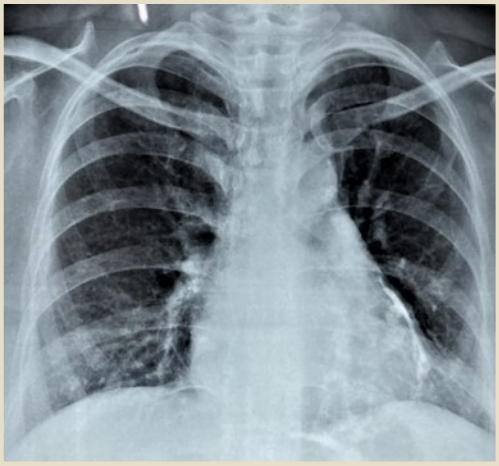
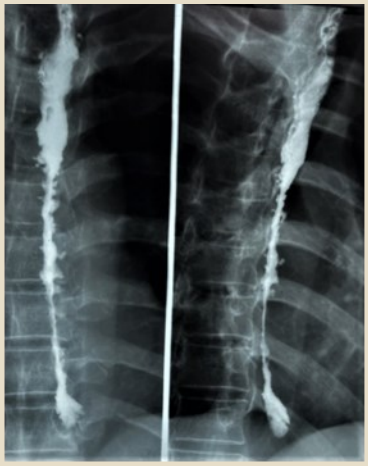
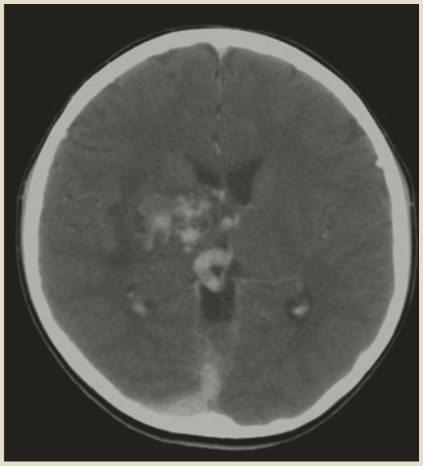
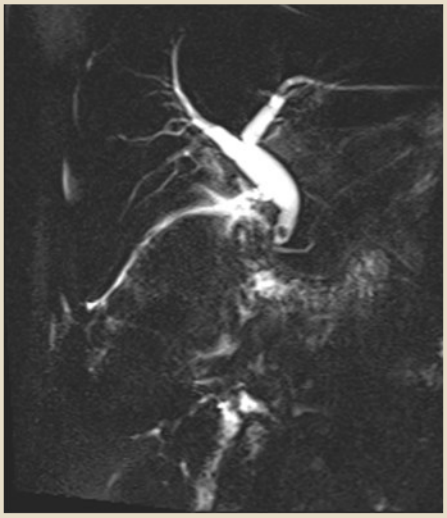
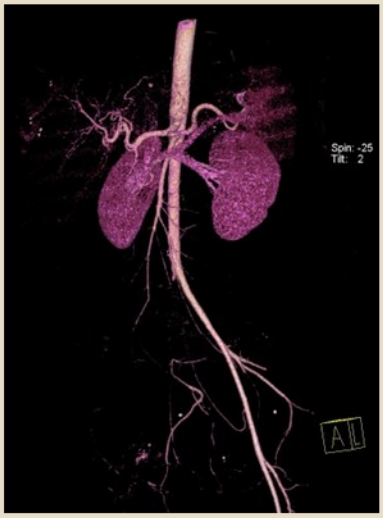
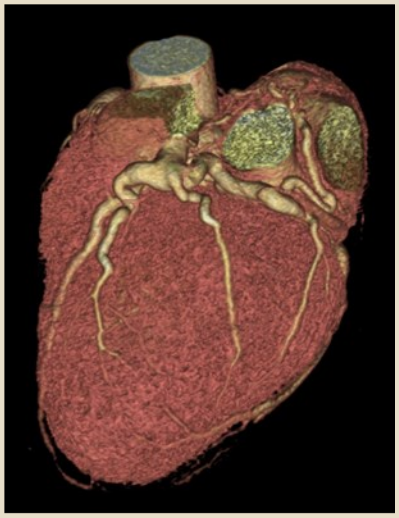
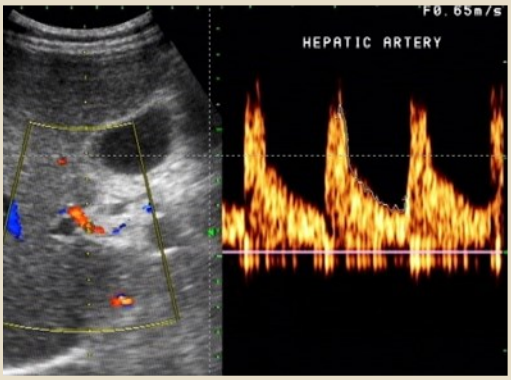
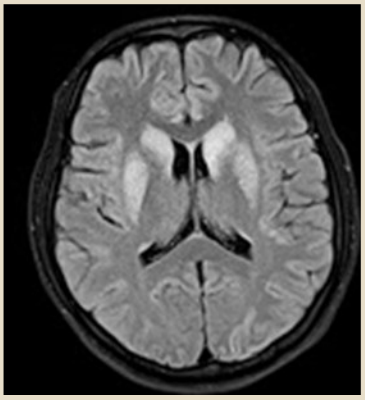
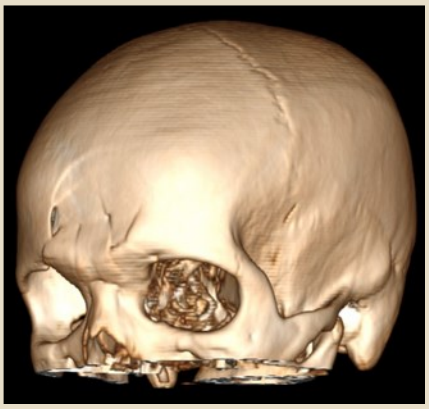
Waves

WAVES: THE OFFICIAL PERIODICAL OF CALCUTTA ACADEMY OF RADIOLOGY
VOLUME V, ISSUE II, APRIL 2024

WAVES
THE OFFICIAL PERIODICAL OF CALCUTTA ACADEMY OF RADIOLOGY
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Joint Editors: Dr. Anup Sadhu, Dr. Bijon Kundu and Dr. Viral Parekh.

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Editorial: The Delicate Balance: Radiology, Defensive Medicine, and Patient Care

Dr. Viral Parekh

In the realm of medical imaging, radiologists hold a crucial position in interpreting diagnostic tests and providing essential insights that shape patient treatment. However, the mounting fear of potential lawsuits has caused some radiologists to alter their approach to report writing and professional judgments. This trend, known as "defensive medicine," involves medical decisions driven more by a desire to minimize legal risks than to enhance patient outcomes.

Defensive medicine can take various forms in radiology. Some radiologists may produce excessively detailed reports with an exhaustive list of potential diagnoses, including those with low probabilities. Others might recommend additional, possibly unnecessary, imaging tests to avoid overlooking a diagnosis, leading to increased healthcare expenses and patient distress.

The repercussions of defensive medicine go beyond the radiology realm. Patients may face delays in receiving definitive treatment due to extra tests, while the surge in healthcare costs contributes to the overall escalation of medical expenses. Additionally, the trust in the physician-patient relationship may diminish if patients feel that their care is influenced more by legal concerns than their well-being.

Resolving the issue of defensive medicine necessitates a comprehensive strategy. Legal reforms, like tort reform to curb baseless lawsuits, can help alleviate the pressures that drive defensive practices. Education and effective communication are also vital; radiologists must possess the skills to communicate clearly with patients and referring physicians, explaining the reasoning behind their recommendations.

Moreover, fostering a culture of open dialogue about medical errors and near-misses, free from immediate legal threats, can promote learning and improvement. This can be supported by institutional policies that prioritize patient safety and quality improvement over blame and punishment.

Ultimately, although the fear of litigation is valid, it is essential for the medical field to strike a harmonious equilibrium that emphasizes patient well-being and upholds the standards of radiology. Through tackling the underlying issues of defensive medicine and fostering an environment of openness and patient-focused treatment, the objective of superior healthcare can be more effectively realized. The discourse surrounding defensive medicine is intricate and continuous, yet it is a vital discussion for the advancement of healthcare methodologies that truly benefit patients.

We appreciate the help of Dr. Bhavin Jankharia, Dr. Jithin and Dr. Mansi in bringing out 23rd. Issue of this periodical and we invite every Radiologist to be a part of this academic publication.

Joint Editors: Dr. Viral Parekh, Dr. Bijon Kundu and Dr. Anup Sadhu

Section I
Cases by
Dr. Bhavin Jankharia

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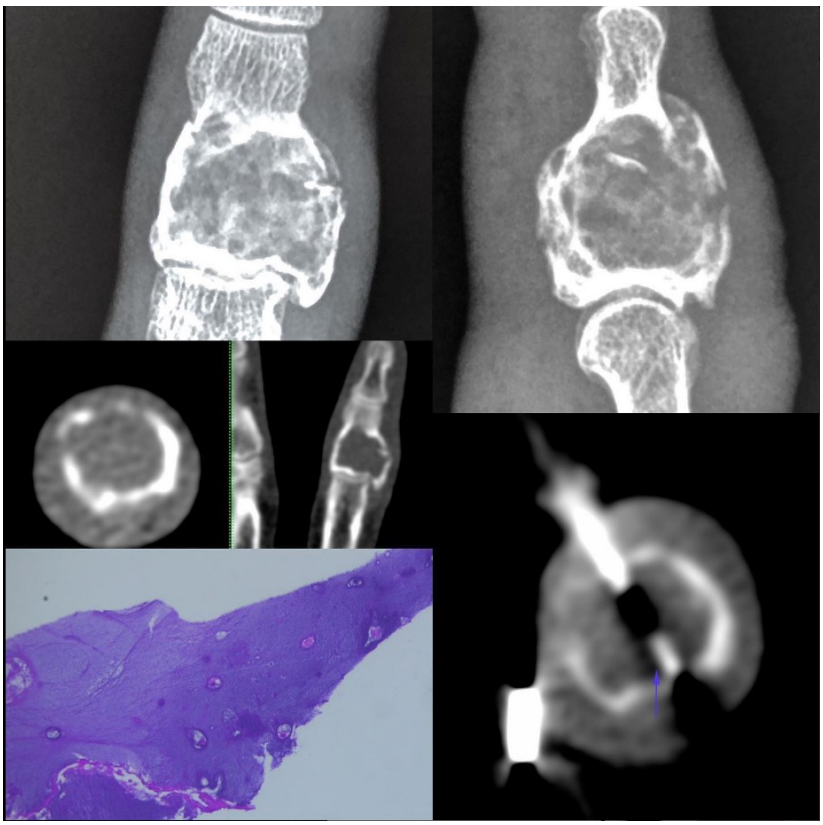
Dr. Bhavin Jankharia needs no introduction to the Radiology fraternity. As you all know he is a renowned Radiologist and academician and has contributed immensely in propagating Radiology education. Presently, he is a Consultant Radiologist at Picture This by Jankharia. He is also a Trustee of Radiology Education Foundation. He has consented to share some of his work with us, which will help all the Residents as well as practicing Radiologists. Here is some information about him in brief.

