.

## INTRODUCTION

In the first trimester of pregnancy there is a subcutaneous collection of fluid in the fetal neck that is visualized by ultrasonography as a nuchal translucency (NT). The measurement should be made between 11 and 14 weeks but the best performance is obtained at 11-12 weeks. Normally NT thickness increases with fetal crown-rump length (CRL), in fact at a CRL of 45 mm is between 1.2 and 2.1 mm and at a CRL of 84 mm is 1.9 and 2.7 mm (median and 95th percentile values). The 99th percentile is about 3.5 mm. The measurement has to be performed by qualified ultrasonologists.

## EPIDEMIOLOGY

The acrania-anencephaly sequence begins with acrania, which is the most common anomaly affecting the central nervous system with an incidence of ~1:1000 pregnancies.

## CASE

The patient came for regular early anomaly screening and NT NB scan at 12.4 weeks, CRL concurred with 12.1 weeks. NT thickness was increased. Fetal cranium was absent and brain appeared as an irregular mass. A diagnosis of acrania-exencephaly was made.

## CONCLUSION

Regular NT screening ultrasound demonstrated the increased NT with absent cranium and exposed brain (exencephaly) very well.

## PATHOLOGY AND CLINICAL-DESCRIPTION

The abnormality occurs at the beginning of the fourth week of gestation when the anterior neuropore closes. The normal migration of mesenchymal tissue which is supposed to form the cranium does not occur. The overlying ectoderm remains the only covering as a thin amnion-like membrane. The calvarium, muscles of the scalp and the dura are not formed. In the absence of induction from the neurocranium, the cerebral tissue fails to differentiate into two hemispheres.

Acrania exposes the brain to the amniotic fluid with a risk of friction with the uterine wall, placenta and fetal parts; this condition is called exencephaly. In this circumstance, the unprotected brain tissue undergoes progressive destruction and degeneration due to mechanical and chemical trauma, leading to complete or almost complete disappearance of the brain from 14 weeks' gestation onward. The damaged brain tissue can be seen on ultrasound as echogenic particles in the amniotic fluid.



Image 1: Single live foetus with CRL of 54.4mm (Corresponding to 12 weeks 1 day gestation)



Image 2: Increased Nuchal translucency (NT) thickness in foetus at 12 weeks 1 day gestation.



Image 3 and 4: Acrania and exencephaly at 12 weeks 1 day gestation. (Sagittal transabdominal US images of the fetal head show an absent cranial vault and an amorphous mass of neural tissue. The facial structures and orbits are present).

## DISCUSSION

First trimester early anomaly NT scan is a well-established examination during routine obstetric practice. The examination has the potential to identify embryo-fetal defects in pregnant women who are at increased risk of congenital anomalies. The use of a standardized protocol in the ultrasonographic assessment of the embryo-fetal anatomy is fundamental for the early prenatal diagnosis of fetal abnormalities. Combining abdominal and transvaginal ultrasonography can be extremely helpful in improving the diagnostic accuracy.

Acrania represents the first stage of this maldevelopment sequence that takes place 18–20 days post-fertilization and the progression from exencephaly to anencephaly was first described by Wilkings et al. When acrania is seen at an early stage, disorganized brain tissue (vasculo-membranous area) is detectable above the orbits, a process called exencephaly. Anencephaly evolves as a result of failed closure of the midbrain and forebrain, but with normal fusion at the level of the hindbrain and the cervical cord region. It has been demonstrated that about 12–25% of these cases have other associated structural anomalies, with 1–5% being aneuploidy.

## REFERENCES

1. Roberta De Domenico, Marianna Faraci, Entela Hyseni, Fosca A. F. Di Prima, Oriana Valenti, Santo Monte, Elsa Giorgio, Eliana Renda. Increased nuchal translucency in normal karyotype fetuses. *J Prenat Med.* 2011 Apr-Jun; 5(2): 23-26.
2. Katherine W. Fong, Ants Toi, Shia Salem, Lisa K. Hornberger, David Chitayat, Sarah J. Keating, Fionnuala McAuliffe, Jo-Ann Johnson. Detection of Fetal Structural Abnormalities with US during Early Pregnancy. *Radiographics.* 2004; 24(1): 157-74.
3. Kuah AC, Lee SL, Tan LK, Tan HK. First trimester ultrasound diagnosis of exencephaly. Paper presented at the 13th World Congress in Fetal Medicine 2014.
4. Praveen Jha. Exencephaly. *Radiopedia* Jan 2013.
5. Henry Knipe, Rupesh Namdev et al. Acrania anencephaly sequence. *Radiopedia.* Jan 2014.

# Misdiagnosing Epilepsy: A Case Report on Stokes-Adams Syndrome

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## INTRODUCTION

Epilepsy is a common neurological disorder prevalent among 7 out of 1000 people in general population<sup>1</sup>. An epileptic seizure occurs due abnormally excessive or synchronous neuronal activity in the brain manifesting in a transient occurrence of signs and/or symptoms. Fundamentally, it is a disorder of the brain characterized by an enduring predisposition to generate epileptic seizures<sup>2</sup>, which can vary from brief and nearly undetectable to long periods of vigorous shaking<sup>3</sup>. In epilepsy, seizures tend to recur, and have no immediate underlying cause<sup>4</sup>. However, seizures that occur due to a specific cause are not deemed to represent epilepsy<sup>2</sup>. Before determining whether paroxysmal events represent an epileptic disorder, one must consider 2 alternatives: (a) non-epileptic events mimicking epileptic seizures and (b) true epileptic seizures caused by a non-neurological condition. However, many cardiovascular disorders may cause blackouts, complicated by abnormal movements due to generalized cerebral hypoxia, which may appear similar to epileptic seizures, leading to an incorrect diagnosis of epilepsy<sup>5</sup>. We report a patient with a complete atrioventricular (AV) block presenting with misleading symptoms suggesting seizure.

## CASE REPORT

A 76-year-old, male patient was received at home, where he was found lying on the floor, conscious and talking. The patient last remembered working on his computer when he suddenly felt dizzy and didn't remember anything thereafter. The vital signs measured at home were: Blood Pressure 110/70 mm Hg, Blood sugar via finger stick test: 279 mg/dl. While talking to the patient, he again had an episode of generalized tonic-clonic seizure lasting a couple of seconds, following which patient regained consciousness and had no post-ictal confusion. Patient was immediately put on a Cardiac Monitor and one large bore i.v cannula placed in the left antecubital vein. Repeat vital signs were: Heart Rate (HR) 36/min, respiratory rate 10/min, Blood Pressure 80/60 mm Hg. Thereafter, patient again had an episode of generalized seizure lasting a couple of seconds. Subsequently he regained consciousness. In view of unstable bradycardia, Injection Atropine 0.6mg i.v bolus pushed.

The patient was put into the ambulance for shifting him to the hospital, while pacing pads were placed over the chest and injection Midazolam 2 mg i.v bolus and injection Phenytoin 1 gm iv loading dose, was administered. Patient continued seizing, with decreased level of consciousness without regaining consciousness this time. External cardiac pacing on demand mode (30/70) was started.

Patient had no history of trauma, headache, fever, chills, diplopia, dysarthria, dyspnea, orthopnea, chest pain or tightness, tinnitus, or hearing impairment. He had a history of Diabetes Mellitus Type 2, not taking any regular medication. Prior to this episode he was active, doing all routine activities. Patient was shifted to the Emergency Room for further evaluation.

## PHYSICAL EXAMINATION

On being shifted to the hospital, patient had poor general condition.

### Primary Survey:

Airway: Compromised,  
Breathing: Labored,  
Circulation: Peripheral,  
Pulses: Weak

### Systemic Examination:

HEENT: No significant abnormality detected, pupils were equal and reactive to light.

