VOLUME - III, JUNE 2018

Royal Care

CHAIRMAN'S COLUMN

Our team is growing in strength by the addition of more and more experienced doctors. The newly joined consultants have brought a large deal of expertise under their belt. The team of Intensivists that has joined us is a feather in our cap with which the Institute of critical care medicine shall be fully operational. We shall also start fellowship courses in critical care medicine.

We have completed our PET scan installation and have already completed over 200 cases in under 2 months. The new B block has been inaugurated and specialist OP departments have started functioning. It shall be completely operational by early 2019. With that, Royal care hospital shall be one of the leading facilities in western tamilnadu.

We have applied for the prestigious NABH certification and our team has proven that they can achieve anything by getting NABH safe-I certification within a very short span. I wish the team achieves full NABH and creates history by being the first hospital ever to get NABH within the first two years of initiation.

Regards

Dr. K. Madeswaran

Founder Chairman

When you come to the end of your rope, tie a knot and hang on" .

- Franklin D. Roosevelt

Royal Care

Ongoing construction of the new block is expected to be completed by November 2018 and it shall house the Bronchoscopy suites, Endoscopy suites, new and improved OP rooms, The Royal care Institute of Oncology with PET, SPECT, Radiation Oncology, Radio iodine, Bone marrow transplant unit etc and The Institute of Critical care medicine with state of the art beds for Medical, Surgical, Transplant (Cardiac, liver, renal), Neutropenic Intensive care units. This adds to the already existing ICU CCU, Neuro ICU, CTVS ICU, Neonatal ICU beds. IVF unit is also being constructed with one of its kind facilities.

The hospital has done a phenomenal job in acquiring the NABH Safe-I certification within 18 months of its inauguration, which has never been achieved by any other hospital in Western Tamilnadu yet. The hospital aims to reduce the rate of nosocomial infections even below international standards.

Various medical camps were conducted to screen patients and create awareness amongst public with regards to health. The hospital consultants gave lectures to the general public on various occasions and on media. In this edition, Maxillo facial surgery, Neurosurgery, Nuclear Medicine and Orthopaedics have highlighted the prowess possible by our consultants.

The Royal Care family warmly welcomes the new doctors and the team of experienced Intensivists who have joined us and enabled the further expansion of the Critical care units. We also congratulate our Endocrinologist Dr.Velayutham and GI surgeon Dr. Paulvannan for being awarded the prestigious life time achievement award by IMA. Consultant Radiologist Dr. Senthil Kumar has done us proud by achieving the best Radiology Administrator award.

SURGERY FOR OBESITY - IS IT COSMETIC OR METABOLIC?

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Introduction

Obesity has become a major public health problem worldwide, more so in Asian countries especially India. India is the third most obese nation in the world next only to USA and China. Tamilnadu ranks fourth in the prevalence of obesity. A simple measure of obesity is Body Mass Index (BMI).

$$BMI = \frac{\text{Weight (Kg)}}{\text{Height}^2\text{ (m)}}$$

Category	BMI(Kg/M2)
Underweight	<18.5
Normal	18.5-22.9
Overweight	23-24.9
Pre obese	25-29.9
Obese	30-40
Morbid Obese	40-50
Super Obese	50-60
Super Super Obese	>60

Morbidly obese have 10 times greater risk of death than general population. For every 10 kg of excess weight, the life expectancy is reduced by 3 years.

Metabolic syndrome

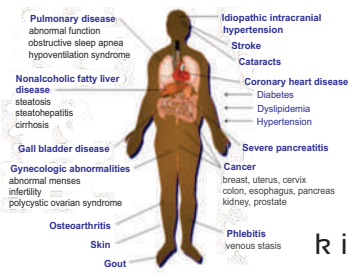
Obesity is a part of this syndrome in which obesity is associated with Diabetes mellitus, Hypertension, elevated triglyceride and reduced HDL levels. Treatment of obesity to be aimed in improvement of one or all of components of metabolic syndrome

Etiological factors

Obesity can be either primary or constitutional obesity in which no secondary causes are made out which amounts to 90%. Secondary causes of of obesity includes various genetic syndromes, neurologic, endocrine, psychological and drug induced.

Impact of obesity

Obese individuals are at risk of development of following chronic illnesses and obesity is directly linked to specific cancers like colorectal, pancreas, breast, esophagus, dney etc.



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Treatment options for obesity

1. Diet and life style modifications

2. Anti obesity drugs, 3. Surgery

Principles of low calorie diet

- Low fat, low carbohydrate, high protein and high fibre diet. Plenty of fruits and vegetables.

Limitations :

- Poor compliance, high rate of relapse
- Insignificant weight loss (5-10% of excess body weight)
- Inadequate for morbidly obese with multiple comorbidities

Anti obesity drugs

Orlistat was once a popular drug used for weight reduction, seldom used now due to side effects. Other anti obesity dugs include Lorcaserin, Phentermine/Topiramate, Naltrexone/Bupropion but none of drugs gained popularity.

Recently Liraglutide (GLP-1 analogue) was introduced in 2014 and FDA approved as anti obesity drug. Liraglutide is administered as Subcutaneous injection daily.

Limitations :

- Costly with poor compliance with ineffective weight loss.
- Temporary benefit, no long term data available.

Bariatric surgery

Bariatric surgery is the permanent treatment of choice and the only treatment that has been proven to be successful in the long term (more than 10 years).

Goals of surgery

- To create sustainable and significant weight loss (60-80% of excess weight loss)
- Cure or control of comorbidities
- Reduction of obesity related mortality

Indications

Guidelines	Without co morbidities	With co morbidities	Recommendation
National Institute of Health (NIH)	BMI ≥ 40	BMI ≥ 35	Should be considered
Asia pacific bariatric and metabolic surgery society	BMI ≥ 37	BMI ≥ 32 with Diabetes or two comorbidities	Should be considered
Asian diabetes surgery summit	BMI ≥ 37	BMI ≥ 32 with DM BMI ≥ 27 with many comorbidiies	Should be considered May be considered

Types of surgeries

Predominantly restrictive procedures

- Gastric banding
- Sleeve Gastrectomy(LSG)

Predominantly malabsorptive procedures

- Biliopancreatic diversion with Duodenal switch
- Jejunoileal bypass

Mixed procedures

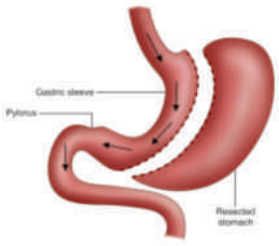
- Roux-en Y Gastric bypass(RYGB)
- Mini Gastric bypass(MGB)

Multidisciplinary approach for preoperative evaluation

Obese patients require thorough preoperative evaluation to select appropriate candidate for surgery which involves multiple specialities like :

- Bariatric surgeon, Anaesthetist, Intensivisit
- Cardiologist, Endocrinologist, Pulmonologist, Psychiatrist, Medical Gastro Enterologist
- Dietician, Social worker

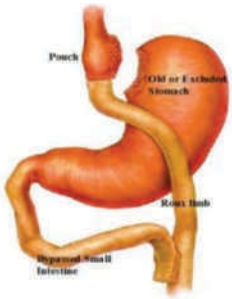
Sleeve gastrectomy



- Involves creation of long narrow stomach pouch of 150-200cc
- Relatively simple surgical technique
- No anastomosis, internal herniation, marginal ulcer, fewer nutritional deficiencies
- 50-70% excess weight loss

Limitations: Less effect on metabolic syndrome, lack of long term data, irreversibility.