- He has written 5 books, 35 chapters, 57 articles (PubMed listed)
- Presented 32 posters
- More than 1500 invited lectures over 27 years
- Editor-in-Chief, Indian Journal of Radiology & Imaging (2007-2012)
- Latest Book (2019): Computed Tomography of Interstitial Lung Diseases
- Hon. Visiting Consultant – Radiology – Tata Medical Centre, Kolkata

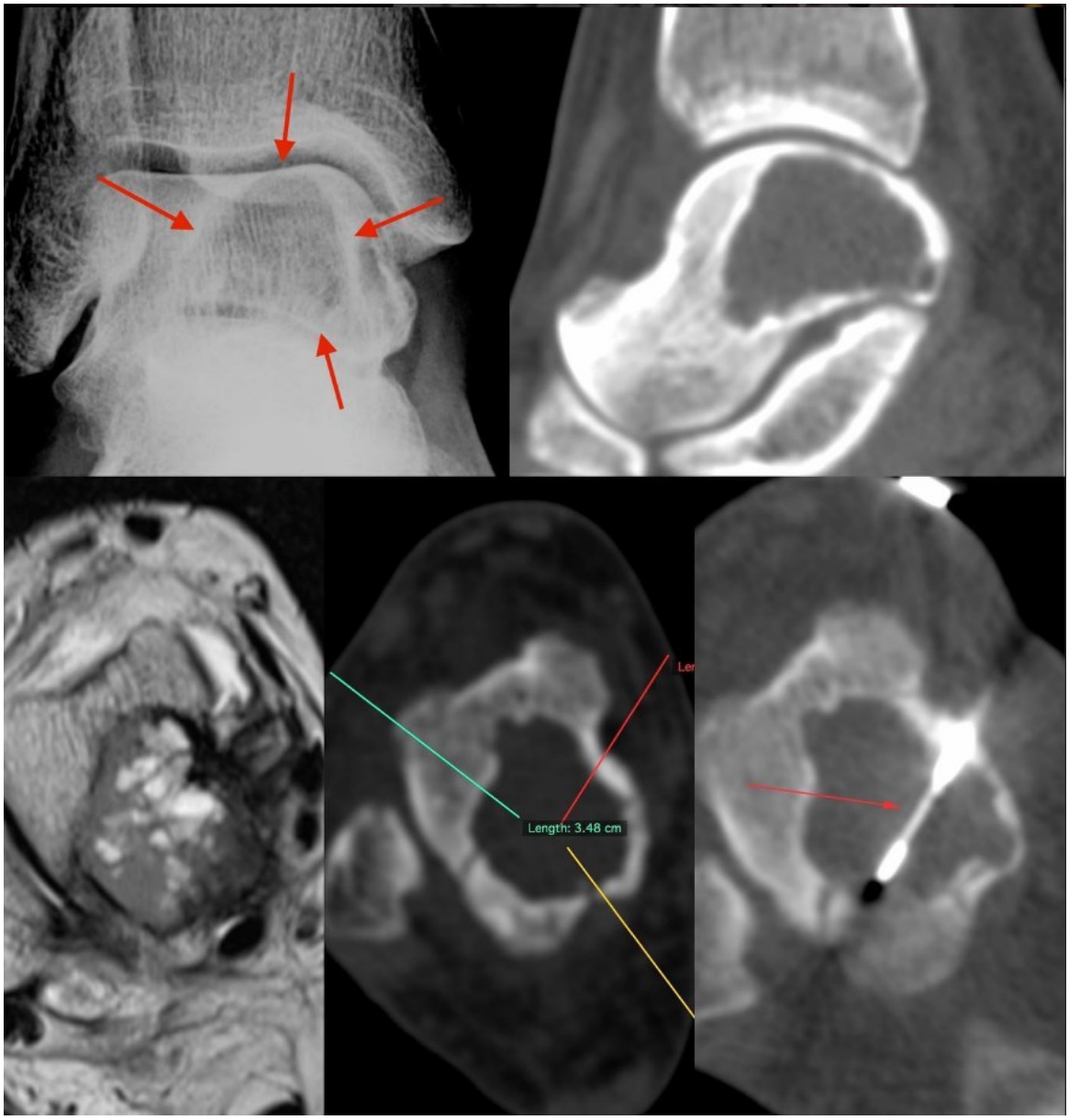
Case I : Enchondroma Phalanx



This is a 65-years old lady who had a swelling over the middle phalanx of her finger for many years. It started paining a month prior following an injury. The radiographs and CT scan show a clear fracture through a lesion that is characteristic of an enchondroma, even though a chondroid matrix is not seen on the CT scan. The patient and surgeon insisted on a biopsy to prove that this is a benign chondroid lesion.

Sometimes, it is best not to argue, so we went ahead and did the biopsy using an 18G coaxial biopsy gun and proved that it indeed was a benign enchondroma. And everyone was happy and relieved.

Case II - Talus Giant Cell Tumor (GCT) of the Ankle



This 29-years old lady presented with ankle pain.

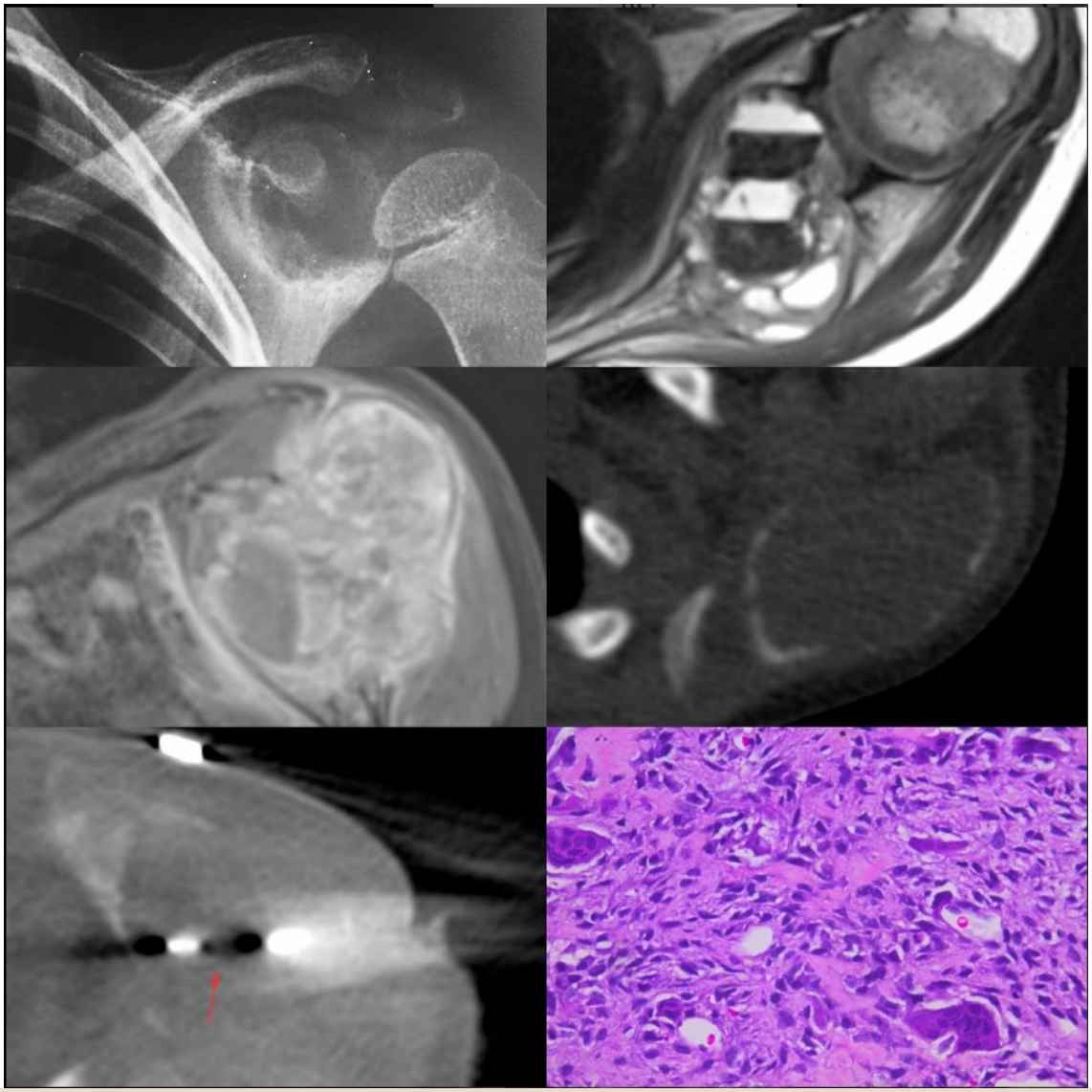
The frontal radiograph shows a well-defined osteolytic lesion with a narrow zone of transition. The sagittal CT scan shows the same finding. The MRI shows a typical T2 dark lesion with fluid levels, findings that, in the setting of a benign lesion, are suggestive of a giant cell tumor (GCT) with a secondary aneurysmal bone cyst (ABC) component.

The question was how to biopsy. For bone tumours, the biopsy should be done along the plane of the expected surgical incision. I drew these lines on the axial CT and sent them to the orthopaedic oncosurgeon, who asked me to biopsy along the red line, i.e. an anteromedial approach.

The final diagnosis was giant cell tumor (GCT).

Dr. Bhavin Jankharia, MD

Case III: Scapular Aneurysmal Bone Cyst (ABC)



This is a 3 years old boy who presented with an expansile osteolytic lesion in the glenoid of the left scapula. The MRI shows fluid-fluid levels, but these do not occupy the entire lesion. On the contrast study, the sagittal image shows heterogeneous enhancement.

This patient needs a biopsy irrespective of our pre-procedure diagnosis, given that the findings are atypical, which means that other conditions like telangiectatic osteosarcoma also need to be ruled out, though the patient is a little too young for this diagnosis.

The CT scan shows an expansile lesion. A biopsy was performed with an 18G coaxial needle in the prone position. The diagnosis was a giant cell containing tumor consistent with aneurysmal bone cyst (ABC)

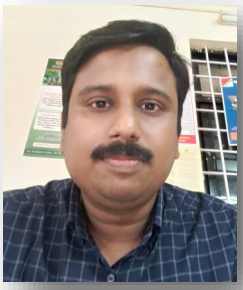
Dr. Bhavin Jankharia, MD

Section II

Dissertation

Sonological evaluation of ovarian tumours and its histopathological correlation.

Dr. Jithin A. S.
MBBS,DNB.



Dr. Jithin. A. S
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MBBS: Govt. Medical College, Thiruvananthapuram.
DNB: Vivekananda Institute of Medical Sciences, KOLKATA.
Certified in fetal imaging.
Certified in advanced cardiac imaging (University of Hong Kong)
Presently working as Senior Consultant Radiologist, NS Hospital, Kollam, Kerala.

Sonological evaluation of ovarian tumours and its histopathological correlation

INTRODUCTION:

An ovarian mass, also known as an ovarian adnexal mass, is a tissue mass in the adnexa of the uterus in the ovary. In premenopausal women, most ovarian masses are caused by ectopic pregnancy, ovarian cysts, tumours, polycystic ovaries, and abscesses. Ovarian mass lesions are common among women of all age groups and quite common among the reproductive age group. Ovarian masses are quite common presentation of a gynaecological pathology. These ovarian masses can vary from benign masses like functional cysts to malignant masses. The majority of ovarian masses are benign, but diagnosis is difficult because there are many forms it can take. Another common factor with these types of masses is that most are asymptomatic and are discovered during a routine pelvic or other examination rather than because they cause pain or discomfort.

Ovarian masses pose a special dilemma to the attending gynaecologist because the differential diagnosis is often difficult and complex. Also, the nature of the ovarian mass needs to be ascertained, whether benign or malignant, so that the patient gets the appropriate treatment for the condition.

Determining the benign nature of the mass through imaging will not only save the patient from unnecessary surgery but also alleviate patients worry. On the other hand, malignant masses need to be identified as early as possible so that the patient gets the appropriate treatment. This study has been conducted to find out diagnostic value of ultrasonography and its co-relation with Histopathological diagnosis. TVS (transvaginal ultrasonography) provide better portrayal of ovarian mass as compared to TAS (transabdominal ultrasonography). After using sonography, Histopathology is taken as Gold Standard for evaluation of Benign and Malignant masses.

AIMS & OBJECTIVES:

- **To evaluate the use of morphology of ovarian masses with ultrasonography and correlation with Histopathological findings .**
- **Comparison of ultrasound findings with histopathological diagnosis.**
- **To determine the spectrum of ovarian masses.**

MATERIALS AND METHODS:

STUDY SITE :

- **Department of Radio-diagnosis, Vivekananda Institute of Medical Sciences, Ramkrishna Mission Seva Prathisthan, Kolkata, West Bengal.**

STUDY POPULATION :

- **Patients referred to the Dept. of Radiodiagnosis of the said institution from the Deptt. of Gynaecology & Obstetrics for radiological evaluation of ovarian masses in all age groups and adnexal masses found incidentally in USG.**

STUDY DESIGN :

- **Observational study.**

SAMPLE SIZE :

- The sample size varied widely in the previous studies. It is calculated that 169 number of subjects will have to be studied in order to determine the prevalence rate with 5% margin of error and having 95% confidence limit. [Using the equation; Sample size n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)]

SUBJECT INCLUSION CRITERIA :

- All the suitable patients referred to the Deptt. of Radiodiagnosis of our institution from the Deptt. of Gynaecology & Obstetrics for radiological evaluation of ovarian masses in all age groups and ovarian masses found incidentally on USG.