CHEST: Lungs were clear, bilateral air entry was equal with vesicular breath sounds.

CVS: Auscultation of the heart revealed a normal S1 and S2 without murmur or gallop.

ABDOMEN: Abdominal examination was unremarkable.

CNS: Altered sensorium, Agitated, GCS- E1V2M3- 6/15.

Extremities: cold peripheries.

## INVESTIGATIONS

Laboratory findings were as follows: Complete blood count (CBC): within normal limits. Renal Profile: sodium 133 mEq/L, potassium 4.7 mEq/L, bicarbonate 16.8mEq/L, glucose 229 mg/dL, blood urea 29.8 mg/dL. Cardiac biomarkers (CPK, CPK-MB, Troponin I) were within normal limits. There were no remarkable findings

on chest radiography. 12 lead ECG showed ventricle paced rhythm with Right Bundle Branch Block, Heart Rate: 86/min, pacing spikes seen. **(Fig 1)**

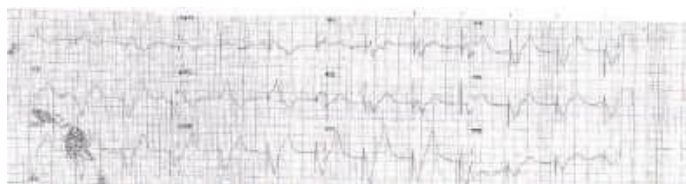


Fig 1: 12 lead ECG with Right Bundle Branch Block with Pacing Spikes

## MANAGEMENT

Patient was continued on transcutaneous pacing. Post external pacing, vital signs were: Heart Rate: 74/min, Blood Pressure: 124/60 mmHg, Respiratory Rate: 20/min, SpO2: 100%, Temperature: 98.30 F. In view of low Glasgow Coma Scale (GCS) and risk of aspiration patient was intubated and mechanically ventilated. Cardiology and Neurology consultation taken. Patient was then shifted to Cath Lab for temporary pacemaker implantation, was planned for Permanent Pacemaker and Coronary Angiography, and was transferred to the Cardiac Care Unit for further monitoring and stabilization. Trans-thoracic Echo Doppler reported an akinetic posterior wall, distal IVS, distal lateral wall, distal anterior wall and mid basal inferior wall. Left Ventricular Ejection Fraction (LVEF)-40%. Dilated LV (6.5/5.4cm) & LA (4.9cm), tethering of PML, moderate to severe Mitral Regurgitation.

Coronary Angiography reported Triple Vessel Disease. Carotid Doppler USG reported bilateral lateral CCA showing diffuse irregular plaques not causing any significant narrowing/ hemodynamic abnormality. **(Fig 2)**

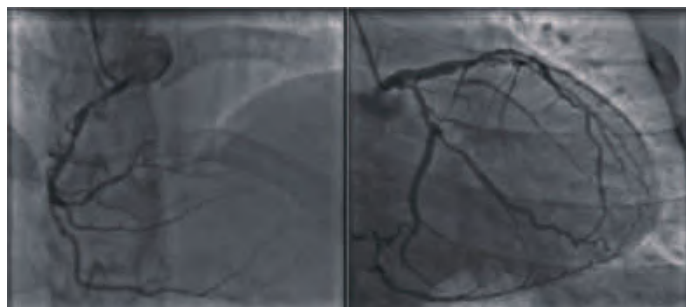


Fig 2: Coronary Angiography showing Triple Vessel Disease  
(Produced with permission of the hospital and patient)

2<sup>nd</sup> day of hospitalization, patient was extubated, maintained all vital signs and was neurologically intact. Patient was advised for an early Coronary Artery By-Pass Grafting (CABG) with Mitral Valve Replacement and further follow up in the Cardiology Out Patient Department. Unfortunately, patient as per his preference wanted to be shifted to another center.

Patient was discharged on Day 5 from our hospital with temporary pacemaker in situ. **(Fig 3)**

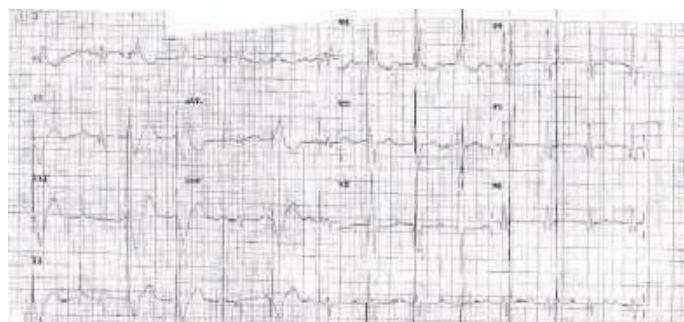


Fig 3: ECG at Discharge

## DISCUSSION

In this case, the tonic-clonic activity was confusing, as the symptoms could be a “seizure” or a “syncope”. Syncope is a symptom, defined as a transient, self-limited loss of consciousness with a relatively rapid onset and usually leading to fall; the subsequent recovery is spontaneous, complete, and usually prompt. The underlying mechanism is a transient global cerebral hypo perfusion. Seizure is synonymous with an epileptic fit, which is the manifestation of a paroxysmal discharge of abnormal rhythms in some part of the brain<sup>6</sup>.

There is an increasing recognition of the problem of misdiagnosis of epilepsy. The extent of the problem remains unclear, but it is estimated that approximately 20% of the patients do not have epilepsy<sup>7</sup>.

Stokes-Adams syndrome, named after two Irish physicians- Robert Adams (1791-1875) and William Stokes (1804-1877), is defined as a sudden, transient episode of syncope, occasionally featuring seizures especially when cerebral perfusion is diminished for a prolonged period of time because of arrhythmias like complete heart block, ventricular fibrillation and pulseless ventricular tachycardia<sup>8,9,10</sup>.

Syncope, complicated by involuntary movements, such as myoclonus or myoclonic jerks, is not an uncommon event, and has been reported in 12% of blood donors<sup>11</sup>, and in 38 (90%) of 42 syncopal episodes among 56 patients were provoked by a combination of hyperventilation, orthostatic and a Valsalva maneuver<sup>12</sup>. Tilt induced vasovagal syncope, which is associated with periods of asystole<sup>13,14</sup>, resulted in abnormal movements in 64% of tilt-positive patients in this study. In a study by, Grubb et al<sup>15</sup>, on 15 patients with recurrent, unexplained seizure-like episodes, who were unresponsive to anticonvulsant medication syncope with tonic-clonic seizure like activity was seen in 10 patients (67%). After cardiac drug or device therapy, all 10 patients were tilt-negative and free from seizure-like episodes.

Thus, it is very important for Emergency Physicians to understand the difference between a seizure and a syncope and be on the watch for cardiovascular syncope, as misdiagnosing these seizure-like symptoms can be life threatening. An episode of convulsive seizure lasting for a few seconds with spontaneous recovery (regaining consciousness with no post ictal confusion phase), most-likely implies syncope and less-likely seizure<sup>15</sup>. All patients should have subsequent 12 lead ECG<sup>16</sup> and continuous cardiac monitoring or Holter monitoring, which should commence from the Emergency Department itself. Missing a cardiac arrhythmia could be fatal and in addition, patients may be inappropriately treated with potentially harmful anticonvulsant drugs<sup>5</sup>.

Various rhythms have been reported in the course of Stoke Adams Syndrome like complete atrioventricular (AV) block, ventricular tachycardia, ventricular fibrillations and one of the rarest is standstill of the ventricle as an episode during normal rhythm<sup>17</sup>. As an Emergency Physician, one should be aware of uncommon manifestations.

There are specific and sensitive test for the diagnosis of epilepsy—namely, video telemetry monitoring with electroencephalography—but this may not be widely available or practical in patients with infrequent attacks<sup>7</sup>.