RYGB



- Involves creation of small stomach pouch of 30 cc and craetion of Roux-en Y gastroje junostomy. Length of alimentary and bilio pancreatic limb are adjusted according to BMI. Usually kept at 100-150 cms
- Gold standard procedure with 60-80% excess weight loss and having good long term results
- An effective metabolic procedure

Selection of procedure

- There are no clear cut guidelines available as of now. Choice of procedure is determined by individual phenotype and aim of therapy. Commonly performed procedures are sleeve gastrectomy and RYGB. MGB has recently gained popularity since it combines the benefit of sleeve and RYGB but lacks long term data.
- Young obese, super obese, child bearing age, no co morbidities or well controlled co morbidities - Sleeve gastrectomy
- Obesity with uncontrolled DM, Metabolic syndrome, long duration diabetic, high insulin dosage, GERD - RYGB

Post surgery adherence to diet and life style modifications are very important to attain expected results. Bariatric surgery is not a cosmetic surgery. Goal of bariatric surgeon is to make patient healthy and not merely weight loss.

Here in Royal Care Super speciality Hospital, Neelambur, Coimbatore. We have a multi-disciplinary team for management of obesity & its related problems. We are equipped with state of the art instruments and Surgeons who are trained in weight loss surgery laparoscopically.

GASTRO @ ROYAL CARE

ABDOMINAL AORTIC ANEURYSM - A TICKING TIME BOMB

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57 year male smoker, alcoholic, nondiabetic, non hypertensive had IWMI 2010. PCI to RCA done in 2010. He is on regular medications. No chest pain or dyspnea and his TMT in 2017 was normal. During routine follow up in May 2018 he did not have any symptoms. Echocardiogram was advised which showed adequate LV function and mild PAH. Screening for abdominal aorta showed large infrarenal aortic aneurysm. USG abdomen showed 87*43*38 mm fusiform infrarenal aortic aneurysm. CT aortogram showed partially thrombosed infrarenal abdominal aortic aneursym extending from just below the right renal origin to aortic bifurcation for a length of 9.5 cm and maximum diameter of 5.8 cm.

Since the five-year overall cumulative rupture rate of incidentally diagnosed aneurysms in population-based samples is 25 to 40 percent for aneurysms larger than 5.0 cm and endovascular aneurysm repair carries low risk we suggested EVAR (Endovascular aneurysm repair). Aneurysm

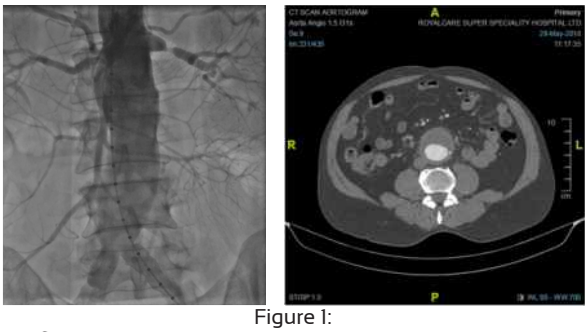

Figure 1:
Infrarenal aortic aneurysm CT- Aneurysm with thrombus

starts 1.2 cm below the lowest renal artery origin and there was layered thrombus at neck of aneurysm. Eventhough morphology of aneurysm is challenging we suggested for EVAR considering morbidity and mortality in an asymptomatic patient due to open repair.

June 2018, patient underwent EVAR under general anaesthesia. Through left femoral artery exposed by our cardiothoracic team, Medtronic Endurant II stent graft system with dimension of 36*16*166 was positioned accurately below the renal artery origin. Through right femoral artery approach the stent graft wired through the side limb port and Endurant II stent graft system 16*16*124 was deployed accurately from main limb into right Common illiac artery as the aneurysm involves the aortic bifurcation. Check aortogram showed no endoleak and postprocedure period was uneventful. Discharged in stable condition on day 3 of procedure and he started his routine activities after one week.

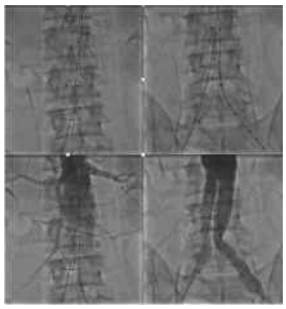

Figure 2: Covered stent after deployment

Discussion

An abdominal aortic aneurysm (AAA) is defined as a dilated aorta with a diameter at least 1.5 times the diameter measured at the level of the renal arteries. In most individuals, the diameter of the normal abdominal aorta is approximately 2.0 cm (range 1.4 to 3.0 cm). For practical purposes, an AAA is diagnosed when the aortic diameter exceeds 3.0 cm.

The majority of aneurysms never rupture, but when they do, sudden death from retro peritoneal or intra peritoneal exsanguination is usual unless surgery or endovascular repair is performed immediately. Acute AAA rupture is one of the most dramatic emergencies in medicine, particularly because it often masquerades as another problem. In the US, ruptured AAA is estimated to cause 4 to 5 percent of sudden deaths.

Most AAAs do not produce any symptoms. An occult AAA may be discovered as a result of screening, on routine physical examination, or on imaging studies obtained to evaluate an unrelated condition. Symptomatic AAA refers to any of a number of symptoms (eg, abdominal pain, limb ischemia) that can be attributed to the aneurysm.

Screening and prevalence

Screening studies show that abdominal aortic aneurysm (AAA) occurs in up to 7 percent of individuals over the age of 50. one-time screening for AAA is recommended for men ages 65 to 75 who have smoked, and in men ages 65 to 75 who have never smoked but who have a first-degree relative who required repair of an AAA or died from a ruptured AAA. Aneurysms over 4.0 cm in diameter are present in about 1 percent of men between the ages of 55 and 64; the prevalence increases by 2 to 4 percent per decade thereafter.