SUBJECT EXCLUSION CRITERIA:

- Patients in whom histopathological correlation is not available.

STUDY TOOLS :

- Questionnaire form/Case record form.
- Informed consent in appropriate language.
- Ultrasound machine: Voluson E8 Expert ultrasound machine (Make: GE Medical Systems, Serial no: D00203, System ID: 083037600019111), first transabdominally through trans-vesical window, and then trans- vaginally. Transabdominal scans were done by 4C-D (2 – 5 MHz) sector probe and the transvaginal scans by RIC 5-9 D (4 – 9 MHz) endo-cavitary probe.

STUDY METHODOLOGY :

- The patients referred to the Radiodiagnosis department for radiological evaluation of ovarian masses after inclusion in the study was scanned. Ultrasound parameters like size, solid mass, type of cyst, papillary excrescence, measurable fluid in cul-de-sac, fixation to surrounding are evaluated and finally findings were correlated with histopathology.
-

SCANNING TECHNIQUE

Transabdominal sonogram:18,73

- The Transabdominal sonogram is performed with distended urinary bladder which provides an acoustic window to view the pelvic organs and serves as a reference standard for evaluating cystic structures. The distended bladder displaces the bowel out of the pelvic organs 5 to 10cms from anterior abdominal wall. The urinary bladder is considered ideally filled when it covers the entire fundus of the uterus. Overdistension may distort the anatomy by compressing and may also push the pelvic organs beyond the focal zone of the transducer limiting detail.
- The highest frequency transducer possible should be used in practice, most sonograms are performed using 5MHz or a 3.5MHz. Linear or curvilinear transducer arrays enable a wide scanning field. Sector probes are usually used for high resolution narrow scanning angle pictures.
- Imaging of the uterus and adnexa is performed, in both sagittal and transverse planes. The long axis of the uterus is identified in the sagittal plane, and a somewhat oblique angulation is often necessary to visualize the entire uterus and cervix. The adnexa may be imaged by scanning obliquely from the contralateral side, although in many instances visualization can be achieved by scanning directly over the adnexa, especially when an over distended bladder pushes the adnexa beyond focal zone of the transducer. Gentle pressure on the transducer may be necessary to bring the area of interest within the focal zone.

- When the transabdominal sonography is performed, other target areas can be scanned, free fluid in abdominal cavity and kidneys.

Transvaginal sonogram:18,71,73,74

- For Transvaginal sonography, the bladder must be empty to bring the pelvic organs into the focal zone of the transvaginal transducer. An empty bladder also provides patient comfort during the examination.
- It is important to explain the procedure to the patient and relieve any anxiety she may exhibit prior to initiating the examination. Verbal consent should be obtained. Careful consideration and respect should be given to the privacy. If the examiner is a male, it is essential to have a female staff member in the room during the entire examination to act as a chaperone.
- A pelvic exam should precede the imaging procedure to correlate the findings with image obtained. It is important if a certain discrepancy between the image obtained, and image expected in the case. The transducer is prepared with ultrasound coupling gel and then covered with a protective sheath, usually a condom. Air bubbles should be eliminated to avoid artifacts. An external lubricant is then applied to the outside of the protective covering.
- The transducer is inserted into the vagina with the patient supine, knees gently flexed, and hips elevated slightly on a pillow. The elevated hips allow free movement of a transducer by the operator.
- In patients with narrow introitus or vagina, who experience discomfort at attempted insertion of transducer, the examination should be discontinued.
- During insertion of the probe, the orientation of the transducer can be assessed by noting the position of the urinary bladder, which usually contains a small residual amount of urine. The normally consistent position of the angle of the bladder relative to the more variable positions of the uterus and ovaries makes it a good landmark to use when initially assessing transducer position and orientation. Rotating the probe 90 degrees into the coronal plane permits visualization of both the uterus and adnexa. Before recording any images, a complete pelvic survey should be performed. This survey is performed by slowly sweeping the beam in sagittal plane from the midline through both adnexa to the lateral pelvic walls. The probe is then rotated to the coronal plane, and the beam swept from the cervix to the fundus of the uterus. The survey will quickly ascertain the relative positions of the uterus and ovaries and identify any obvious masses.
- When the transvaginal probe is introduced, the urinary bladder, which is in close anatomic proximity to the cervix, should also be scrutinized in the median and coronal planes. If the urinary bladder is empty, the bladder should be scanned as the last structure when the rest of the examination is completed. By this time, there will be enough urine within the bladder.
- Next is scanning of the Pouch of Douglas or the cul-de-sac for presence of fluids or possible contents. To scan the cul-de-sac in meaningful way, one should tilt the fire of the probe toward the rectum and image the longitudinal section of the rectum on the same screen.
- Standard views are obtained:

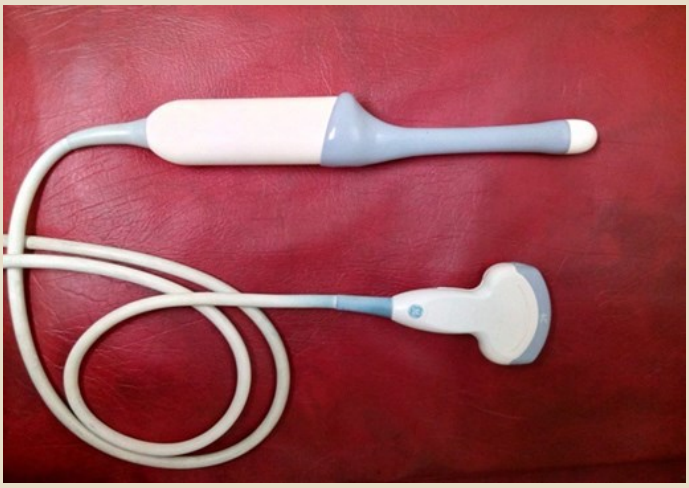
  Sagittal Plane:

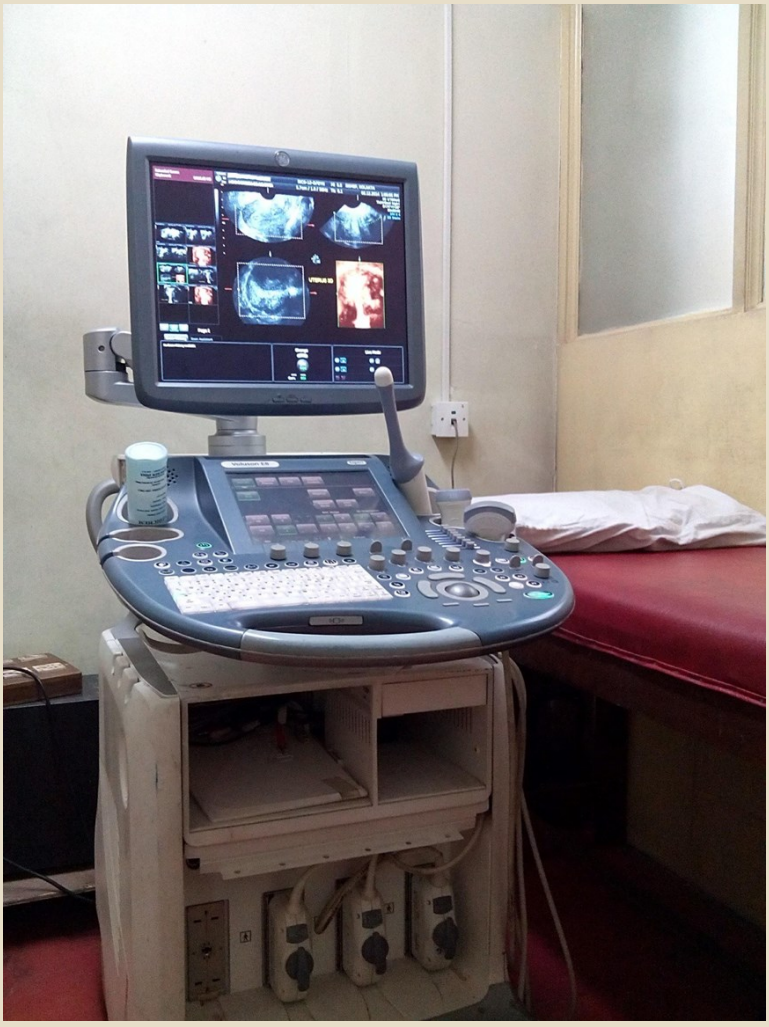
  1. Cervix, endocervical canal, posterior cul-de-sac.
  2. Uterus and endometrium.
  3. Right ovary and adnexa.
  4. Left ovary and adnexa.

Coronal Plane:

1. **Vagina.**
2. **Cervix and posterior cul-de-sac.**
3. **Uterine corpus and endometrium.**
4. **Uterine fundus and endometrium.**
5. **Right ovary and adnexa.**
6. **Left ovary and adnexa.**

Transabdominal and Endo-cavitary volume probes were used in this study.





The Voluson E8 Expert Ultrasonography Machine was used in this study.

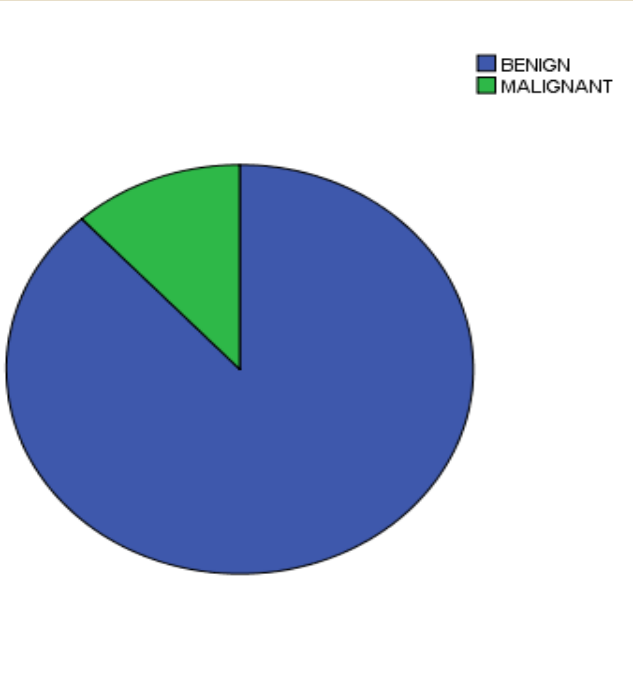
RESULTS & ANALYSIS :

- The statistical software version SPSS version 21.0 has been used for the analysis. Descriptive statistics by using frequency, percentage, sensitivity, specificity, and kappa test were used.
- All of the subjects were subjected to Transabdominal Ultrasonography with full bladder technique with 2-5MHz probe and then Transvaginal Sonography with empty bladder technique with 4-9MHz (except for the unmarried female patients). TAS and TVS was performed with the use of Voluson E8 by GE company. Observations included size, shape, and echogenicity of the pelvic masses in sagittal and transverse planes. IOTA scoring system was applied to differentiate benign and malignant ovarian tumours.
- For the IOTA scoring system, the masses were categorized into four subgroups based on their ultrasound appearance: (1) unilocular cyst, (2) multilocular cyst, (3) mass with a solid component but no papillary projections, and (4) mass with one or more papillary projections. A papillary projection is defined as a solid structure protruding from the cyst wall and measuring ≥3 mm in height.
- For each of the four subgroups a scoring system is used to classify the tumor as benign or malignant.78
- Total 169 patients were studied and histopathological diagnosis was as follows:

Histopathological diagnosis	NO (%)
BENIGN CYSTADENOFIBROMA	1(0.6)
BRUNNER TUMOUR	2(1.2)
CHRONIC NONSPECIFIC INFLAMMATION	1(0.6)
CLEAR CELL CARCINOMA	2(1.2)
CORPUS LUTEAL CYST	5(3.0)
ENDOMETRIOTIC CYST	15(8.9)
ENDOMETRIOID CARCINOMA	1(0.6)
GRANULOSA CELL TUMOUR	1(0.6)
HEMORRHAGIC CYST	23(13.6)
IMMATURE CYSTIC TERATOMA-GRADE 1	1(0.6)
INFECTED OVARIAN CYST	1(0.6)
LOBULATED CAPILLARY HAEMANGIOMA	1(0.6)
MATURE CYSTIC TERATOMA	27(16.0)
MUCINOUS CYSTADENOCARCINOMA	5(3.0)
MUCINOUS CYSTADENOMA	10(5.9)
NORMAL	3(1.8)
OVARIAN TORSION WITH HEMORRHAGIC CYST	3(1.8)
PARAOVARIAN CYST	3(1.8)
SEROUS CYSTADENOCARCINOMA	9(5.3)
SEROUS CYSTADENOMA	38(22.5)
SIMPLE CYST	15(8.9)
TUBO-OVARIAN MASS	1(0.6)
YOLK SAC TUMOUR	1(0.6)
TOTAL	169(100.0)