Emergency Department clinicians should be familiar with any automatic gain in their ECG machine as tachycardia interpreted as narrow complex tachycardia can actually be atrial activity that had been amplified by the automatic gain to look like small amplitude QRS complexes<sup>5</sup>.

In this case, the uncontrolled diabetes mellitus, Coronary Angiography report suggesting a Triple Vessel Disease with moderate to severe Mitral Regurgitation could be a cause of the patient leading to a complete heart block and thus presenting as syncope.

As per telephonic conversation with the patient, he had a Permanent Pacemaker Implantation, was again advised Coronary Artery Bypass Graft with Mitral Valve Replacement. Patient refused for any intervention. At present is doing well and has not had such episodes again.

## CONCLUSION

This case report points to the difficulty one faces in confusing seizure with syncope and vice versa during diagnosis. However, a good and accurate clinical history is most important in reaching a correct conclusion. Simple noninvasive cardiovascular evaluation can help diagnosing cardiovascular syncope. Hence, reinforcing the importance of differentiating one from the other, recognizing repeated, convulsive syncope's, without provocation, are suggestive of cardiac syncope.

Patients can present with Stokes Adams attack with a normal sinus rhythm or any other rhythm disturbance as well. Such patients should have a cardiac evaluation before discharge and stress should be laid on noninvasive cardiovascular evaluation such as Holter ECG monitoring.

This case report emphasizes the importance of recognition of cardiac syncope and differentiating the above from a seizure in a busy ED, especially for the young aspiring EM physicians and trainees and have a broad approach to common presentations in the ED which can sometimes be misleading.

**COMPETING INTERESTS:** The authors declare that they have no competing interests.

## CONSENT

As the case report was formulated after the patient had already left the hospital, written informed consent was not taken. Although, as per telephonic conversation with the patient and his wife, verbal permission to document the case for pure academic purpose and to extract relevant information from the patient's treatment file, was granted to the authors.

## REFERENCES

1. Blume, 2003 Blume WT. Diagnosis and management of epilepsy. CMAJ 2003; 168: 441-8.
2. Fisher R, van Emde Boas W, Blume W, Elger C, Genton P, Lee P, Engel J. "Epileptic seizures and epilepsy: definitions proposed by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE)". *Epilepsia* 2005; 46(4): 470-2. doi:10.1111/j.0013-9580.2005.66104.x. PMID 15816939.
3. "Epilepsy". Fact Sheets. World Health Organization. October 2012. Retrieved January 24, 2013.
4. Chang BS, Lowenstein DH (2003). "Epilepsy". *N. Engl. J. Med.* 349 (13): 1257-66. doi:10.1056/NEJMra022308. PMID 1450795
5. Chi-Fang You, Chee-Fah Chong, Tzong-Luen Wang, Tzu-Yao Hung , Chien-Chih Chen "Unrecognized paroxysmal ventricular standstill masquerading as epilepsy: a Stokes-Adams attack" Article reçu le 31 Janvier 2007, accepté le 26 Mars 2007.
6. Brignole M, Alboni P, Benditt D, et al. Task force report. Guidelines on management (diagnosis and treatment) of syncope. *Eur Heart J* 2001; 22: 1256-1306.
7. Zaidi et al 2000 Zaidi A, Clough P, Cooper P, et al. Misdiagnosis of epilepsy: many seizure-like attacks have a cardiovascular cause. *J Am Coll Cardiol* 2000; 36: 181-4.

8. R. Adams. Cases of Diseases of the Heart, Accompanied with Pathological Observations. Dublin Hospital Reports, 1827, 4: 353–453.
9. W. Stokes. Observations on some cases of permanently slow pulse. Dublin Quarterly Journal of Medical Science, 1846; 2: 73–85.
10. Acharya S, Shukla S, Rathi N, Mahajan SN. Seizures in malaria- a pointer to cerebral malaria or an unusual drug-related complication. Indian Journal of Medical Specialties, 2013; 4(1):103-106.
11. Lin et al 1982 Lin JT, Ziegler DK, Lai CW, et al. Convulsive syncope in blood donors. Ann Neurol 1982; 11: 525-8.
12. Lempert T, Bauer M, Schmidt D. Syncope: a videometric analysis of 56 episodes of transient cerebral hypoxia. Ann Neurol 1994; 36: 233-7.
13. Milstein S, Buetikofer J, Lesser J, et al. Cardiac asystole: a manifestation of neurally mediated hypotension-bradycardia. J Am Coll Cardiol 1989; 14: 1626–32.
14. Fitzpatrick AP, Sutton R. Blood pressure and heart rate during positive and negative 60° head-up tilt testing. Eur J Card Pac Electrophysiol 1991; 1: 25–30.
15. Grubb BP, Gerard G, Roush K, et al. Differentiation of convulsive syncope and epilepsy with head-up tilt testing. Ann Intern Med 1991; 115: 871–6.
16. Hick, 1954 Hick FK. Stokes-Adams seizures; case report of paroxysmal ventricular standstill and its production by carotid sinus pressure. Circulation 1954; 9: 857-9.
17. Harold Cookson. Paroxysmal Ventricular Standstill. Br Heart J 1952; 14: 350–356 doi: 10.1136/hrt.14.3.350.

# Carcinoma Lung presenting as Perianal Abscess

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## ABSTRACT

We describe a 62-year male, diagnosed as metastatic adenocarcinoma lung with metastasis to peri-rectal subcutaneous tissue. The patient presented with perianal abscess which was drained. PET CT findings, clinical picture and histology were confusing suggesting the possibility of two synchronous primaries – (1) lung primary with mediastinal and cervical lymph nodal metastasis, (2) Peri-rectal sebaceous carcinoma with inguinal nodal metastases. To confirm the diagnosis, slide and block review and pathologic markers was done on the peri-rectal biopsy, which confirmed the primary in lung with metastases to peri-anal region. This case underlines the importance of detailed immunohistochemistry (IHC) work-up on histopathology specimen for the diagnosis of such cases with unusual presentation.

## BACKGROUND

Lung cancer is leading cause of cancer related deaths worldwide<sup>1</sup>. In India, lung cancer is fourth most common cancer and fourth most common cause of death reported in India<sup>2</sup>. Lung cancer presenting as anal metastases is extremely rare. We report a case of lung cancer presenting as perianal abscess.

## CASE REPORT

62 years old man presented with pain and swelling in perianal region. Magnetic Resonance Imaging (MRI) fistulogram was s/o perianal abscess, underwent incision and drainage. Post drainage histopathology was suggestive of poorly differentiated carcinoma, possibly sebaceous cell carcinoma. PET-CT (Positron Emission Tomography) scan (**Fig. 1**) was done as a part of metastatic work-up, which showed metabolically active right lung lesion with right cervical, and mediastinal lymph nodal metastasis and metabolically active soft tissue lesion in right side of perineum with metabolically active bilateral inguinal nodes. PET CT findings, clinical picture and histology suggested the possibility of two synchronous primaries – (1) lung primary with mediastinal and cervical lymph nodal metastasis, (2) Peri-rectal sebaceous carcinoma with inguinal nodal metastases. To confirm the diagnosis,

slide and block review and pathologic markers was done on the peri-rectal biopsy, which showed Thyroid transcription factor 1 (TTF-1) Positive and programmed death ligand 1 (PDL1) positive with Foundation test. BRAF/MET/ROS1/EGFR were negative. IHC findings confirmed the lung as primary with metastasis to peri-rectal subcutaneous tissue. He was thus diagnosed as metastatic adenocarcinoma lung and started on systemic chemotherapy.