Risk of rupture in asymptomatic patients

Aneurysms less than 4.0 cm in transverse diameter are unlikely to rupture in the next five years.The five-year overall cumulative rupture rate of incidentally diagnosed aneurysms in population-based samples is 25 to 40 percent for aneurysms larger than 5.0 cm, compared with 1 to 7 percent for aneurysms 4.0 to 5.0 cm. The case-fatality rate is 50 percent when emergency surgery is performed on the 40 percent of patients with ruptured aneurysms who survive long enough to come to medical attention

EVAR

EVAR is favoured over open surgery as the perioperative (30-day) mortality rate was lower for EVAR compared with open AAA repair (1.2 versus 4.6 percent). EVAR (Endovascular aneurysm repair) involves the placement of modular graft components delivered via the iliac or femoral arteries to line the aorta and exclude the aneurysm sac from the circulation. It is indicated in patients with 1. Asymptomatic AAA≥5.5 cm, 2. Rapidly expanding AAA>0.5 cm in six months or >1 cm per year, 3. AAA associated with peripheral arterial aneurysm (eg, iliac, popliteal) or peripheral artery disease (eg, iliac occlusive disease).

Highlights

Aortic aneurysm was detected as we routinely screen for abdominal and thoracic aortic aneurysm during echocardiographic evaluation. Optimal management can prevent sudden death in these patients.

Even though the aneurysm had challenging morphology our expertise in dealing with complex morphology resulted in optimal outcome and early recovery of patient to his routine activities.

Learning points

- AAA can lead to sudden cardiac death.
- Screening for AAA is essential in patients above 65 years.
- During routine non abdominal surgeries at least clinical examination is mandatory as undetected AAA can rupture during stress.
- Asymtomatic patients with AAA size > 5.5 cm should be treated with EVAR if morphology is suitable.
- Unruptured AAA is a ticking time bomb.

MANAGEMENT OF EDENTULOUS MANDIBULAR CONDYLAR FRACTURE USING GUNNING SPLINT AS A SANDWICH A CASE REPORT

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Introduction

The Gunning splint initially was presented by Dr.Thomas Brain Gunning (1813-1889) for the immobilization of edentulous or partially edentulous jaw segments after reduction in the year 1864. For edentulous patients, treatment planning and surgical procedures poses greater difficulties during reduction and fixation of fractured atrophic mandible. Due to edentulism (absence of teeth), it is difficult to obtain the guidelines that are provided by occluding teeth for reduction and fixation of fracture. Since, the patients at older age are mostly medically compromised, open reduction of fracture site is not helpful as it might cause infection or poor healing or malunion. The denture bearing area of the edentulous mandible is not only fractured but also has less possibility of rapid and uneventful healing. For such cases, closed reduction with Gunning splint is preferred over open reduction technique. It holds together fractured segments of mandibular bone and immobilizes the jaws in occlusion.

A Gunning splint for the edentulous mandible consists of a type of mono block resembling two bite blocks joined together. These splints take form from modified dentures with bite block placed in posterior region and a space in incisor area to facilitate feeding. The immobilization is carried out by attaching the upper splint to maxilla by per-alveolar wiring and the lower splint to mandibular body by circumferential wires. Intermaxillary splinting can be done by connecting two splints with wire loops or elastic bands.

Although, the disadvantages include need for fabrication of impressions and the time lag associated with creating the splint, this method proves to be advantageous over the open reduction method or other conventional methods.

This article is a case report about managing edentulous mandibular condylar fracture by modifying existing complete denture into a gunning splint and sandwiching it between edentulous maxillary and mandibular alveolar ridges in contrast to the classical technique of per alveolar and circummandibular wiring of gunning splint immobilization.

Case Report:

A 74 year old male presented with alleged history of self-fall at his residence due to giddiness and sustained injury to his head and chin. He was initially treated in a local hospital with stapling of chin laceration. No history of LOC / vomiting / seizures. History of left sided ear and nasal bleeding was present. He is a known diabetic, hypertensive, old CVA, large ASD and ICH recovered and on regular treatment.

On clinical examination patient was conscious oriented with GCS 15/15. Stapled chin laceration, Left External auditory canal laceration with tenderness over Left Temporomandibular Joint (TMJ)and restricted jaw movements. He is completely edentulous and complete denture wearer for past ten years and was not wearing the denture at the time of the incident. On inspection the denture had attrited teeth and fractured flanges and reduced vertical dimension.

CT scan brain with facial bone showed small vessel ischemic changes in bilateral peri ventricular and frontoparietal white matter, global cortical atrophy, displaced fracture in neck of left mandibular condyle with anterior displacement and TM Joint dislocation and an undisplaced fracture in head of right mandibular condyle (FIG:1). Orthopantamogram showed displaced Left condylar neck fracture (FIG:2)

Considering his age and general physical condition, extensive procedure under general anaesthesia was not a treatment of choice and treatment planned was closed reduction of bilateral mandibular condylar fracture with maxillomandibular fixation (MMF) for two weeks using GUNNING SPLINT as a sandwich between edentulous maxillary and mandibular alveolar ridges under local anesthesia. Patient was explained about the procedure and complications such as possibility of weight loss upto 5kgs in 2 weeks and existing denture could not be used again were explained and consent for the same was obtained.

Cardiologist opinion was obtained for fitness to undergo procedure under local anaesthesia. Maxillary and mandibular arch impression was made and maxillo mandibular relation was recorded with corrected vertical dimension (VD) in the existing complete denture (FIG:3). Existing denture was modified into a proper Gunning splint in a dental lab with fused maxillary and mandibular dentures with an anterior feeding vent (FIG :4).

Under local anaesthesia (LA) with 2% lignocaine and Adrenalin (1:200000 dilution) infiltration and Left Inferior alveolar nerve block Left condylar fracture reduction was done and four IMF screws (intermaxillary fixation) were placed transmucosally in 14, 24, 33 and 43 alveolus region in the buccal vestibule after sandwiching the Gunning Splint in centric occlusion between the maxillary and mandibular alveolar ridges (FIG:5). Hemostasis was confirmed and patient was discharged with liquid and high protein diet through the feeding vent and oral antibiotic, analgesics and topical analgesic for traumatic mucosal ulcers were prescribed.

Patient was recalled after a week time, he tolerated MMF well and weighed 71 kilograms and after two weeks his weight was 70.9 kilograms compared to his pre-operative weight of 73 kilograms. After 2 weeks MMF was released and IMF screws were removed under 2% lignocaine with adrenalin 1:200000 dilution infiltration. Patient had pain free jaw movements and was advised active and isometric mouth opening exercise. Weight loss in 2 weeks was 2.1 kilogram. Patient was also advised for a conventional or implant supported complete denture after two weeks.