RESULTS & ANALYSIS:

- **Majority of the study population (31.4%) belonged to the age group of 21-30 years.**
- **In majority of cases (50.3%) right ovary was involved.**
- **In majority of cases (77.5%) the solid component was absent in Ultrasonographic and Doppler evaluation of the tumours.**
- **In majority of cases (55.7%) septation was present in Ultrasonographic and Doppler evaluation of the tumours.**
- **In majority of cases (64.5%) inner wall structure was irregular as found in Ultrasonographic and Doppler evaluation of the tumours.**
- **In majority of cases (80.1%) colour uptake was absent as found in Ultrasonographic and Doppler evaluation of the tumours.**
- **In majority of cases (88.8%) ascites was absent as found in Ultrasonographic and Doppler evaluation of the tumours.**
- **In all of the cases (100%) metastasis was absent as found in Ultrasonographic and Doppler evaluation of the tumours.**
- **In majority of the cases (40.8%) pattern of the tumour as found in Ultrasonographic and Doppler evaluation was unilocular cyst.**
- **The majority of the cases (53.8%) as found in Ultrasonographic and Doppler evaluation was benign ovarian tumour.**
- **In majority of the cases (82.2%) CA 125 level was normal.**
- **In majority of the cases (82.2%) CA 125 level was normal.**
- **Majority of the cases (22.5%) were serous cystadenoma as found in histopathological examination.**
- **Majority of the tumours (88.2%) were benign as found in histopathological examination.**
- **In majority (95.3%) of cases USG diagnosis was correct.**



Pie diagram showing distribution of study population according to positivity of malignancy in final diagnosis of the tumour as found in histopathological examination (n=169)

DISCUSSION:

- Ultrasonography (US) has established and developed itself as the most important preliminary imaging tool in identification and characterization of the ovarian masses. This has eliminated unnecessary surgeries in those who will not get any benefit out of it. Both Transabdominal and transvaginal techniques along with Doppler examination provides optimal visualization of ovarian masses. In the current study, mixture of both benign and malignant ovarian masses was present. Most of the benign lesions such as endometriomas, simple ovarian/ Para ovarian cysts, dermoid cysts, hemorrhagic cysts, and tubo-ovarian infections were specifically diagnosed. However, malignancies and certain benign solid masses were not further sub classified into teratomas, sarcomas, ovarian fibromas, serous and mucinous cyst adenomas. From a clinical perspective it has been found sufficient to suggest a benign solid ovarian tumor diagnosis rather than to be more specific .
- The exact nature of ovarian tumours cannot be confirmed preoperatively just by clinical examination. Ultrasonography continues to be the primary modality used to identify and characterise ovarian masses.
- In this study, total 169 patients of different age groups ,referred to the Department of Radiodiagnosis ,VIMS, Kolkata, West Bengal for radiological evaluation of ovarian masses and incidentally detected ovarian masses were imaged with TAS and TVS except for unmarried women where only TAS is used. The findings of sonography was correlated with histopathological findings which was taken as the gold standard.
- In the current study, in 169 patients belonging to different age groups,149 patients were diagnosed to have benign lesion(88.2%) and rest twenty patients were diagnosed to have malignant lesions. These data goes in with studies done by Kayastha S and Jha R et al.
- Kayastha S69 in a retrospective study recorded the nature of tumour whether benign or malignant observed the incidence of ovarian tumour was 16.7% among
- total gynaecological admissions, out of which malignant ovarian tumour was 9.5%. Jha R et al.70 evaluated the frequency of different histological types of ovarian tumours and their age distribution in 161 patients. His observation was one hundred and thirty-five of these tumours (83.9%) were benign and 16.1% (26/161) were malignant. Data of these two studies matches data showing the total prevalence of benign and malignant ovarian masses is similar in the southern region of West Bengal.
- In the current study of 169 patients, commonest benign tumour was serous cystadenoma (among 38 patients =22.5%) and commonest germ cell tumour was dermoid (16%).Among the malignant tumours, the commonest malignant tumour was serous cystadenocarcinoma. These data matches with studies done by Kayastha S and Jha R et al.
- Kayastha S69 in a retrospective study recorded that the commonest surface epithelial tumour was serous cyst adenoma (40.0%), and commonest germ cell tumour was Dermoid (25.3%) and commonest complication of ovarian cyst was torsion (12.6%). Jha R et al.70 evaluated the frequency of different histological types of ovarian tumours and their age distribution in 161 patients. His observations were one hundred and thirty-five of these tumours (83.9%) were benign and 16.1% (26/161) were malignant. Surface epithelial tumours were most common (52.2%) followed by germ cell tumours (42.2%). Mature cystic teratoma was the most common benign tumour (48.2%). Serous adenocarcinoma was the most common malignant tumour. The data of these two studies goes with the spectrum of ovarian tumours, are similar in the southern region of West Bengal.

- In regard of validity of USG as an imaging modality, according to the current study USG showed a sensitivity of 80% and specificity of 97.3% which is matching with Japanese Shizuoka Cohort Study, the study by Gagandeep et al. using a definite scoring system and the study by Hafeez et al.
- The Japanese Shizuoka Cohort Study of Ovarian Cancer Screening30 is a randomized controlled trial of 82487 low-risk postmenopausal women. The screening strategy achieved a sensitivity for malignancy of 77.1% and a specificity of 99.9%. Gagandeep Choudhary et al.61 evaluated the adnexal masses with conventional gray scale and colour doppler flow imaging in 30 patients with adnexal mass using scoring system and the final outcome of the study was sensitivity of 90.9% and specificity of 93.3%. Hafeez S et al.67 depicted sensitivity and specificity of ultrasound to be 90.7%, 95%CI (0.77, 0.97) and 91.4%, 95%CI (0.76, 0.98) respectively. Positive predictive value was 93%, 95%CI (0.79, 0.98) and negative predictive value was 89%, 95%CI (0.73, 0.96 and concluded that ultrasound should be used as an initial modality of choice in the workup of every woman suspected of having an ovarian mass.
- In regard to age group distribution, the present study showed 53 out of 169 patients belong to the age group 21-30yrs which is matching with the data obtained in study conducted by Jha R et al. Jha R et al.70 evaluated the frequency of different histological types of ovarian tumours and their age distribution in 161 patients. His observations were one hundred and thirty-five of these tumours (83.9%) were benign and 16.1% (26/161) were malignant. Surface epithelial tumours were most common (52.2%) followed by germ cell tumours (42.2%). Mature cystic teratoma was the most common benign tumour (48.2%). Serous adenocarcinoma was the most common malignant tumour (46.2%). For all age groups, benign tumours were more common than malignant ones. Most ovarian tumours (47.2%) were seen between 21-40 years.
- In regard to comparison of efficacy between USG and CA-125 as a screening tool, the superiority of USG in detection of ovarian masses is proven. This goes with the study conducted by Van Calster B et al and IOTA study. Van Calster et al.65 evaluated gray-scale and Doppler ultrasound findings and preoperative serum levels of CA-125 to discriminate benign from malignant adnexal (i.e., ovarian, paraovarian, or tubal) masses in 1066 women with a persistent adnexal mass. Ultrasonography correctly classified 93% (95% confidence interval [CI] = 90.9% to 94.6%) of the tumours as benign or malignant. Serum CA-125 correctly classified at best 83% (95% CI = 80.3% to 85.6%) of the masses and finally concluded that ultrasonography is superior to serum CA-125 for discrimination between benign and malignant adnexal masses. IOTA study done in 1066 patients also concluded that Ultrasonography is superior to serum CA-125 for discrimination between benign and malignant adnexal masses.
- According to the present study in 169 patients ,the most common USG pattern of tumour was found to be unilocular cyst(69 patients=40.8%).This is in contrary to what expected according to the study by L.Ameye et al where unilocular cyst occupied only 29.05% and was the most common tumour pattern. It is possibly due to the smaller size of the study population.
- Finally, the calculated kappa of USG with the definite gold standard histopathology showed strong agreement. The kappa value was calculated between USG and histopathology was 0.76, which indicates excellent agreement between two beyond chance alone and emphasizing the role of USG as a less expensive and non-invasive imaging option.

- Despite the fact that endometriomas are known to exhibit certain classical sonographic features such as a 'ground glass' appearance and low-level internal echoes I came across few false-positives cases of hemorrhagic cyst. Three cases of hemorrhagic cysts were inaccurately labeled as endometriotic cysts (false positives). Although such overlaps and confusions have also existed in the past in the literature as well between endometriomas and cyst adenomas, dermoid and hemorrhagic cysts on sonography. However, the final results showed a sensitivity of 80%,specificity of 97.3%,positive predictive value of 80%,negative predictive value of 97.3%,percentage of false negatives of 20% and percentage of false positives of 2.68%.
- However, the problem with ultrasound examination is its operator as well as equipment dependency. Furthermore, we would have to perform multiple studies prospectively on a larger scale with larger patient population to assess the reliability of any forms of imaging. Knowledge of the exact nature of a pelvic mass after ultrasound examination is also a prerequisite for effective management, surgical or non- surgical. Since this fact has been established well by literature that exclusion of ovarian malignancy with precise ultrasound information goes a long way in the future management and also helps avoiding needless surgical interventions not giving any benefit to them.
- This study has a practical relevance. In spite of extensive research work and international data available with the diagnostic accuracy of USG in detection of both benign and malignant ovarian masses, to our surprise the literature from this part of the world was scarce. No comprehensive study has been conducted in recent past that emphasizes the significance of such a novel and yet effective investigation tool in detection of malignancy which is so fatal. I hope this study will fill this gap in literature from the southern part of West Bengal and this study will encourage concerned personnel to expedite specific actions required to teach and train appropriate techniques to those who are routinely carrying out such USG, as early detection will not only improve the disease prognosis but would also help avoiding excessive radiation examinations in those who would neither benefit nor require them.
- The limitation of this study is its smaller size of population. Definite recommendations about efficacy of imaging modalities needs a larger scale study in a larger population.

SUMMARY:

- Ovarian mass lesions are common among women of all age groups and is a growing concern in modern day Gynaecology. They can vary from benign masses to malignant masses and usually benign lesions far outnumber the malignant ones. The nature of ovarian mass needs to be ascertained, whether benign or malignant, so that the patients gets appropriate treatment for the conditions.
- The study was conducted in 169 subjects over a period from Jan 2014 to June 2015, who are referred to the department of Radiodiagnosis ,VIMS, KOLKATA for radiological evaluation of ovarian masses and incidentally detected ovarian masses on USG with the aim of evaluating the morphology of ovarian masses with USG and its histopathological correlation.
- All the patients underwent TAS and TVS except in unmarried women where only TAS is done. The findings of sonography was correlated with histopathological findings, which was taken as the Gold standard.
- When compared to the histopathological diagnosis, USG using IOTA scoring system showed an overall sensitivity of 80% and specificity of 97.3% in comparison to the histopathological findings and was found to be statistically significant to diagnose ovarian malignancy.