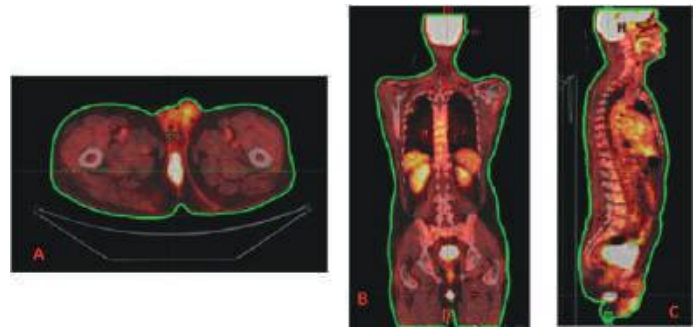


Fig. 1: PET-CT showing peri-anal abscess (A) with a lung lesion (B)

PET-CT post chemotherapy showed decrease in size and uptake of primary lung, mediastinal and cervical Lymph nodes and resolution of perineal soft tissue deposit and right inguinal LN- suggestive of partial response. Maintenance chemo was started. PET-CT (**Fig. 2**), post maintenance chemotherapy showed increase in size of right Level IA LN. No significant change lung lesion. The overall impression suggested progressive disease. He had severe pain and difficulty in swallowing for which he received palliative RT to the metastatic cervical lymph nodes. Post treatment patient was relieved of his symptoms. The disease was stable in last follow up done in July 2020. Patient is on maintenance chemotherapy.

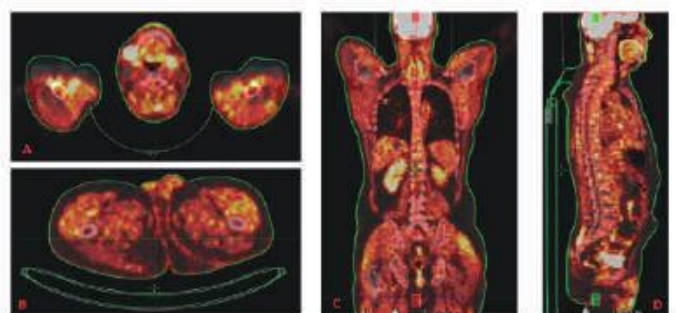


Fig. 2: Post maintenance chemo PET-CT. A- metastases to right submandibular region, B- resolution of peri-anal abscess, C- Decrease in size of lung metastases.



## DISCUSSION

Non-small cell lung Cancer (NSCLC) represent 85-90% of lung cancer. Adenocarcinoma accounts for 40% of NSCLC. Most of the NSCLC are metastatic at time of diagnosis<sup>3</sup>. The most common site of metastases is contralateral lung, liver, adrenals and brain<sup>4</sup>. Incidence of GI metastases is 11.9% from autopsy studies<sup>5</sup>. Lung cancer presenting as anal metastases is extremely rare. Only seven cases have been reported so far<sup>6</sup>. When presented with histology of undifferentiated tumour IHC becomes an important modality for diagnosis of lung cancer<sup>7</sup>.

Perianal abscess is a common surgical problem, caused by infection of anal glands, usually diagnosed on physical examination but imaging may be useful to know the extent of abscess. Since the tumours of perianal region is rare, it can be easily missed leading to delay in diagnosis and treatment of primary.

NSCLC with peri anal metastases are managed with single or combined chemotherapy or immunotherapy along with palliative radiotherapy. Nevertheless, the overall prognosis is poor. Current evidence from various case reports suggest that patient with perianal abscess may be misdiagnosed and patient with NSCLC or other cancers should be evaluated for metastatic disease.

This case underlines the importance of detailed IHC work-up on histopathology specimen for the diagnosis of cases with unusual presentation, and highlights the overall aggressive nature of disease in such cases.

## REFERENCES

1. Torre LA, Bray F, Siegel RL, et al. Global cancer statistics, 2012. *CA Cancer J Clin*. 2015; 65: 87.
2. <http://cancerindia.org.in/globocan-2018-india-factsheet/> (last accessed 21/07/2020)
3. Deffebach ME, Humphrey L. Lung cancer screening. *Surgical Clinics*. 2015; 95(5): 967-78.
4. Line DH, Deeley TJ. The necropsy findings in carcinoma of the bronchus. *Br J Dis Chest*. 1971; 65: 238-242.
5. Yoshimoto A, Kasahara K, Kawashima A. Gastrointestinal metastases from primary lung cancer. *Eur J Cancer*. 2006; 42: 3157-60.
6. Dhandapani RG, Anosike C, Ganguly A. Non-small cell lung carcinoma metastasis to the anus. *BMJ Case Rep*. 2016; 29: bcr2016214653.
7. Rossi G, Marchioni A, Romagnani E et al. Primary lung cancer presenting with gastrointestinal tract involvement: clinico-pathologic and immunohistochemical features in a series of 18 consecutive cases. *J Thorac Oncol*. 2007; 2: 115-20.

# Communicating Respectfully with the Oncology Patient

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## INTRODUCTION

Oncology is a science and an art in equal measure. Among all medical specialities, oncology is the one requiring diligent communication skills. This is especially in view of the sensitive nature of the disease, the existing social stigma, prevalent complex multimodality treatment approaches and financial implications<sup>1</sup>. Health care professionals working in the field of oncology need to interact with colleagues, residents, senior faculty and hospital administrators. But most importantly, they need to interact with the oncology patients. There is an implicit connection between what the physician says and the patient perceptions of care, respect, and assurance<sup>2</sup>. Positive and negative communication acts performed by healthcare providers during cancer diagnosis or treatment phases can have a significant bearing on the mutual relationship and can even affect cancer care<sup>2</sup>.

Some isolated attempts have been made to address this pivotal issue<sup>3,4</sup>. However, no clear instruction or guideline exists as to how healthcare providers should talk, behave and prepare themselves while interacting with oncology patient. This article attempts to propose a set of terms and etiquettes that healthcare professionals would do well to follow during interaction with their patients in their busy oncology practice.

## BEFORE SEEING THE PATIENT IN CLINIC (OPD) - PREASSESSMENT

1. Be aware of the patient's, name, age, occupation and overall disease status.
2. Go through the reports of the patient before meeting the patient so that less time is spent in doing this with the patient sitting in front of you in the OPD. Prepare a mental checklist of unclear portions of the patient's clinical history or management course, to be asked at appropriate time.
3. Set all the hard copies of reports/scans in chronological order, if the same has not been already done
4. It is also a good practice to have all the written notes ready on file/online (only sections of examination and advice may be left to be filled after seeing the patient). Writing each and every detail while the

patient is in the OPD room (while simultaneously talking to the patient) can be a challenging task.

5. Once done, be ready to welcome the patient to your consultation room, showing appropriate dignity.

## DURING MEETING THE PATIENT IN CLINIC (OPD) - ASSESSMENT

1. Invite the patient to the OPD room by his or her name and greet the patient. Getting up from the chair to welcome an elderly patient is appropriate and conveys respect.
2. Begin by asking about general issues to the patient (the patient's residence, family, about how the accompanying persons are related to the patient, what he/she ate in the morning)
3. Start with the general aspects of patient's illness. Slowly focus to the areas specifically unclear to you from the patient's history and investigations.
4. Refrain from criticising past treatments or past opinions. Statements like "That doctor has treated you incorrectly, that treatment was not required, I would have treated it in this manner, that hospital is ill equipped ..." are better avoided. While a treatment or a treatment sequence may seem wrong to you, you still are not aware of a) the patient's physical condition at that previous time point b) verbal communication between the patient and the health care giver at that point of time c) A report or a test that influenced the past decision (and has been missed by you in the pile of papers)
5. Take permission from the patient before asking them to move to the examination couch
6. Ensure the presence of a lady hospital staff/nurse (if a male doctor is examining any female patient) and vice versa
7. Explain that present day oncology management is likely to be a multimodality care process and the overall management could take some time. Give a reasonable time frame about overall treatment to the patient
8. Refrain from the (unscientific) temptation of telling exact survival times to oncology patients. (e.g. "you are going to live for 15 months") It is more appropriate

to begin by telling them about inform them about that fact that survival would be dependent on response to therapy (e.g. “we shall be doing a response assessment scan after 3 months and then take it further”). In the event that the patient and his family are very keen to know about survival, it is more appropriate to state in a manner like “Patients with conditions like these generally survival for 12-15 months, in your individual case, this could be more or sometimes less, depending on the response to treatment....”