Discussion:

Gunning splints are indicated for reduction, fixation and immobilization of unilateral and bilateral fractures of edentulous fractures of maxilla and / or mandible[3,4]. These splints provide an indirect control on the bone fragments, transmitted through mucoperiosteum. However gunning splints are contraindicated in unfavorably displaced fractures lying outside the denture bearing areas, in grossly comminuted soft tissue and bone loss, and in severe posterior displacement of fractures of mandible. However, use of external fixation appliance in atrophic mandible fracture is limited due to reduced quantity of available bone.

In the current case scenario the classical way of immobilizing the gunning splint was not used considering patients co-morbid conditions and extensive procedure under general anaesthesia. Hence a more conservative and simpler method of immobilizing the gunning splint using per-alveolar IMF screws under local anaesthesia was preferred.

FIG: 3 Maxillo mandibular relation recorded in existing denture with corrected vertical dimension in centric relation

FIG: 4 Gunning Splint- existing denture modified with feeding vent

Miniplates osteosynthesis is less invasive treatment and suitable for atrophic edentulous mandible except for comminuted defects[2]. Gunning Splint as conservative treatment option is viables. It has been used satisfactorily for century but one problem with this is that it is difficult to establish vertical dimension of face[6]. Proper reduction of fractures of the edentulous mandible and / or maxilla requires the incorporation of correctly determined free way space into the Gunning Splint[1]. It is advisable to ensure an adequate vertical opening of the jaws, as this lessens the likelihood of respiratory obstruction.

Conclusion:

Gunning splints are valuable prosthesis in managing fractures with edentulous mandible and/ or maxilla. Acrylic gunning splints are rigid, strong, easily adjusted, lightweight and are tolerated by oral mucosa[7]. These splints are excellent way of managing closed reduction and fixation of fracture of maxillary and / or mandibular bones.

The novel technique of immobilizing the gunning splint as a sandwich between the edentulous alveolar ridges using IMF screws under local anaesthesia is cost effective and efficient way in managing edentulous mandibular fractures.

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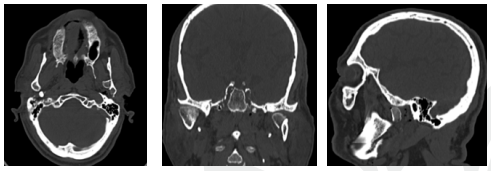

FIG:
1 CT scan – Axial, coronal and sagittal view showing displaced left condylar head fracture with displacement

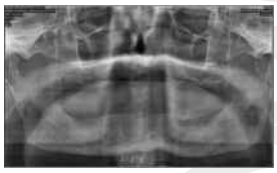

FIG: 2
Orthopantamogram (OPG) showing displaced Left Condylar head fracture of edentulous mandible.

FIG :
5 MMF using IMF screws and sandwiching gunning splint between alveolar ridges

DIAGNOSTIC CHALLENGE SIMPLIFIED WITH CARDIAC MRI – EMPHASIS ON ROLE OF T1 MAPPING IN CARDIOMYOPATHIES

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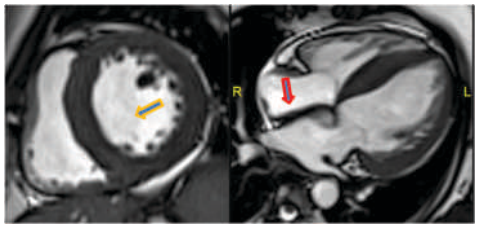
Introduction :

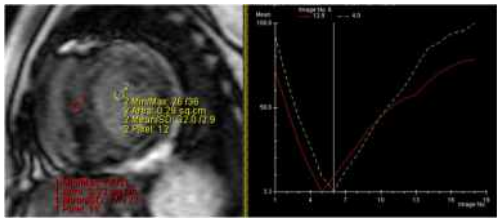
History of cardiovascular MRI dates back to 1981 when first recognizable images of the human heart were obtained. Image quality for cardiac MR remained below par compared with that in other organ systems, because of image degradation from respiratory motion which was overcome in 1991 with introduction of ECG gating. Cardiovascular MRI has evolved greatly over the past 25 years are so. In current era, cardiovascular magnetic resonance imaging has become the gold standard for evaluating myocardial function, volumes, and scarring. Additionally, CMR is unique in its comprehensive tissue characterization, including assessment of myocardial edema, myocardial siderosis, myocardial perfusion and diffuse myocardial fibrosis. We present a case where application of advanced CMR techniques simplified diagnosing infiltrative cardiomyopathy, alleviating need of invasive endomyocardial biopsy.

44 year old female with co morbidities of diabetes, hypothyroidism and minor coronary artery disease with worsening of left ventricular dysfunction since 2017 was referred for cardiac MRI to rule out infiltrative cardiomyopathy on clinical grounds and echocardiographic findings.

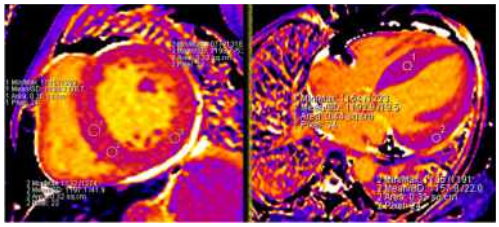
Cardiac MR Imaging Findings:



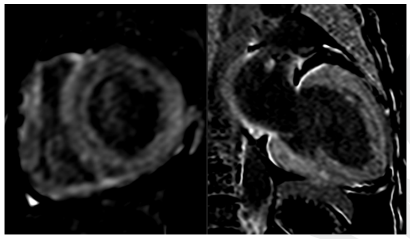
Images of cine SSFP sequence reveal concentric hypertrophy of left ventricular myocardium (Yellow arrow) and thickened interatrial septum (red arrow). No valvular stenosis/leak. Global hypokinesia of left ventricle with moderate systolic dysfunction (EF - 38%). No regional wall motion abnormalities.



Multi inversion recovery pulse sequence with time intensity curve revealed reversal of normal nulling pattern with early nulling of myocardium followed by blood pool (Red curve and ROI representing myocardium and yellow interrupted line and ROI representing blood pool).



T1 mapping – significant diffuse heterogenous augmentation of native T1 values of myocardium (represented by ROI) compared to established values in normal subjects for 1.5T MR system.



Delayed gadolinium enhanced imaging revealed abnormal blood pool appearance (generally will remain bright), suboptimal myocardial nulling with Zebra stripe pattern (central dark and bright band on either side) of enhancement in non-vascular territorial distribution.

The constellation of above findings in cardiac MRI is consistent with diagnosis of cardiac amyloidosis. Subsequent abdominal fat pad biopsy confirmed amyloid deposit.