- **An intentional effort was made during the study to evaluate the sensitivity and specificity of CA-125 as a screening tool for ovarian malignancy and was found to be inferior to USG.**
- **The final observations were the maximum cases belongs to age group 21-30yrs (31.4%) majority of ovarian masses were benign lesions(88.2%) and among all serous cystadenoma is the most common lesion(22.5%).In majority of cases, the pattern of tumour found in ultrasonographic, and Doppler evaluation was unilocular cyst (40.8%).**
- **Thus, the present work strongly supports the already proposed role of USG for evaluation of ovarian tumours and also shows its clear benefits over the CA- 125 estimation.**

CONCLUSION

The final conclusion of this study are:

1. **Statistics of ovarian lesions in southern West Bengal region is comparable with other international studies.**
2. **USG is an incredibly good non-invasive relatively low cost, less time-consuming imaging modality having high sensitivity, specificity, and predictive values in categorizing the ovarian lesions as benign and malignant.**
3. **CA-125 is less sensitive and less specific than USG to categorise ovarian lesions as benign or malignant.**
4. **Good agreement of USG with histopathology supports the prospect for using USG for categorizing ovarian lesions, which is a non-invasive test.**

RECOMMENDATIONS

1. **In perspective of the above conclusions, the recommendations of this study are:**
2. **All suspected ovarian lesions should be evaluated using a proper methodology and standard guidelines.**
3. **Use of a proper scoring system is advisable to avoid observer bias.**
4. **The routine use of invasive procedures for benign lesions should be gradually decreased and replaced by noninvasive ultrasonography.**
5. **A guideline should be made concerning who should be screened, frequency of screening and the optimal order of tests with a specific screening algorithm.**
6. **Optimal combination of TVS with other screening tests should be evaluated.**

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IMAGES

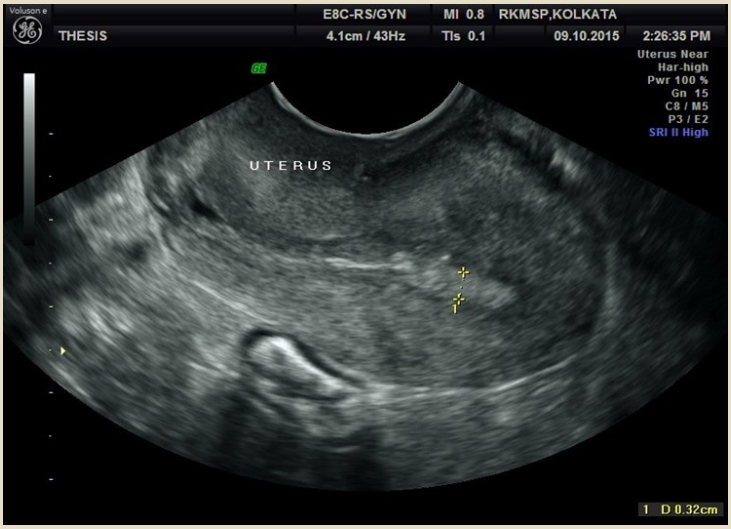
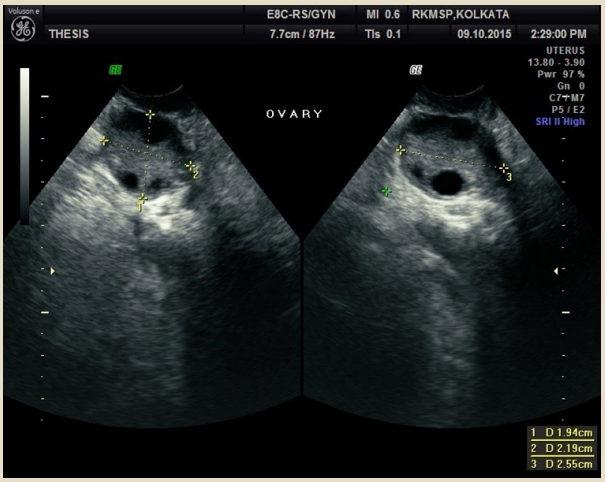


Fig.1:
Normal uterus and normal ovary (TVS)



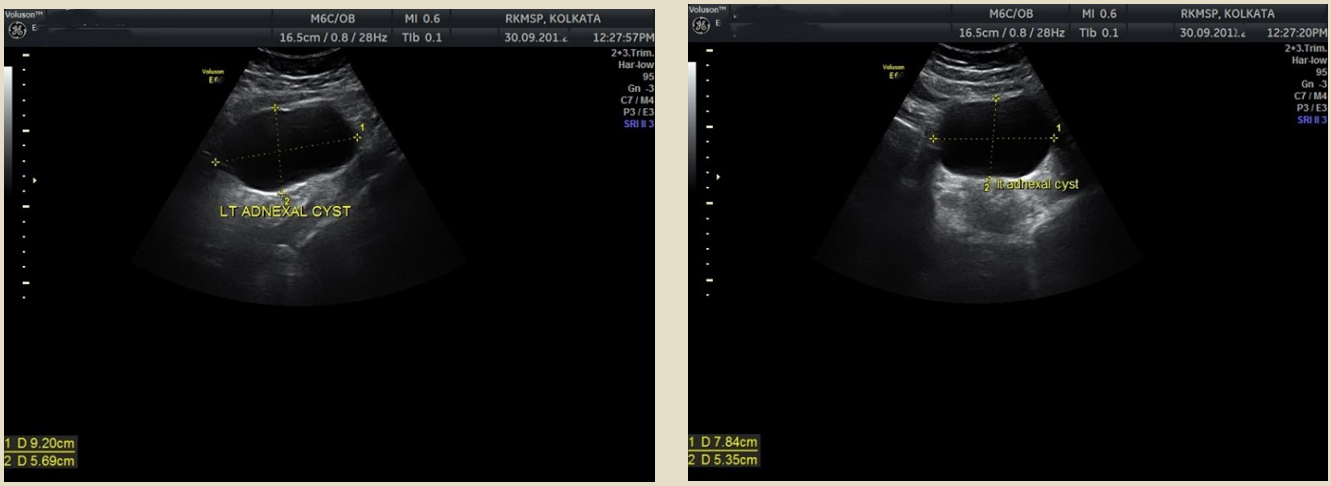


Fig.2: Unilocular cystic well marginated anechoic lesion- Serous Cystadenoma

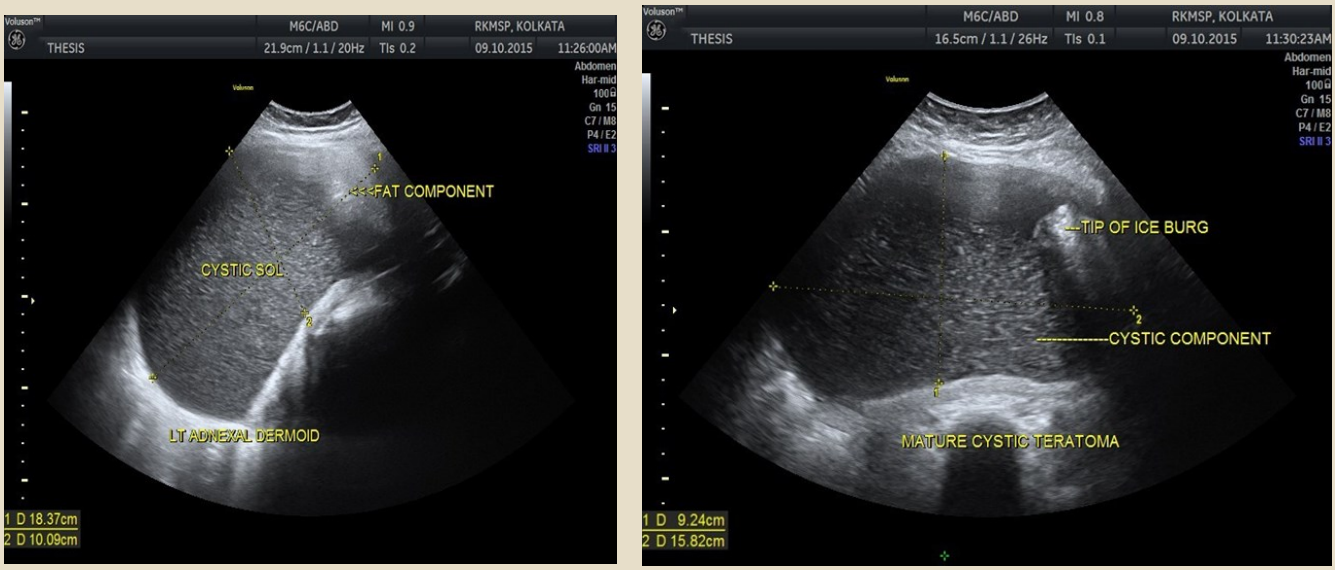


Fig.3: Complex cystic lesion showing positive tip of iceberg sign- mature cystic teratoma (histopathologically proven.)

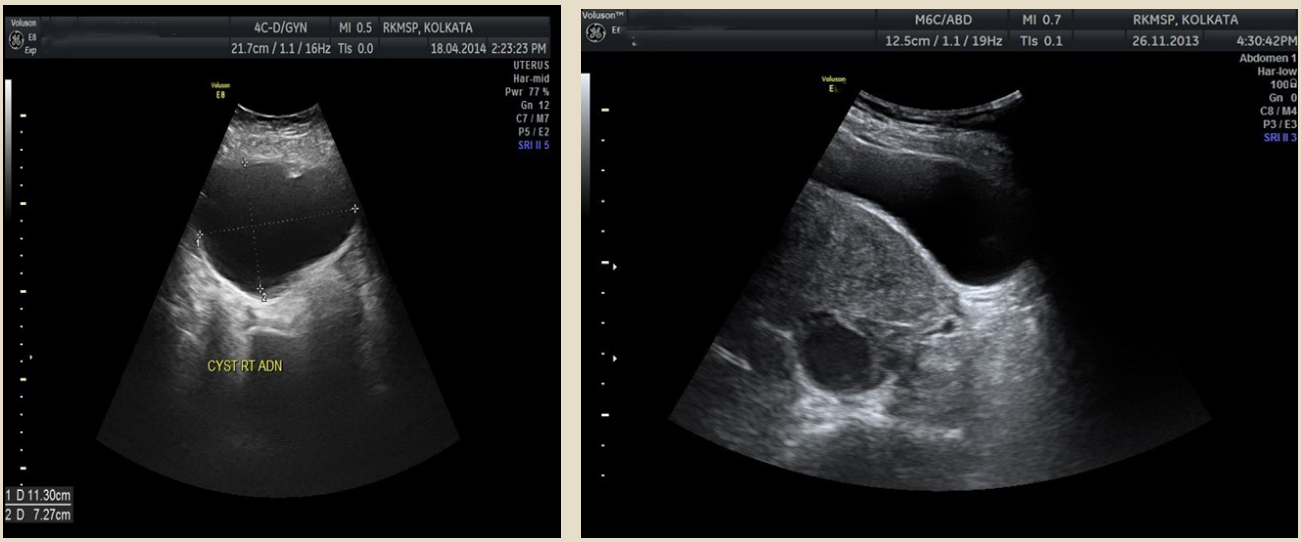


Fig.4: Thin-walled cystic lesion with thin thread like internal structures representing fibrin strands- haemorrhagic cyst.

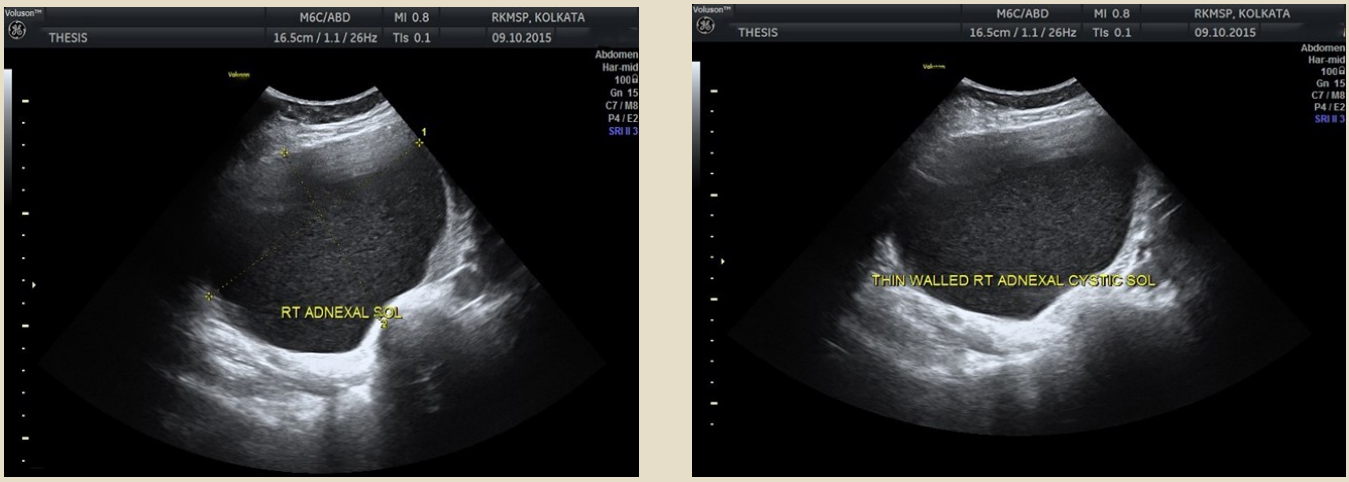


Fig.5: Unilocular cystic lesion containing low level internal echoes- Endometrioma.