9. Discuss all the pros/cons/side effects of the treatment modality being planned and mention alternative treatments, if any. Try to give percentages of the benefits and risk of side effects whenever possible and document the same in your prescription.
10. Explain the likely costs of upcoming treatment modality (surgery/ radiotherapy/ chemotherapy/ targeted therapy). This is especially important since this can be a significant worry for a recently diagnosed patient. Guide the patient about equally effective, lesser costly options.
11. Provide a written prescription to the patient with your physical/digital signatures
12. Repeat all the advice from you verbally as well as in writing in the prescription, with a clear timeline and sequence of the advised investigations/cross referrals and the next date of visit.
13. Ask the patient and the attendants if they have any pending questions or queries before they finally leave your OPD

#### **AFTER THE PATIENT LEAVES YOUR OPD ROOM- POST ASSESSMENT**

1. Ensure that all the reports/scans of the patient have been taken by him/her. Inform the patient/ attendants immediately if any report or scan/film is found in the OPD area
2. Ensure that all notes in the system are saved and uploaded (in a digital environment)
3. In case any new information is brought to your notice in next few hours or days that has the potential to alter patient’s clinical care, it is important to call and ask the patient to visit your clinic again.

**Declarations of interest:** None

**Funding received:** None

#### **REFERENCES**

1. Moore PM, Rivera S, Bravo-Soto GA, Olivares C, Lawrie TA. Communication skills training for healthcare professionals working with people who have cancer. *Cochrane Database Syst Rev.* 2018; Jul 24: 7
2. Epstein RM, Duberstein PR, Fenton JJ, Fiscella K, Hoerger M, Tancredi DJ. Effect of a Patient- Centered Communication Intervention on Oncologist-Patient Communication, Quality of Life, and Health Care Utilization in Advanced Cancer: The VOICE Randomized Clinical Trial. *JAMA Oncol.* 2017; 3: 92-100
3. Visser LNC, Schepers S, Tollenaar MS, de Haes HCJM, Smets EMA. Patients' and oncologists' views on how oncologists may best address patients' emotions during consultations: An interview study. *Patient Educ Couns.* 2018; 101: 1223-1231.
4. Essig S, Steiner C, Kuehni CE, Weber H, Kiss A. Improving Communication in Adolescent Cancer Care: A Multiperspective Study. *Pediatr Blood Cancer.* 2016; 63: 1423-30.

# Blue Rubber Bleb Nevus Syndrome (BRBNS)

■ Sufla Saxena

Pediatric Gastroenterologist, Manipal Hospital, Dwarka



Image 1 & 2: Multiple cutaneous & GI rubbery hemangiomatous lesions

## BRIEF HISTORY

10 year old Iraqi girl presented to Pediatric Gastroenterology OPD with severe anemia due to GI bleed. H/o repeated transfusions in the past. She had multiple cutaneous & GI hemangiomas (from esophagus to rectum). She underwent Endoscopic Argon Plasma Coagulation (APC) through upper GI endoscopy, enteroscopy and colonoscopy in multiple sittings and all the lesions were successfully treated.

# Radiation Colitis

■ Kunal Das

Consultant and Head, Dept of Gastrosiences, Manipal Hospital, Dwarka

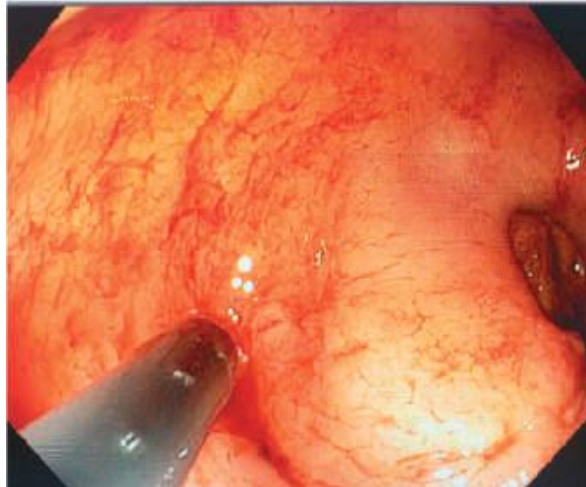


Fig 1 (a) Radiation colitis – Pre-treatment



Fig 1 (b) Radiation colitis – After-treatment with 4% Formalin instillation

## CASE REPORT

Mrs SJ, a 65 year old woman, presented with 6 month history of intermittent rectal bleeding. She was diagnosed as cervical cancer 1.5 yrs ago, and underwent hysterectomy with bilateral oophorectomy and received radiation for the same. Grade 4 rectal bleeding began 12 months after completion of radiation therapy. In the last 3 months, she has received 16-17 units of blood. Her haemoglobin has ranged from 4.8gm/dl to 8.6 mg/dl. She had undergone colonoscopy at an outside hospital and was diagnosed as a case of Radiation Proctitis. She received 4 sessions of Colonoscopy assisted Argon Plasma Coagulation (APC) of the rectal mucosa in the last 4 months without much benefit. She then receive an episode of 4% Formalin instillation after she stopped bleeding

■ Kunal Das

Consultant and Head, Dept of Gastrosiences, Manipal Hospital, Dwarka

## 1. Dexamethasone in Hospitalized Patients with Covid-19 – Preliminary Report

RECOVERY Collaborative Group; Peter Horby, Wei Shen Lim, Jonathan R Emberson, Marion Mafham, Jennifer L Bell, Louise Linsell, Natalie Staplin, Christopher Brightling, Andrew Ustianowski, Einas Elmahi, Benjamin Prudon, Christopher Green, Timothy Felton, David Chadwick, Kanchan Rege, Christopher Fegan, Lucy C Chappell, Saul N Faust, Thomas Jaki, Katie Jeffery, Alan Montgomery, Kathryn Rowan, Edmund Juszczak, J Kenneth Baillie, Richard Haynes, Martin J Landray

**N Engl J Med 2020 Jul 17. doi: 10.1056/NEJMoa2021436. Online ahead of print.**

**Background:** Coronavirus disease 2019 (Covid-19) is associated with diffuse lung damage. Glucocorticoids may modulate inflammation-mediated lung injury & thereby reduce progression to respiratory failure & death.

**Methods:** In this controlled, open-label trial comparing a range of possible treatments in patients who were hospitalized with Covid-19, we randomly assigned patients to receive oral or intravenous dexamethasone (at a dose of 6 mg once daily) for up to 10 days or to receive usual care alone. The primary outcome was 28-day mortality. Here, we report the preliminary results of this comparison.

**Results:** A total of 2104 patients were assigned to receive dexamethasone and 4321 to receive usual care. Overall, 482 patients (22.9%) in the dexamethasone group & 1110 patients (25.7%) in the usual care group died within 28 days after randomization (age-adjusted rate ratio, 0.83; 95% CI, 0.75 to 0.93;  $P < 0.001$ ). The proportional & absolute between-group differences in mortality varied considerably according to the level of respiratory support that the patients were receiving at the time of randomization. In the dexamethasone group, the incidence of death was lower than that in the usual care group among patients receiving invasive mechanical ventilation (29.3% vs. 41.4%; rate ratio, 0.64; 95% CI, 0.51 to 0.81) & among those receiving oxygen without invasive mechanical ventilation (23.3% vs. 26.2%; rate ratio, 0.82; 95% CI, 0.72 to 0.94) but not among those who were receiving no respiratory support at randomization (17.8% vs. 14.0%; rate ratio, 1.19; 95% CI, 0.91 to 1.55).