Discussion:

Amyloidosis results from extracellular deposition of abnormal misfolded insoluble fibrils. The presence or absence of cardiac involvement in amyloidosis is the most important prognostic factor. Untreated amyloidosis is associated with higher complication rate like CCF, arrhythmias and eventually death in its natural course. Hence early diagnosis and treatment is of at most importance. Although endomyocardial biopsy remains the reference standard for diagnosis, it is not routinely performed because it is invasive and prone to sampling errors with false-negative results.

Cardiac MRI by its inherent ability to characterize myocardium exploits the expansion of extracellular space by deposition of abnormal proteins. After administration of gadolinium, which is retained in areas of increased interstitial space, intrinsic MR differences are accentuated, permitting selective visualization of fibrosis by means of late gadolinium enhancement. As a result abnormal myocardium is depicted as bright signal against normal dark appearing nulled myocardium. However late Gd enhanced works best when the border between normal and abnormal is distinct and the region of abnormality is sufficiently different. In amyloidosis, the discriminative capacity of LGE is limited because the entire myocardium is abnormal and clear demarcation is absent.

Diffuse myocardial processes are better assessed through T1 mapping techniques that estimate the myocardial T1 tissue relaxation time in a pixel-wise manner to create a T1 map. Two important determinants of an increase in native T1 are oedema and increase of interstitial space. The two important determinants of low native T1 values are lipid and iron overload. In our case there was significant diffuse augmentation of T1 values indicating expansion of interstitial space secondary to amyloid deposition.

Conclusion:

Diagnosis of cardiac amyloidosis still remains tip of ice berg with cases misdiagnosed as hypertensive cardiomyopathy or HCM because of LV hypertrophy. Team effort with strong clinical suspicion by cardiologist and referral for further imaging with cardiac MRI helped to crack the diagnosis in this case with timely inception of therapy.

Congratulation ! !

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to
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at Docotors Day Celebration
on 8th July 2018

Indian Medical Association
Coimbatore Branch
&
Association of Surgeons
of India Coimbatore Chapter
Presents this
"LIFE TIME ACHIEVEMENT AWARD"
to
Dr. S. PAULVANNAN
at Docotors Day Celebration
on 8th July 2018

Award of
NABH Safe - I
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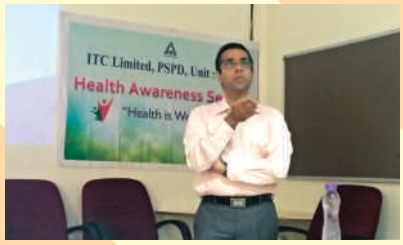


Health Awareness Talk
at ITC Ltd by
Dr. B Paranthaman Senthupathi

CME held at Christian
Fellowship Hospital,
Oddanchathiram by
Dr. A. Sandeep Chandrasekar,

Inauguration of
Vellalore Centre

ESI
Meeting

Medical Camp @ Karur

Hand Hygiene day - Address by Dr. Paulvannan

UYIRIN SWASAM
(2 crores trees by 2022)
planting by - Dr. K. Madeswaran, Chairman

Health Awareness Talk Program at Govt Girls High School, Kalapatti by Dr. S. Kalyanakumari

NEURONAVIGATION IN THE SURGICAL MANAGEMENT OF INTRACRANIAL LESIONS: CURRENT TRENDS

Dr. K. Madeswaran
M.Ch (Neuro Surg)
Chairman and
Consultant Neuro & Spine Surgeon

Dr. K. Ragurajaprakash
MRCS(UK), DNB (Surg), FMAS,
CNMT (USA), M.Ch (Neuro Surg)
Junior Consultant Neuro Surgeon

Dr. Senthilkumar. R
MBBS, MS (Gen Surg),
M.Ch (Neuro Surgery)
Junior Consultant Neuro Surgeon

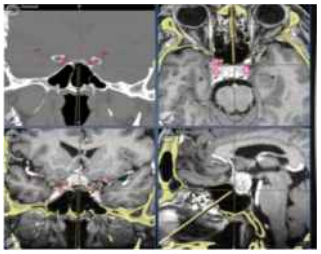
Localization of brain lesions and prevention of damage to vital structures are important in operation of brain pathologies for safe maximal resection of brain and spinal cord tumors. Despite development of many techniques including angiography, MRI, sonography, and frame based stereotaxy, a more accurate localizing technique, Neuronavigation systems have been developed for image-guided neurosurgery to aid in the accurate resection of brain tumors.

Today's navigation systems provide approximately 2mm accuracy. The technique involves accurately projecting computed tomography (CT) or magnetic resonance imaging (MRI) data into the operative field for defining anatomical landmarks, pathological structures and tumor margins.

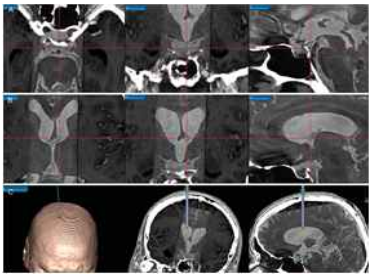
The main clinical utilities in modern neurosurgery are: localization of small intracranial lesions, skull-base surgery, intra cerebral biopsies, intracranial endoscopy, functional neurosurgery and spinal navigation.

Navigation can help accurate localization of important anatomic structures such as the carotid artery or cranial nerves, particularly if they are deep in the tumors, transsphenoidal pituitary surgery.

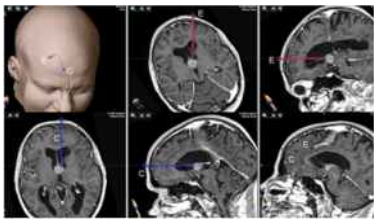
Transsphenoidal approach, sella floor is identified with accuracy,carotid vessels can be seen to avoid injury.



Navigation is incredibly useful in endoscopic procedures, helps to make more precise planned trajectories;for instance, to access through the foramen of Monro into the third ventricle avoiding damage to the fornix and also used in aqueductoplasty to choose the best approach to the aqueduct, intraventricular tumour biopsies, colloid cyst removals, and tumor extirpations.



Endoscopic colloid cyst excision, navigation helps to choose the correct trajectory enroute to third ventricle.



Functional neurosurgery, intracranial neurosurgical interventions in the deep brain structures regarding pain, extrapyramidal movement disorders, and particularly epilepsy are the classic indications for applying the frame-based technique. Navigation can also be successfully used in epilepsy surgery for localization and introduction of subdural strip and grid electrodes or for implanting deep-brain electrodes in the hippocampus.