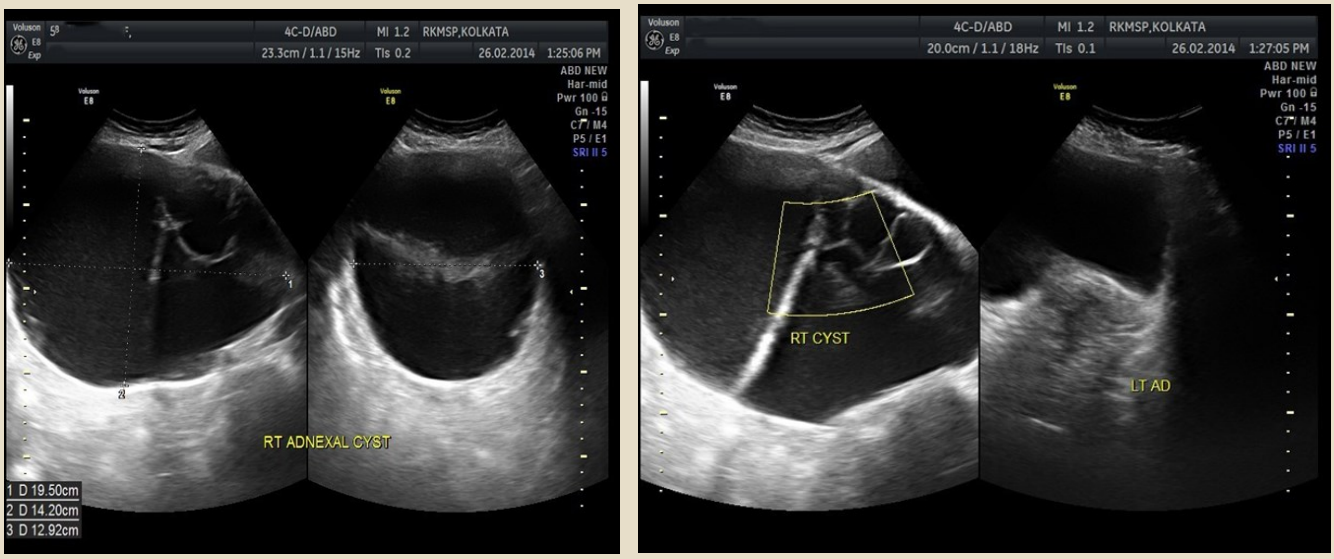


Fig.6: Multilocular thick walled cystic lesion with fine gravity dependent internal echoes- mucinous cystadenoma

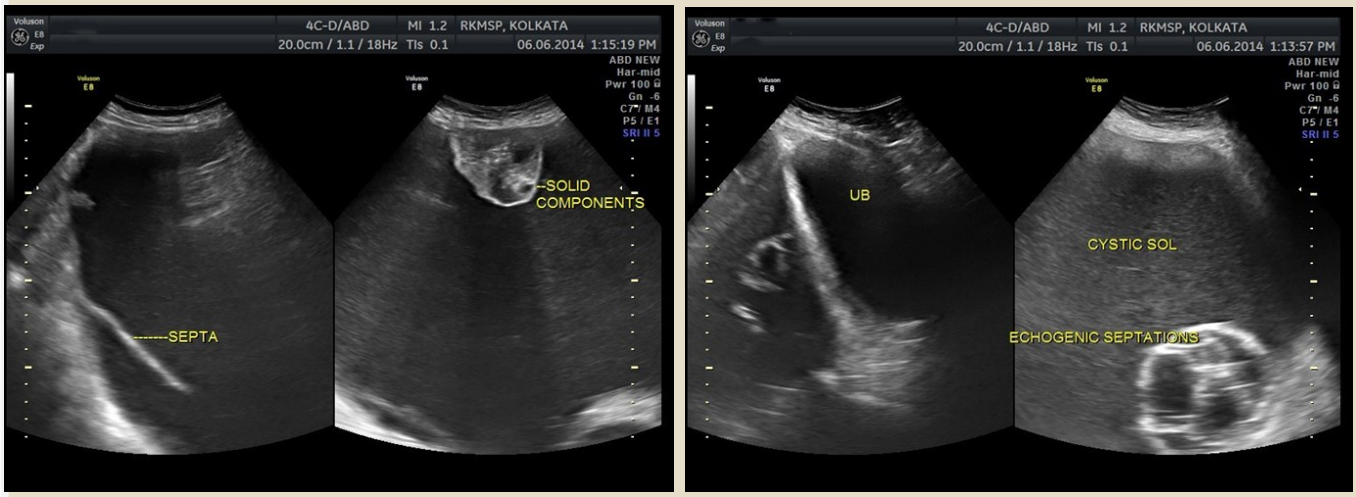


Fig.7: Large multiloculated cystic lesion containing echogenic material and papillary excrescences. thick septations are also noted as mucinous cystadenocarcinoma.

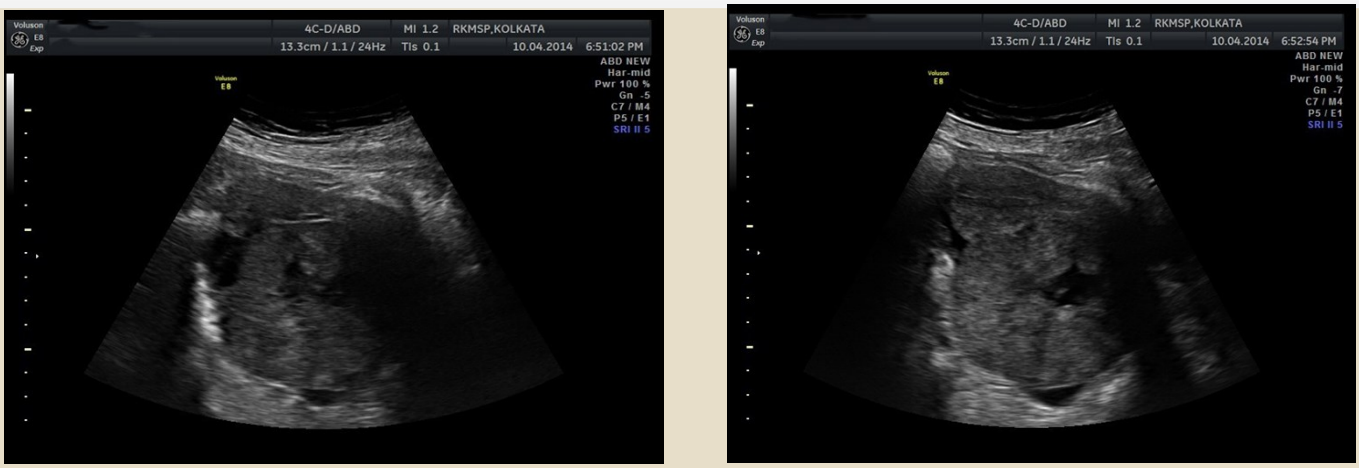


Fig.8: Solid multilobulated ovarian mass with minimal vascularity and minimal cystic component. Histopathologically proven as Yolk Sac Tumour.

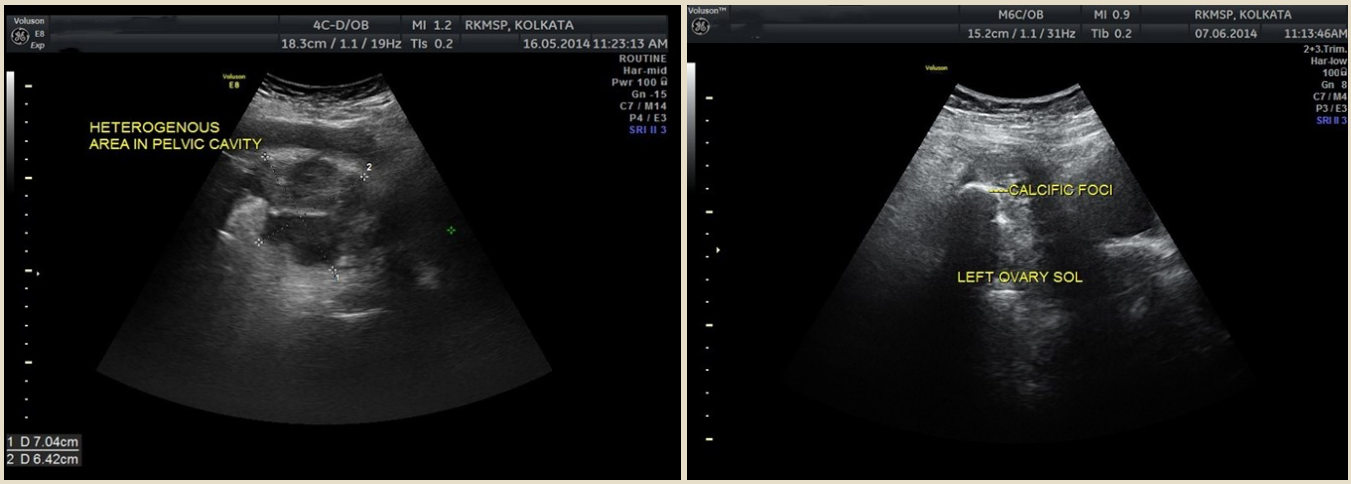


Fig.9: Predominantly cystic lesion with a solid component calcific foci. Histopathologically proven as Clear Cell Carcinoma.

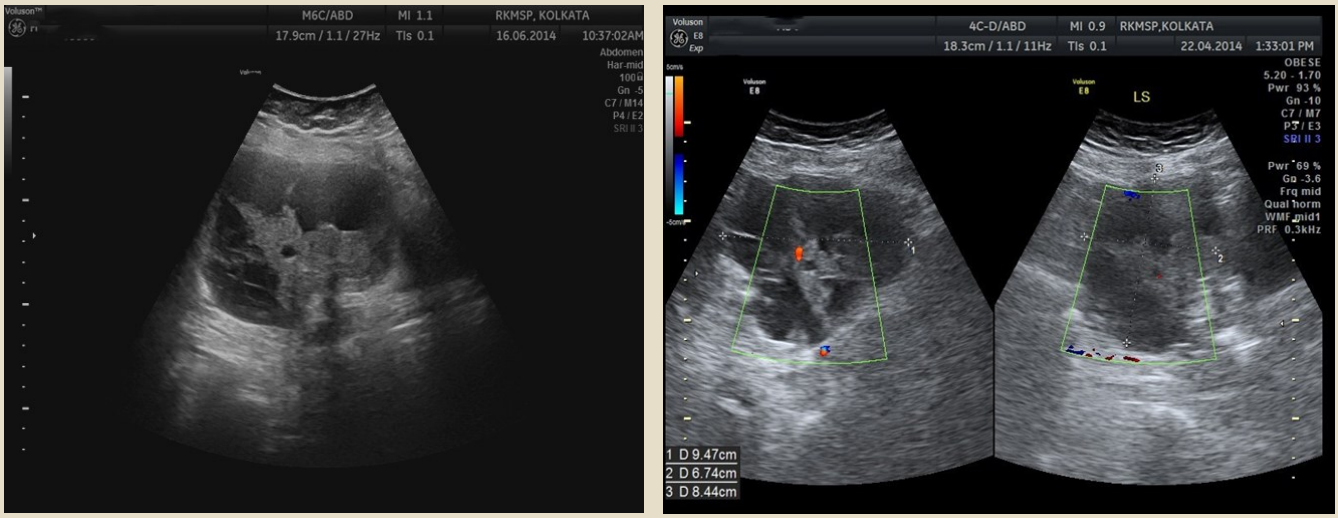


Fig.10: Complex cystic lesion with lobulated appearance and minimal internal vascularity. Histopathologically proven as Endometrioid Carcinoma.