**Conclusions:** In patients hospitalized with Covid-19, the use of dexamethasone resulted in lower 28-day

mortality among those who were receiving either invasive mechanical ventilation or oxygen alone at randomization but not among those receiving no respiratory support.

## 2. Detection of renal cell carcinoma using plasma and urine cell-free DNA methylomes

Pier Vitale Nuzzo, Jacob E. Berchuck, Matthew L. Freedman

**Nature Medicine 26 2020: 1041-43**

### Abstract

Improving early cancer detection has the potential to substantially reduce cancer-related mortality. Cell-free methylated DNA immunoprecipitation and high-throughput sequencing (cfMeDIP-seq) is a highly sensitive assay capable of detecting early-stage tumors. We report accurate classification of patients across all stages of renal cell carcinoma (RCC) in plasma (area under the receiver operating characteristic (AUROC) curve of 0.99) and demonstrate the validity of this assay to identify patients with RCC using urine cell-free DNA (cfDNA; AUROC of 0.86).

## 3. Timing of Endoscopy for Acute Upper Gastrointestinal Bleeding

James Y.W. Lau, Yuanyuan Yu, Raymond S.Y. Tang, Heyson C.H. Chan, Hon-Chi Yip, Shannon M. Chan, Sally W.Y. Luk, Sunny H. Wong, Louis H.S. Lau, Rashid N. Lui, Ting T. Chan, Joyce W.Y. Mak, et al.

**N Engl J Med 2020 Apr 2; 382(14): 1299-1308**

### Abstract

**Background:** It is recommended that patients with acute upper gastrointestinal bleeding undergo endoscopy within 24 hours after gastroenterologic consultation. The role of endoscopy performed within time frames shorter than 24 hours has not been adequately defined.

**Methods:** To evaluate whether urgent endoscopy improves outcomes in patients predicted to be at high risk for further bleeding or death, we randomly assigned patients with overt signs of acute upper gastrointestinal bleeding and a Glasgow-Blatchford score of 12 or higher (scores range from 0 to 23, with higher scores indicating a higher risk of further bleeding or death) to undergo endoscopy within 6 hours (urgent-endoscopy group) or between 6 and 24 hours (early-endoscopy group) after gastroenterologic consultation. The primary end

point was death from any cause within 30 days after randomization.

**Results:** A total of 516 patients were enrolled. The 30-day mortality was 8.9% (23 of 258 patients) in the urgent-endoscopy group and 6.6% (17 of 258) in the early-endoscopy group (difference, 2.3 percentage points; 95% confidence interval [CI], -2.3 to 6.9). Further bleeding within 30 days occurred in 28 patients (10.9%) in the urgent-endoscopy group and in 20 (7.8%) in the early-endoscopy group (difference, 3.1 percentage points; 95% CI, -1.9 to 8.1). Ulcers with active bleeding or visible vessels were found on initial endoscopy in 105 of the 158 patients (66.4%) with peptic ulcers in the urgent-endoscopy group and in 76 of 159 (47.8%) in the early-endoscopy group. Endoscopic hemostatic treatment was administered at initial endoscopy for 155 patients (60.1%) in the urgent-endoscopy group and for 125 (48.4%) in the early-endoscopy group.

**Conclusions:** In patients with acute upper gastrointestinal bleeding who were at high risk for further bleeding or death, endoscopy performed within 6 hours after gastroenterologic consultation was not associated with lower 30-day mortality than endoscopy performed between 6 and 24 hours after consultation.

#### 4. Two Phase 3 Trials of Inclisiran in Patients with Elevated LDL Cholesterol (ORION10 & 11)

Kausik K. Ray, R. Scott Wright, David Kallend, Wolfgang Koenig, Lawrence A. Leiter, Frederick J. Raal, Jenna A. Bisch, Tara Richardson, Mark Jaros, Peter L.J. Wijngaard, and John J.P. Kastelein, for the ORION-10 and ORION-11 Investigators

##### Abstract

**Background:** Inclisiran inhibits hepatic synthesis of proprotein convertase subtilisin-kexin type 9. Previous studies suggest that inclisiran might provide sustained reductions in low-density lipoprotein (LDL) cholesterol levels with infrequent dosing.

**Methods:** We enrolled patients with atherosclerotic cardiovascular disease (ORION-10 trial) and patients with atherosclerotic cardiovascular disease or an atherosclerotic cardiovascular disease risk equivalent (ORION-11 trial) who had elevated LDL cholesterol levels despite receiving statin therapy at the maximum tolerated dose. Patients were randomly assigned in a 1:1 ratio to receive either inclisiran (284 mg) or placebo, administered by subcutaneous injection on day 1, day 90, and every 6 months thereafter over a period of 540 days. The co-primary end points in each trial were the placebo-corrected percentage change in LDL cholesterol level from baseline to day 510 and the time-adjusted percentage change in LDL cholesterol level from baseline after day 90 and up to day 540.

**Results:** A total of 1561 and 1617 patients underwent randomization in the ORION-10 and ORION-11 trials, respectively. Mean ( $\pm$ SD) LDL cholesterol levels at baseline were 104.7 $\pm$ 38.3 mg per deciliter (2.71 $\pm$ 0.99 mmol per liter) and 105.5 $\pm$ 39.1 mg per deciliter (2.73 $\pm$ 1.01 mmol per liter), respectively. At day 510, inclisiran reduced LDL cholesterol levels by 52.3% (95% confidence interval [CI], 48.8 to 55.7) in the ORION-10 trial and by 49.9% (95% CI, 46.6 to 53.1) in the ORION-11 trial, with corresponding time-adjusted reductions of 53.8% (95% CI, 51.3 to 56.2) and 49.2% (95% CI, 46.8 to 51.6) ( $P$ <0.001 for all comparisons vs. placebo). Adverse events were generally similar in the inclisiran and placebo groups in each trial, although injection-site adverse events were more frequent with inclisiran than with placebo (2.6% vs. 0.9% in the ORION-10 trial and 4.7% vs. 0.5% in the ORION-11 trial); such reactions were generally mild, and none were severe or persistent.

**Conclusions:** Reductions in LDL cholesterol levels of approximately 50% were obtained with inclisiran, administered subcutaneously every 6 months. More injection-site adverse events occurred with inclisiran than with placebo. (Funded by the Medicines Company; ORION-10 and ORION-11 ClinicalTrials.gov numbers, NCT03399370. opens in new tab and NCT03400800. opens in new tab.)

#### 5. Safety and immunogenicity of the ChAdOx1 nCoV-19 vaccine against SARS-CoV-2: a preliminary report of a phase 1/2, single-blind, randomised controlled trial

Pedro M Folegatti, Katie J Ewer, Parvinder K Aley, Brian Angus, Stephan Becker, Sandra Belij-Rammerstorfer, Duncan Bellamy, Sagida Bibi, Mustapha Bittaye, Elizabeth A Clutterbuck, Christina Dold, Saul N Faust, Adam Finn, Amy L Flaxman, Bassam Hallis, Paul Heath, Daniel Jenkin, Rajeka Lazarus, Rebecca Makinson, Angela M Minassian, Katrina M Pollock, Maheshi Ramasamy, Hannah Robinson, Matthew Snape, Richard Tarrant, Merryn Voysey, Catherine Green, Alexander D Douglas, Adrian V S Hill, Teresa Lambe, Sarah C Gilbert, Andrew J Pollard, on behalf of the Oxford COVID Vaccine Trial Group†

**Published Online:** July 20, 2020; <https://doi.org/10.1016/> LANCET 2020; S0140-6736(20)31604-4

##### Summary

**Background:** The pandemic of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) might be curtailed by vaccination. We assessed the safety, reactogenicity, and immunogenicity of a viral vectored coronavirus vaccine that expresses the spike protein of SARS-CoV-2.