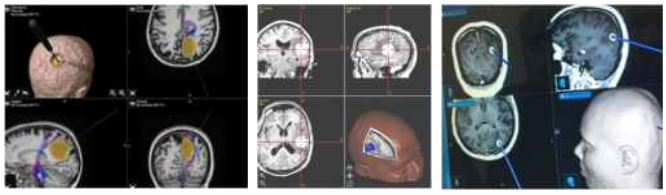
Drainage of abscesses guided by navigation can be done with precision.

The main clinical indication for computer-aided navigation in spinal surgery is the transpedicular insertion of screws in the thoracolumbar region

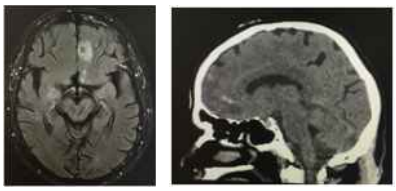
The neurosurgeon is able to calculate the localization and approach a small lesion accurately, therefore feeling more confident. The corticotomy is associated with less stress, particularly in eloquent areas such as the central region in some pathologies such as low grade gliomas. After opening the Dura, we will not be able to see superficial visible pathology. In such situations, we can find the right sulcus by using navigation device.

Glioma excision under Neuro navigation- choosing the exact craniotomy site, tumours close to eloquent areas can be excised safely.

Subcortical lesion excision with navigation- corticotomy site can be chosen to reach the lesion in small distance.



Navigation guided excision-sub centimetric lesion can be localised and excised with accuracy.



Navigation guided biopsy in multiple intracranial lesion. Navigation guided biopsy, post op CT scan showing blood streak and air pocket at the biopsy site. Navigation guided biopsy of lesion, post op Ct showing the biopsy site.

Future prospective:

Magnetic emitting source fixed directly to the patient's skull, producing a nonlinear magnetic field through the brain.

Navigational instruments are undergoing a process of evolution with many types developing due to different technical realizations.

Microsurgical robots: by injecting microsurgical robots through the vessels and synchronizing registration while observing the brain through various aspects from different points. By this route, signals can be transferred to a central computer out of the body. By integrating this information, a 3D map of different points of the brain and its pathologies can be formed.

Navigation system has some limitations in clinical applications and is expensive, time consuming calculation and registration, restriction of space and view inside the operating field,Intra-operative brain deformation (brain shift) limits the accuracy of image-guided neuro-surgery systems.However, most reports indicate that these devices are cost-effective, and may reduce surgical morbidity, and enhance outcome.

Congratulation ! !

DR.N.SENTHIL KUMAR

Consultant Radiologist

Receiving Best Radiology Administrator Award By Indian Express Healthcare and Radiology Education Foundation.

@ Radiology And Imaging Conclave 2018,

On 13th July 2018, New Delhi

Presented by

Dr. Bhavin Jhankaria, CEO-Picture This, Trustee- REF,Former IRIA President, Editor IJRI

Ms Viveka Roychowdhury, Editor, Express Healthcare

Mr.Rohit Sathe, President, Philips India

THE NEW ROYAL ICU.....

Intensive care units (ICUs) have become an integral part of the health care system since their widespread introduction more than half a century ago. Although an ICU is based in a defined geographic area of a hospital, its activities often extend beyond the walls of the physical space to include the emergency department, hospital ward, and out patient clinic.

An ICU provides a full spectrum of monitoring and life support technologies, serves as a regional resource for the care of critically ill patients, and may play an active role in developing the speciality of intensive care through research and education.

A new state-of-the-art, level 3 intensive care units (ICU) are on its way in our Royal Care Hospital , an

addition that was needed to meet the increasing demand of critical care patients admitted to the hospital. The 2 ICUs will have a total capacity of 25 beds. Both our ICUs features the most advanced technology, infrastructure and skilled care givers which are in par with western standards.

A multi-disciplinary team of specialists and experts at RCH worked for months to design and develop this ICU, specifically for critically ill patients.

The features of the state of the art level 3 ICU includes:

Therapeutic capacity

- Complex, comprehensive support and management of organ dysfunction

Personnel

- Physicians with formal ICU training and extensive experience available round the clock; consultant backup from other specialities 24/7
- Nursing staff with specialist ICU training provide 24/7 care
- Allied health personnel—respiratory therapists, physiotherapists, pharmacists, nutritionists, infection control nurses etc—as regular members of ICU team
- Nurse-patient ratio appropriate to patient needs and no less than 1:2
- Formal multidisciplinary ICU rounds in each shift (thrice daily) and as needed based on patient complexity and acuity
- Regular engagement in continuing medical/nursing education

Monitoring capacity

- Advanced monitoring of altered physiology as directed by clinical needs.
- Hemodynamic monitoring -Cardiac catheterization, Non- invasive cardiac output measurement
- Neuromonitoring- ICP monitoring, EEG, Trans Cranial Doppler
- Pulmonary-ABG, etCo2
- Blood gas analyzer and stat lab associated with ICU

Unit design and organ support

- Dedicated geographic area with individual patient care areas, central monitoring station, nutrition preparation areas with laminar flow, in house pharmacy and store with adequate stock.

- Advanced ventilator and hemodynamic support, continuous renal replacement therapy, capacity for tracheostomy and other basic surgical procedures
- Capacity for isolation of patients needing contact or airborne precautions
- New feature of electronic charting has been implemented to reduce the workload of nurses and physicians and to make the ICU paperless.

Integration within the hospital

- Outreach team(s), integration with step-down or high-dependency unit; close collaboration with emergency department.

Research and education

- Formal educational programs for staff
- Formal quality improvement program
- Active involvement in clinical research
- Training of residents and fellows as available

Responsiveness to regional and societal needs

- Referral resource for community and district hospitals and for other ICUs
- Disaster preparedness plan and capacity

Our extraordinary team of specialists, across many departments in the hospital, has worked countless hours designing, developing and now implementing this critical care unit to improve hospital stays, as well as outcomes for our patients.

Tasks are carried out with precision, synchronization and coordination by a multidisplinary team in ICUs with unwavering commitment and teamwork"

Dr. M.N.Sivakumar,
Head of Critical Care Department, RCH.

"Recognizing the need for an additional ICU, this new unit will greatly benefit our patients and their families. We are dedicated to ensuring excellence in critical care medicine throughout the hospital. With the latest addition of 25 new ICU beds, that brings the total number of ICU beds at RCH to 60"

Dr. Madeswaran,
Chairman, RCH.

DEPARTMENT OF MOLECULAR IMAGING AND RADIONUCLIDE THERAPIES PROUDLY PRESENTS STATE OF ART GE IQ PET/CT

Dr. A.C. Sureshkumar, DRM, DNB, FEBNM, MNAMS
Consultant Nuclear Medicine

Positron emission tomography combined with computerized tomography (PET - CT) is a non-invasive diagnostic procedure which combines small cellular changes in the PET with fine structural detail of CT allows for earlier and more accurate detection of disease.