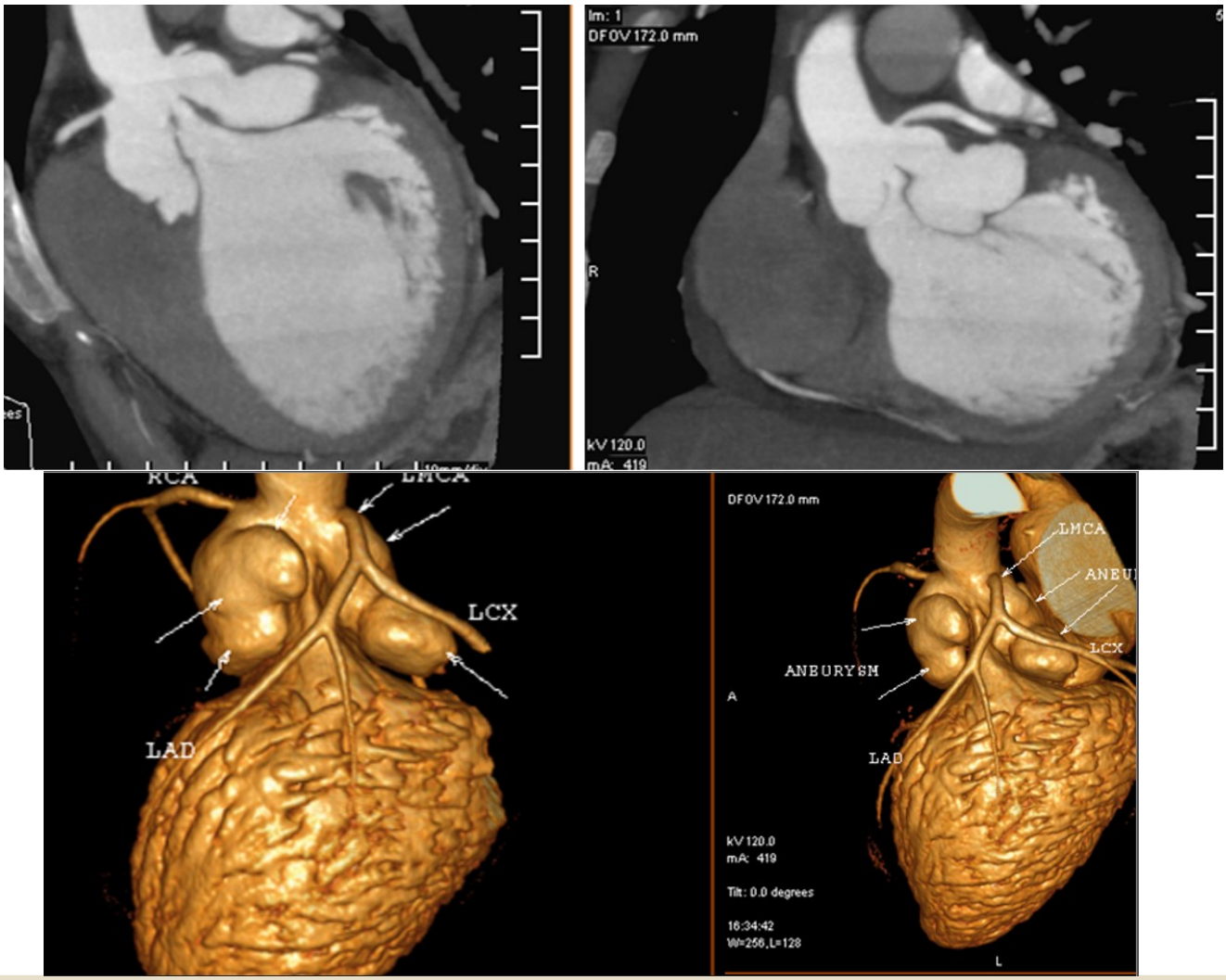
Section III

Captivating cases observed in the realm of radiology.

Dr. Viral Parekh

MBBS, DMRD, DNB.

Case I: Aneurysm of aortic root



- The aortic root is the initial segment of the aorta that contains parts of the aortic valve. It serves as the connection between the heart and the systemic circulation. Specifically, it lies between the aortic annulus (where the left ventricular outflow tract meets the aortic valve) and the sinotubular junction (where the ascending aorta originates).
- CT Imaging: Focal dilatation of the aortic root is observed, reaching up to 5 cm in diameter. Additionally, there may be atherosclerotic changes in the aortic wall. Notably, no diffuse ectasia or obvious aortic dissection is evident.
- Risk factors and causes of aortic root aneurysms include certain health problems such as genetic or connective tissue disorders like Marfan syndrome, Ehlers-Danlos syndrome, and Loeys-Dietz syndrome.
- Autoimmune or inflammatory diseases affecting the arteries, like Kawasaki disease, Takayasu arteritis, Behcet's disease, and Giant cell arteritis, also increase the risk of aortic root aneurysms.
- Other factors that raise the risk of aortic root aneurysms are infections around the heart, high blood pressure, atherosclerosis, and smoking.
- Aortic root aneurysms can also be caused by birth defects of the heart or blunt trauma to the chest.
- Complications of aortic root aneurysms can occur due to the stretching of the aorta affecting the valve that allows blood to pass from the heart to the aorta.
- Problems caused by aortic root aneurysms include aortic regurgitation, dissection of the aneurysm, and rupture of the aneurysm.

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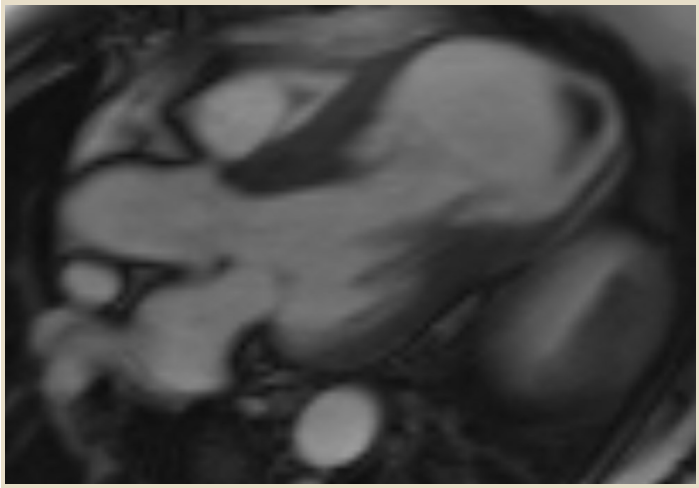
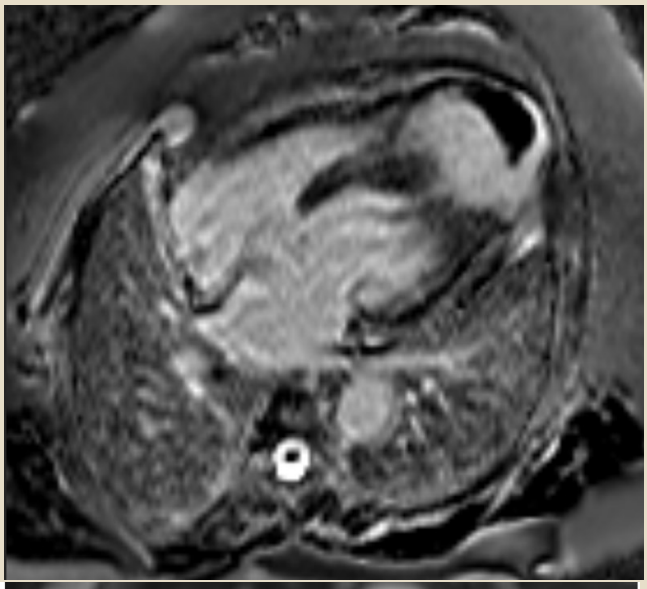
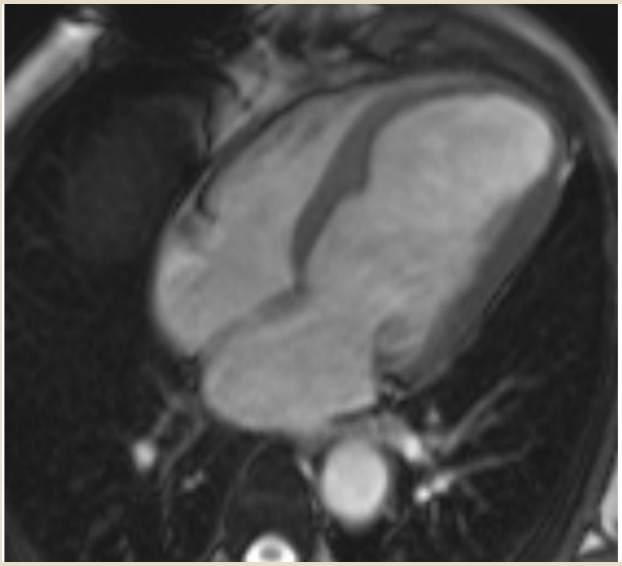
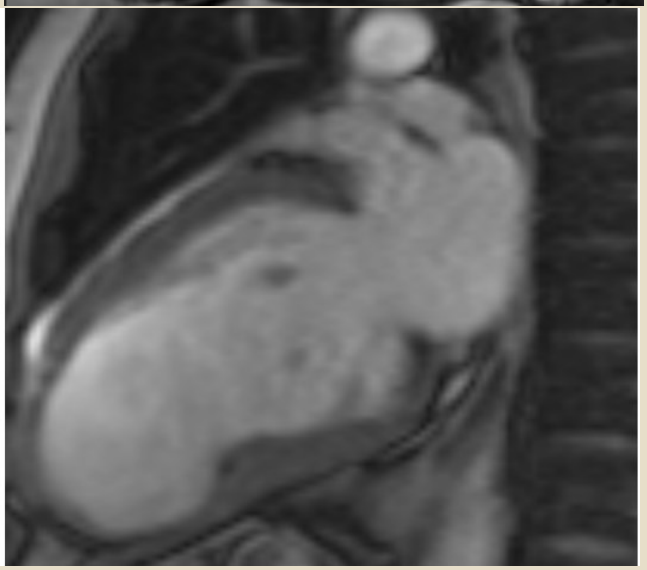
Case II: Left ventricular Aneurysms and Pseudoaneurysms