**Methods:** We did a phase 1/2, single-blind, randomized controlled trial in five trial sites in the UK of a chimpanzee adenovirus-vectored vaccine (ChAdOx1 nCoV-19) expressing the SARS-CoV-2 spike protein compared with a meningococcal conjugate vaccine (Men ACWY) as control. Healthy adults aged 18–55 years with no history of laboratory confirmed SARS-CoV-2 infection or of COVID-19-like symptoms were randomly assigned (1:1) to receive ChAdOx1 nCoV-19 at a dose of  $5 \times 10^{10}$  viral particles or Men ACWY as a single intramuscular injection. A protocol amendment in two of the five sites allowed prophylactic paracetamol to be administered before vaccination. Ten participants assigned to a non-randomized, unblinded ChAdOx1 nCoV-19 prime-boost group received a two-dose schedule, with the booster vaccine administered 28 days after the first dose. Humoral responses at baseline and following vaccination were assessed using a standardized total IgG ELISA against trimeric SARS-CoV-2 spike protein, a multiplexed immunoassay, three live SARS-CoV-2 neutralization assays (a 50% plaque reduction neutralization assay [PRNT50]; a microneutralisation assay [MNA50, MNA80, and MNA90]; and Marburg VN), and a pseudovirus neutralization assay. Cellular responses were assessed using an ex-vivo interferon- $\gamma$  enzyme-linked immunospot assay. The co-primary outcomes are to assess efficacy, as measured by cases of symptomatic virologically confirmed COVID-19, and safety, as measured by the occurrence of serious adverse events. Analyses were done by group allocation in participants who received the vaccine. Safety was assessed over 28 days after vaccination. Here, we report the preliminary findings on safety, reactogenicity, and cellular and humoral immune responses. The study is ongoing, and was registered at ISRCTN, 15281137, and ClinicalTrials.gov, NCT04324606.

**Results:** Between April 23 and May 21, 2020, 1077 participants were enrolled and assigned to receive either ChAdOx1 nCoV-19 (n=543) or Men ACWY (n=534), ten of whom were enrolled in the non-randomized ChAdOx1 nCoV-19 prime-boost group. Local and systemic reactions were more common in the ChAdOx1 nCoV-19 group and many were reduced by use of prophylactic paracetamol, including pain, feeling feverish, chills, muscle ache, headache, and malaise (all  $p < 0.05$ ). There were no serious adverse events related to ChAdOx1 nCoV-19. In the ChAdOx1 nCoV-19 group, spike-specific T-cell responses peaked on day 14 (median 856 spot-forming cells per million peripheral blood mononuclear cells, IQR 493–1802; n=43). Anti-spike IgG responses rose by day 28 (median 157 ELISA units [EU], 96–317; n=127), and were boosted following a second dose (639 EU, 360–792; n=10). Neutralizing antibody responses against SARS-CoV-2 were detected in 32 (91%) of 35 participants after a single dose when measured in MNA80 and in 35

(100%) participants when measured in PRNT50. After a booster dose, all participants had neutralizing activity (nine of nine in MNA80 at day 42 and ten of ten in Marburg VN on day 56). Neutralizing antibody responses correlated strongly with antibody levels measured by ELISA ( $R^2 = 0.67$  by Marburg VN;  $p < 0.001$ ).

**Interpretation:** ChAdOx1 nCoV-19 showed an acceptable safety profile, and homologous boosting increased antibody responses. These results, together with the induction of both humoral and cellular immune responses, support large scale evaluation of this candidate vaccine in an ongoing phase 3 programme.

## 6. Young Children's Use of Smartphones and Tablets

Jenny S. Radesky, Heidi M. Weeks, Rosa Ball, BA Alexandria Schaller, Samantha Yeo, Joke Durnez, Matthew Tamayo-Rios, Mollie Epstein, Heather Kirkorian, Sarah Coyne, Rachel Barr.

**Pediatrics. 2020; 146(1): e20193518**

**Background and Objectives:** Child mobile device use is increasingly prevalent, but research is abstract limited by parent-report survey methods that may not capture the complex ways devices are used. We aimed to implement mobile device sampling, a set of novel methods for objectively measuring child mobile device use.

**Methods:** We recruited 346 English-speaking parents and guardians of children aged 3 to 5 years to take part in a prospective cohort study of child media use. All interactions with participants were through e-mail, online surveys, and mobile device sampling; we used a passive-sensing application (Chronicle) in Android devices and screenshots of the battery feature in iOS devices. Baseline data were analysed to describe usage behaviours and compare sampling output with parent-reported duration of use.

**Results:** The sample comprised 126 Android users (35 tablets, 91 smartphones) and 220 iOS users (143 tablets, 77 smartphones); 35.0% of children had their own device. The most commonly used applications were YouTube, YouTube Kids, Internet browser, quick search or Siri, and streaming video services. Average daily usage among the 121 children with their own device was 115.3 minutes/day (SD 115.1; range 0.20–632.5) and was similar between Android and iOS devices. Compared with mobile device sampling output, most parents underestimated (35.7%) or overestimated (34.8%) their child's use.

**Conclusions:** Mobile device sampling is an unobtrusive and accurate method for assessing mobile device use. Parent-reported duration of mobile device use in young children has low accuracy, and use of objective measures is needed in future research.



# RECENT ADVANCES IN HEALTHCARE

■ Sanjay Gogoi

Consultant & HOD, Urology and Renal Transplant, Manipal Hospital, Dwarka

## 1. da Vinci Single Port Robot



In 2000, the **da Vinci Surgery System** broke new ground by becoming the first robotic surgery system approved by the FDA for general laparoscopic surgery. Over the past 2 decades more than 5500 robots have been installed globally and every 26 seconds, a surgeon starts a da Vinci procedure. By 2019, over 7.2 million robotic surgical procedures have been carried out in over 67 countries.



Most recent launch from Intuitive is the **da Vinci SP**. It is a single-port robotic system that makes single-port surgery possible in a user-friendly manner. This is a novel robotic system with four arms that deploy within the body from one 2.5-cm trocar, as opposed to four separate incisions for each arm with prior da Vinci robotic systems. The camera angle can be changed without the need to exchange lenses. Moreover, from a single port placement, up to 360° of vision is possible, enabling easy visualization of relevant anatomy.

FDA initially cleared **da Vinci SP** system for urologic procedures in May 2018. Experience from the Mayo clinic has shown that this innovation has further shortened the operative time and over 95 % of patients are leaving the hospital the next day after a radical prostatectomy.

Transoral otolaryngology procedures represent the second category of procedures the FDA has cleared for the da Vinci SP surgical system. This would permit ENT surgeons to perform single port approach for lateral

oropharyngectomy procedures (commonly referred to as radical tonsillectomy) and tongue base resection, thereby preventing the morbidity of an open approach.

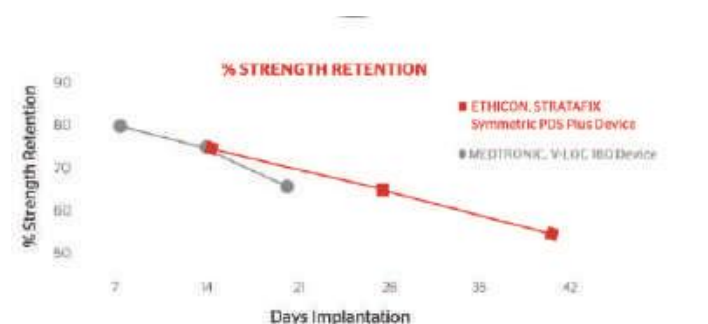
Even several benign gynaecological procedures like hysterectomy, myomectomy, sacrocolpopexy have been successfully carried out thereby proving the feasibility and safety.