Historical prospective:

The dawn of the PET era in India dates to 30th September 2002, with the inauguration of the 16-mega-electron-volt (MeV) hospital cyclotron facility and dedicated PET scanner at the Radiation Medicine Center (Bhabha Atomic Research Center) situated at the Tata Memorial Center in Mumbai. Followed by the country's first dedicated PET/CT scanner was inaugurated on December 13th 2004 at the Tata Memorial Center. Presently, there are more than 100 dedicated PET/CT units in the country.

Principle of PET

PET is based on the detection of pair of gamma rays (annihilation photons) emitted indirectly by a positron emitting radionuclides, such as F-18, carbon-11, and oxygen-15. These radionuclides are injected into the body with a biologically active molecule.Three-dimensional images of tracer concentration within the body are then constructed by computer analysis. In modern scanners, three dimensional imaging is often accomplished with the aid of a CT scan performed on the patient during the same session, in the same machine. This "anatomy-metabolic fusion" also known as Metabolic Imaging.

FDG is a most commonly used biologically active molecule for PET. It is an analogue of glucose, the concentrations of tracer imaged will indicate tissue metabolic activity by virtue of the regional

glucose uptake. Using this tracer to explore the possibility of cancer metastasis (i.e., spreading to other sites) is the most common type of PET scan in standard medical care (90%). Now, many other radiotracers are used in PET to image the tissue concentration of many other types of molecules of interest.

In our centre we have GE discovery IQ PET-CT. It has a new PET detector technology called Light Burst technology. This innovative detector high technology is paired with optima CT540 system. It provides quality images with lesser radiotracer dose and scan times.

Clinical Indications	
Oncolgical	**Non oncological**
• Staging (especially in N and M staging) • Treatment response evaluation • Detection of unknown primary • Metabolic biopsy • Restaging, Prognostication, Risk stratification & Therapeutic decision making • Planning of Radiation therapy • Post treatment Follow up & surveillance	• Pyrexia of unknown origin (PUO) • Osteomyelitis and Malignant otitis externa • Vascular graft - related infection and prosthetic valve infection • Treatment response evaluation: Tuberculois, Sarcoidosis and vasculitis • Hip and knee prosthetic infection • Cardiology – Myocardial viability assessment • Neurology – Dementia and localisation of epileptogenic focus • Neuropsychiatry

Patient Preparations
◆ Fasting - 6 Hours ◆ Blood sugar <150mg/dl ◆ No intravenous dextrose at least for 6 hrs ◆ No strenuous exercise for 24 hrs ◆ No subcutaneous insulin for 6 hrs

Standardized Uptake Value (SUV):

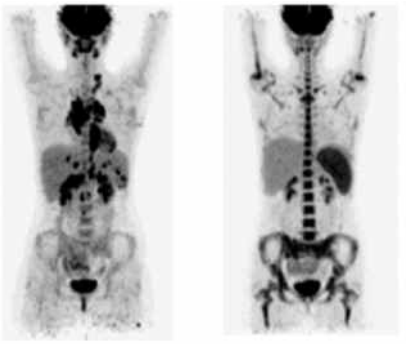
It is a simplistic semi quantitative method to quantify tracer uptake in the PET imaging. An SUV of 2.5 or higher is generally considered to be indicative of malignant tissue; however, there has been a wide range of SUVs reported for similar diseases.

SUV is dependent on many patient-related factors including the ROI defined, the activity injected, plasma glucose levels, competition with endogenous glucose, rate of phosphorylation, body size and body composition, as well as tumor type. Technically, SUV values will vary depending on the PET scanner's signal-to-noise properties, the accuracy of the image reconstruction algorithm as well as corrections algorithms, and the time between injection and image acquisition.

Benefits and short comings :

FDG-PET CT scan imaging serve to identify primary or metastatic or paraneoplastic disease and monitor response to therapy.

Therapeutic response evaluation



Staging Post Chemotherapy

For most malignancies, FDG-PET will be helpful in the setting of suspected or proven recurrence. Its utility in the primary setting depends on the availability and information derived from structural imaging studies. Some primary malignancies show relatively low uptake of FDG, which reflects their low glucose metabolism, lower expression of glucose transporters, a high rate of FDG dephosphorylation (e.g., hepatocellular carcinoma), and the histologic composition of the lesion.

Most well-differentiated malignant tumors, including differentiated, iodine-avid thyroid cancer, many primary prostate and renal cancers, also show low FDG uptake.Indolent lymphomas also show relatively low FDG uptake. As these

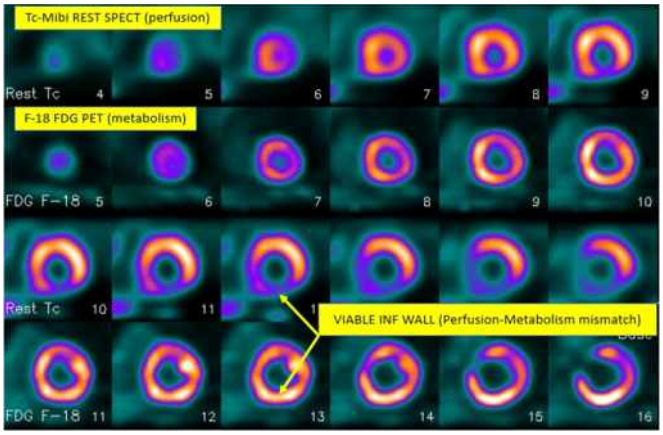
malignancies become more aggressive and clinical disease progresses, they will become detectable on FDG PET, and it can then help in monitoring the response to chemotherapy or experimental therapies (e.g., in castration-resistant metastatic prostate cancer) and also provide prognostic information.

False-positive findings may occur due to increased glucose metabolism and FDG uptake within brown adipose tissue, a normal variant, in various granulomatous diseases such as sarcoidosis, in some benign tumors (e.g., paragangliomas, benign bone lesions such as eosinophilic granuloma, nonossifying fibroma, Paget's disease), at sites of infection, or in nonspecific inflammation. Sometimes presents a problem when PET imaging is done too early after the end of radiation (earlier than 10 weeks) or chemotherapy (earlier than 2 weeks).