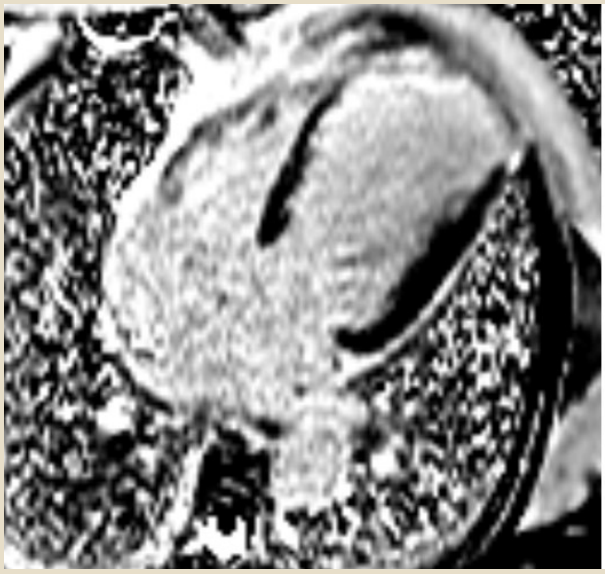


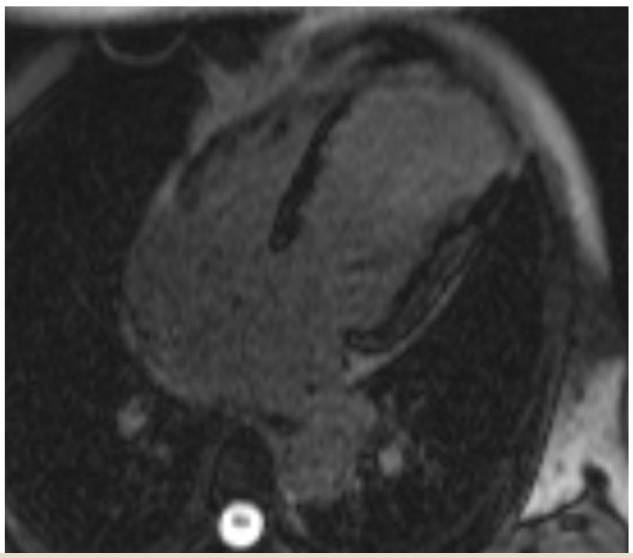


Left ventricular aneurysm with thrombus









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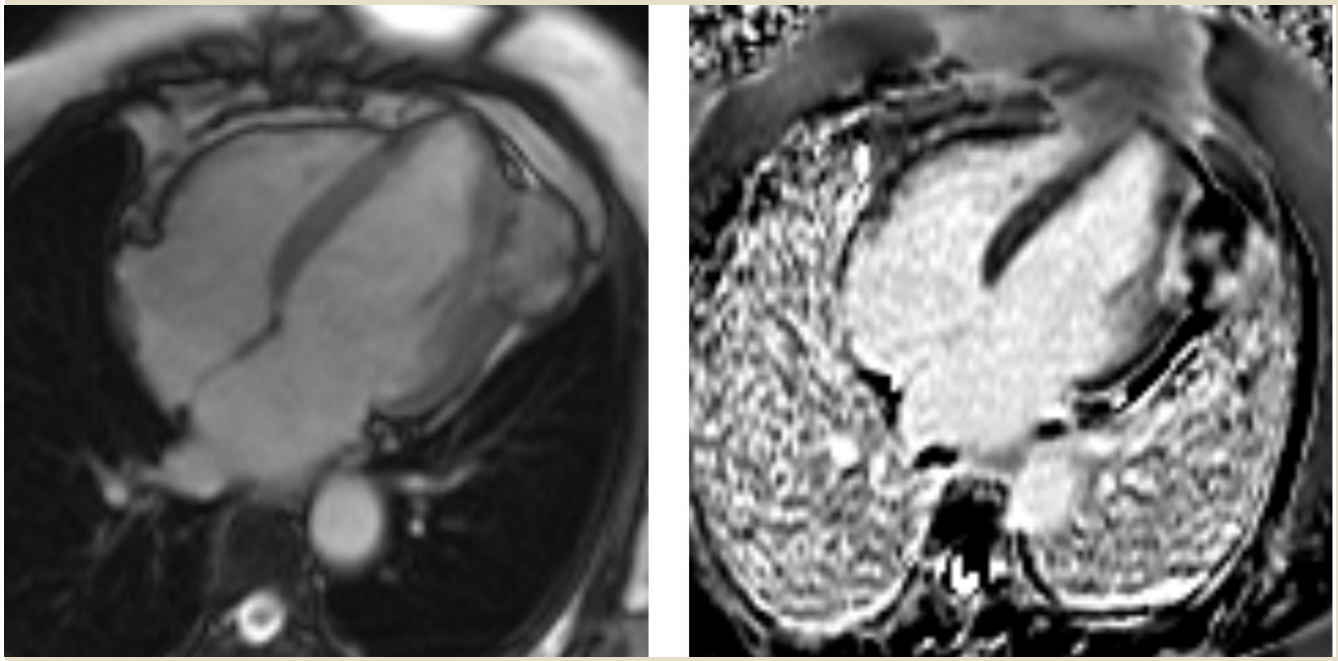
Discussion:

- **Aneurysms of the left ventricle can be a complication of myocardial infarction. In cases of acute myocardial infarction, the left ventricular wall may become so weakened that it could rupture.**
- **True aneurysms and pseudoaneurysms of the heart are both consequences of myocardial infarction. However, their causes, pathological features, diagnostic criteria, and treatments differ significantly.**
- **If the rupture is contained by the pericardium, it forms a pseudoaneurysm that can grow over time and eventually rupture. The current treatment for this condition is surgical resection.**
- **On the other hand, a true aneurysm of the left ventricle can develop due to myocardial remodelling and the formation of fibrous scar tissue. True aneurysms are made up of pericardium adhering to the underlying epicardium, with residual fibrous scar tissue from the infarcted myocardium beneath the epicardium. True aneurysms rarely rupture in their chronic phase.**
- **The distinction between the two types of aneurysms can be determined through contrast ventriculography, echocardiography, and MR imaging, which can evaluate their characteristic morphologies effectively. Delayed gadolinium-enhanced MR imaging is a novel technique used to evaluate viable myocardium.**
- **A true aneurysm, especially if small, may be asymptomatic and compatible with extended survival. Notably, a true aneurysm has a lower risk of rupture compared to a pseudoaneurysm. Rupture of a true aneurysm is rare, and surgical removal is typically required only in the presence of refractory angina pectoris, congestive heart failure, systemic embolization, or refractory arrhythmias.**
- **Given the critical clinical distinction between true aneurysms and pseudoaneurysms, additional evaluation using various imaging techniques is essential. A true aneurysm typically has a broad neck, with the neck diameter being similar to the maximum diameter of the aneurysm. While echocardiography is non-invasive, it may sometimes fail to accurately assess the neck of an aneurysm.**
- **One common imaging feature used to differentiate true aneurysms from pseudoaneurysms is the location, with a distinct bulge in the heart's anterior region suggesting a true aneurysm.**
- **The potential of MR imaging in the non-invasive evaluation of patients with myocardial infarction and subsequent complications is increasing. MR imaging is able to accurately locate the site of the aneurysm. It also has the advantage of being able to differentiate between pericardium, thrombus, and myocardium, which is not easily done with contrast-enhanced ventriculography or cardiac catheterization. Viability MR imaging of the myocardium uses a delayed contrast-enhanced imaging technique to precisely determine the size and extent of the infarct.**

- In the case of a true aneurysm, the tissue that makes up the wall of the aneurysm will show delayed enhancement, indicating scar tissue due to infarcted myocardial muscle.
- On the other hand, the wall of a pseudoaneurysm, which is composed only of pericardium, will not show delayed enhancement in the sac. However, the border of the aneurysm will show enhancement, indicating an infarcted area surrounding the aneurysm.
- Recent studies have shown that contrast-enhanced MR imaging can detect nonviable, infarcted myocardium by the accumulation of contrast material in both acute and chronic infarctions. In acute infarctions, the presence of hyperenhancement corresponds to regions of acute myocyte necrosis, while in chronic infarctions, the hyperenhancement correlates with scar tissue. By using contrast-enhanced delayed MR imaging performed after more than 5 minutes, viable myocardium can be easily distinguished from nonviable myocardium as unhyperenhanced and hyperenhanced regions, respectively.
- In patients with ischemic heart disease, a combination of cine and contrast-enhanced MR imaging provides diagnostic capability by allowing the examination of wall motion, visualization of a wide orifice, and differentiation between myocardial scarring and viable myocardium, which supports the diagnosis of a left ventricular true aneurysm.
- The delayed enhancement of the myocardium is not exclusively indicative of a myocardial scar (fibrosis). Other conditions such as tumours and inflammatory diseases have also been observed to exhibit delayed myocardial enhancement.
- To the best of our knowledge, enhancement of the pericardium associated with a pseudoaneurysm has not been previously documented. However, it is possible for a thrombus to form in an unruptured pseudoaneurysm, leading to subsequent organization or revascularization that could result in delayed enhancement.
- In conclusion, cardiac viability magnetic resonance imaging (MRI) plays a crucial role in imaging for aneurysmal characterization and in enhancing confidence in the diagnosis.



Left ventricular pseudoaneurysm.

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Section IV

E-learning: Links of YouTube teaching videos and About Us.

Hyperlinks of academic material published on YouTube by Calcutta Academy of Radiology

1	Imaging of acute Pancreatitis—Dr. Anirudh Kohli
2	USG of rotator cuff - Dr. P. K. Srivastava
3	PET CT Physics - Dr. Sikandar Sk.
4	PET CT in Neurology - Dr. Sikandar Sk.
5	CAR - Case of the week - Case 1 - Megalencephalic leukoencephalopathy with subcortical cysts. - Dr. Viral Parekh
6	CAR - Case of the week - Case 2 - Adenocarcinoma of terminal ileum - Dr. Viral Parekh
7	CAR - Case of the week - Case 3 - Stener lesion - Dr. Nivedita Chakraborty
8	CAR - Case of the week - Case 4 - Anterior shoulder dislocation - Dr. Nivedita Chakraborty
9	CAR - Case of the week - Case 5 - Secondary intracranial hypotension. - Dr. Viral Parekh
10	CAR - Case of the week - Case 6 - Intramyocardial Dissection - Dr. Ritu Agarwal
11	CAR - Case of the week - Case 7 - Radiation Necrosis and BT - RADS - Dr. Nivedita Chakraborty
12	CAR - Case of the week - Case 8 - Undisplaced right ulnar styloid base fracture - Dr. Nivedita Chakraborty
13	CAR - Case of the week - Case 9 - Hypoglycaemic encephalopathy. - Dr. Viral Parekh
14	CAR - Case of the week - Case 10 - Myocardial annular dysjunction - Dr. Ritu Agarwal
15	CAR - Tribute to Wilhelm Conrad Roentgen - Immortal Roentgen.
16	CAR - Case of the week - Case 11 - Dacryocystocele with anatomy of Nasolacrimal apparatus. - Dr. Viral Parekh
17	CAR - Case of the week - Case 12 - Tubercular osteomyelitis - Dr. Nivedita Chakraborty
18	CAR - Case of the week - Case 13 - Marchiafava Bignami disease - Dr. Viral Parekh
19	CAR - Case of the week - Case 14 - Parosteoal Sarcoma - Dr. Nivedita Chakraborty
20	CAR - Case of the week—Case 15 - Adrenal haemangioma - Dr. Viral Parekh

Hyperlinks of academic material published on YouTube by Calcutta Academy of Radiology

21	CAR - Case of the week - Case 16 Patellar GCT - Dr. Nivedita Chakrabarty
22	CAR - Case of the week - Case 17 - MEN Syndrome - Dr. Sayan Sarkar
23	CAR - Case of the week - Case 18 - Langerhans cell histiocytosis - Dr. Sayan Sarkar
24	CAR - Case of the week—Case 19 - Hepatic angiomyolipoma - Dr. Viral Parekh.
25	CAR– Case of the week - Case 20 - Cirsoid aneurysm - Dr. Viral Parekh
26	CAR CME - Heart Anatomy
27	CAR– Case of the week - Case 21 - Pancreatic metastases - Dr. Viral Parekh
28	CAR - Case of the week - Case 22 - Intrapulmonary teratoma - Dr. M. Bhattacharya
29	CAR– Case of the week - Case 23 - Gall stone ileus - Dr. Viral Parekh

We have just unveiled our website cal-academy-radiology.in dedicated to sharing our educational resources. Be sure to explore the site and stay informed. Additionally, you can connect with us on WhatsApp, Telegram, and YouTube. Don't hesitate to share your own cases for a chance to be showcased on our channel.

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A Platform For Radiology Education & Interaction

The Calcutta Academy of Radiology was founded on the 8th of November 2019, the International Day of Radiology, specifically, with the aim of promoting Radiology education for both Residents and practicing Radiologists.

Since then, we have been actively engaging on WhatsApp and Telegram, where members from around the globe have participated in discussions on thousands of cases, allowing us to share experiences and support one another. These social media platforms have proven to be invaluable learning tools.

In February 2020, we successfully organized a half-day CME focusing on GI Radiology. Subsequently, another CME on Neuroradiology was held in July 2022. We have intentions to host more CME programs in the future.

Furthermore, our presence on YouTube enables us to regularly share teaching videos, contributing to the dissemination of Radiology knowledge as widely as possible.

Next issue will be published in June 2024

We publish our periodical every two months, so the upcoming edition of "Waves" is scheduled for June 2024. We are seeking compelling cases and original content from our colleagues in Radiology, which will be chosen based on their quality. I extend an invitation to all of you to contribute to this Periodical. Please submit your material in Word format with high-resolution images, along with your photo and details of your workplace and email address. The deadline for submissions is May 15th, 2024. You can send the Word file to the email address provided or share it via WhatsApp using the three phone numbers listed.

On our YouTube channel, we regularly feature new cases and have received positive feedback on our educational videos. I kindly ask all Radiologists to share their educational videos with us. If they contain valuable content, we will certainly showcase them on our channel.

Our Telegram group currently lacks academic engagement compared to our WhatsApp group. Therefore, we encourage all of you to join our Telegram group. Telegram can host up to 200,000 members, so by posting our study material there, we can reach and benefit a larger audience.

Stay safe and take care, my friends. We eagerly anticipate seeing you all in the next issue of Waves.

Best regards,

Anup Sadhu, Bijon Kundu and Viral Parekh.

We appreciate all the contributors who have shared their experiences and literature with us, ultimately assisting the Radiological community.