Laparoscopic single port surgery failed to be globally accepted due to a very steep learning curve, non-intuitive motions and limited optics. **Da Vinci SP** with its advanced technologies, has enabled performance of single port surgeries safely with less morbidity and it is likely to be well accepted by globally and set new benchmarks in minimally invasive surgery.

## 2. STRATAFIX Symmetric PDS Plus Knotless Tissue Control Device

Following any open surgical procedure, the significance of a good wound repair is not unknown to a surgeon. A strong fascial closure is critical for preventing wound complication during healing. Despite best efforts, Dehiscence occur in up to 35%, surgical site infection is seen in 19% and incisional hernia occurs in about 23% of midline incisions.

STRATAFIX is a barbed PDS suture with exceptional strength needed to close high-tension areas as fascia. It offers up to 6 weeks of extended wound holding support. This is the only barbed suture which is approved for fascial closure. The other barbed suture, V-Loc (Medtronic) includes a warning against use in fascia.



In an effort to reduce Surgical site Infections, WHO, CDC (2017) and American College of Surgeons (2016) have recommended use of antibacterial coated sutures. Since Stratafix is coated with Triclosan (an antibacterial and anti-fungal agent), it helps to prevent surgical site infection.



proteolytic cleavage of ADC leading to the release of MMAE into the cytoplasm.

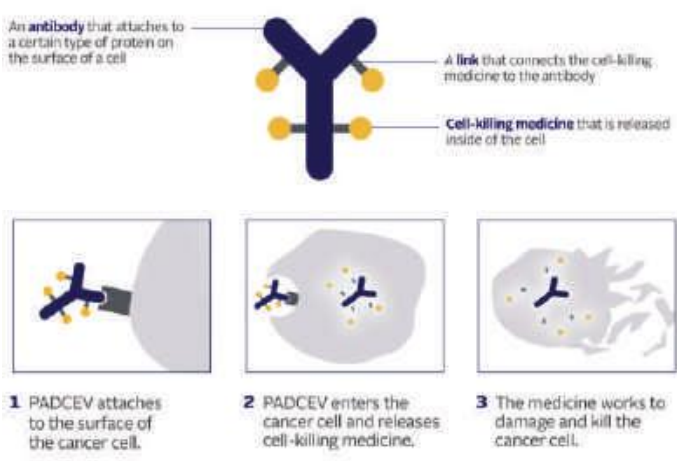
Once MMAE is released in the cytoplasm, it targets the vinca alkaloid sites on tubulin which thereby induce depolymerisation of mitotic spindle. Depolarisation leads to cell cycle arrest at the G2/M phase thereby preventing tumor cell proliferation and inducing tumor regression through apoptosis.

The results of the Pivotal trial was published in October 2019. In 125 patients with metastatic urothelial tumors, previously treated with platinum chemotherapy and anti-PD-1/L1 therapy, the confirmed Objective Response rate was 44%, including 12% complete responses. **(Jonathan et al, J Clin Oncol 2019 Oct).**

### 3. Enfortumab Vedotin (PADCEV): Targeted therapy in bladder cancer

Advanced bladder cancer is a dreadful disease. Chemotherapy with platinum-based regimes remains the mainstay of either neoadjuvant or adjuvant treatment. The 5 year survival in cases with regional node involvement is about 35% and in the presence of distant metastasis it's about 5%. Targeted therapies are being developed, to be used either as a single agent or in combination with chemotherapy.

Enfortumab vedotin is a human IgG1 monoclonal antibody-drug conjugate (ADC) that has been recently used in bladder cancer. It comprises of an antibody, targeted to a cell surface protein Nectin-4, and monomethyl-auristatin-E (MMAE), a microtubule disrupting agent. These components are linked together via protease-cleavable linker containing interchain disulphide bonds. The purpose of the linker is to attach the drug MMAE to the antibody enfortumab, and is designed such that it breaks down to release the drug inside tumour cells.



Nectin-4 is targeted as it has been found to be dramatically upregulated in bladder cancer, which conveys preferential binding of cancer cells over host cells. Nectins are transmembrane proteins and are located in adheren junctions. The binding between Nectin-4 and Nectin-1 has a role in cellular migration, cell division and proliferation.

Post binding of Enfortuman vedotin to Nectin-4 on the cell surface, the antigen-antibody complex is internalised via endocytosis, and thereafter trafficked into lysosomes. Here, lysosomal enzymes cause

# INFORMATION CORNER

## Results of the Physician Assistant Course across specialties being conducted by Manipal College of Health Professions, a unit of Manipal Academy of Higher Education, Manipal

Sr No	Name	Specialty	Qualification	Exam/ Result
1	Shalini	Obs/ Gynae	BSC-Nursing	Mid Term/ Not given due to medical reasons
2	Shelbin	Urology	GNM	Mid Term/ Pass
3	Nikhil Davis	Orthopedics	GNM	Mid Term/ Pass
4	Nitish	ENT	BSC-Nursing	Final/Pass
5	Jitesh	Neurology	BSC-Nursing	Final/Pass

## List of Webinars being conducted across specialties under the Department of Academics & Research in the last 3 months

Topic Name	Topic Name
Covid 19 & the Respiratory System: Serology, Microbiology & Radiology	Red Flag Signs of Heart Attack, Stroke in Adult Population
Do's & Don'ts of Telemedicine	Do's & Don'ts Of Celiac Disease
Essential Check to minimize Covid Risk to HCW	Bariatric & Metabolic Surgery Indian Scenario
How to protect yourself Post Lock-down	Arthritis Day
Roles of Robotics in GI Surgery	Food Allergies & Meal Plans for Celiac Disease
Covid 19 for Pediatricians: practical aspects, following the Government Guidelines	Surgery in Covid Times: What to do & What Not to?
Role of Emergency Medicine in Covid-19	Dealing with Psychological Stress in Pandemic
60 Yrs & Going Strong	How & Why to give up Smoking?
Tuberculosis in patient with Liver Disease	Laparoscopic Surgery In Covid Pandemic
Evaluation of Coronary Artery Disease: Current Status & Future Prospects	Rheumatoid Arthritis: Recent Advances & Management
Radiation Therapy in Cancer Care	Low Back Pain
Safe Schooling Post Lock-down	Covid -19 and Kawasaki Disease
Best Practices in Hernia Surgery	Obstetric Anesthesia- Need of the hour
Painless Labor	Plastic Surgery Revisited
Guidelines for Performing Minimal Access Surgery in Gynae during current Covid Scenario	Breast Cancer: Know all about Recent Development, Diagnosis & Treatment
What's new in Vaccination?	Eye Care during Lock-down
Diseases of Monsoon: Its Prevention & Management	Abdominal Pain in Children: Medical & Surgical Management
Dental Care	PET CT in Infection/Inflammation
Urinary Complications- How to avoid in Laparoscopic Surgeries	Leg Attack: Decoding Peripheral Vascular Occlusive Disease
How to write a Research Paper	Management of Osteoarthritis Knee Joint
PCOD: Dilemma of the Generation	Know Hepatitis to No Hepatitis
Scoliosis Awareness Day	Prevention of Covid in HCW

### Upcoming Important Days & Events

- 10 September: World Suicide Prevention Day
- 17 September: World Patient Safety Day
- 29 September: World Heart Day



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