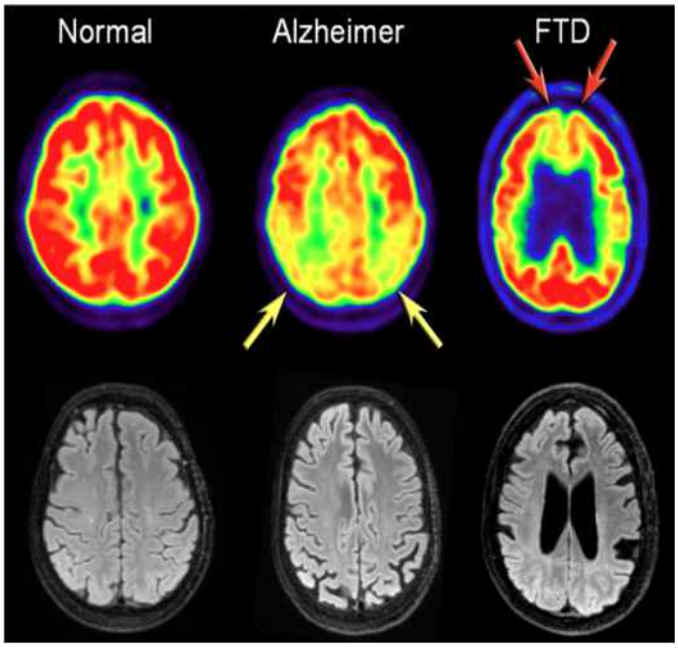
Apart from its heavy use in clinical oncology, FDG PET-CT is widely used in a variety of non-oncologic conditions interconnecting to such disciplines as general internal medicine, infectious diseases, cardiology, neurology, surgery, traumatology, orthopedics, pediatrics, endocrinology, rheumatology, psychiatry, neuropsychology, and cognitive neuroscience.

The inflammatory cells have18F-FDG avidity led to the concept of using FDG PET-CT for imaging a variety of inflammatory and infectious conditions, including granulomatous diseases and fungal infections.

In the heart, FDG uptake by the myocardium allows assessment of myocardial viability in patients with myocardial ischemia, revealing potential regions of hibernating but viable myocardium. In patients with cardiac sarcoidosis, FDG PET has proven useful as a follow-up tool for disease monitoring.



In the brain, FDG uptake by the cortical and subcortical structures allows noninvasive quantification of cerebral metabolism and may provide valuable information before any morphological changes become discernible. Current evidence in patients with epilepsy indicates that FDG PET may provide crucial data that guide surgical resections of the epileptogenic zone for medically refractory epilepsy. The brain FDG PET is an effective and safe modality to identify diagnostic patterns of glucose hypometabolism in neurodegenerative dementias and is an effective and useful adjunct to other diagnostic information in the assessment of patients with progressive cognitive impairment.



However, despite the expanding areas of FDG PET applications in non-oncologic disorders, new prospective studies are needed to determine the place of FDG PET in the diagnostic work-up of many of these conditions.

Conclusion:

Although PET/CT still is a relatively new medical imaging technique, it's clinical applications are rapidly expanding and involving many clinical disciplines and area of research. It is becoming the preferred method for whole body oncology imaging and will play an increasingly important role in molecular imaging in clinical practice.

GIANT CELL TUMOR OF DISTAL FIBULA - UNIQUE MANAGEMENT

Dr. Dinesh Chidambaram
MS Ortho., FOTS., FASM
Consultant Trauma & Arthroscopy Surgeon, Shoulder & Knee Specialist

Dr. C. Karthikeyan
MS (Ortho), DNB (Ortho), MRCS (ED), Fellow in Arthroscopy
Consultant Orthopaedic Surgeon (Specialist in Arthroscopy and Sports Injuries)

Dr. Prakash Sengottaiyan
MS, M.Ch (Plastic)
Consultant Plastic and Cosmetic Surgeon

25 year male patient came to our hospital with complaints of pain and swelling over the outer aspect of left ankle for the past one year. On examination there was a diffuse swelling over distal third fibula with classical egg shell cracking consistency. Imaging with X ray, CT and MRI revealed eccentric, expansile, lytic lesion with cortical breech. Thus a preoperative diagnosis of "Giant Cell Tumor" was made. Trucut biopsy done.

As a part of preoperative workup, Chest X-ray and CT-Chest were taken to rule out pulmonary metastases and it was normal. Trucut Biopsy revealed features suggestive of GCT.

Locally aggressive tumor in an expendable bone warrants resection of distal fibula to prevent recurrence, which compromises ankle stability. So we did wide resection of the distal fibula and reconstruction of the ankle mortise with ipsilateral proximal fibula. Biceps femoris tendon and LCL were secured with suture anchor to proximal tibia to avoid knee instability.

Excision biospy revealed Giant cell tumor with margins free of tumor invasion. At one year follow up, there is no recurrence locally. His knee and ankle range of movements were normal. Mean MSTS score was 100.

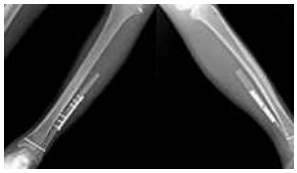









GCT involving Distal fibula is very rare. Owing to high recurrence rate, resection of tumour in toto and to enable the patient with good ankle stability, reconstruction of ankle mortise with ipsilateral Proximal Fibula is an appropriate mode of management especially in young patients.






Royal Care Welcomes...

Dr. A. Mohanakrishnan, MD, DM (Gastro)
Consultant Medical Gastroenterologist

Completed MBBS in 1990 from Coimbatore Medical College and MD in Internal Medicine from Kilpauk Medical College in 1996. He has completed his DM in Gastroenterology from Kilpauk Medical College in 2001. He was Assistant Professor of Medicine for 3 years in Sri Ramachandra Medical College, Chenai. He has worked as Consultant in few hospital in Coimbatore and Tirupur for 8 years and 5 years in PSG Institute of Medical Sciences as Associate Professor of Gastroenterology for 5 years.

Dr. M. N. Sivakumar, DA, DNB, IDCCM, EDIC
Consultant Intensivist Head - Dept of Critical Care Medicine

Dr.Sivakumar completed his MBBS from Coimbatore Medical College, DA from JJM medical college and DNB Anaesthesia from KMC Hospital. He also completed his Indian Diploma in Critical Care medicine from Sundaram Medical Foundation under the tutelage of Dr. Ram.E Rajagopalan. In the year 2014, completed his European Diploma in Intensive Care Medicine. He headed the Critical Care team in KMCH Hospital for the last 12 years before joining Royal care.

Dr. T.A. Senthilnathan, MBBS, MD, DNB, EDIC
Consultant Intensivist

Completed MBBS in 1995 from Coimbatore Medical College then MD (Aanaes) from PGIMS, Rohtak, Haryana in 2002. Subsequently he joined as Senior Resident at AIIMS, New Delhi and completed in 2005. Has worked as Junior Consultant at Max Super Speciality Hospital, New Delhi before relocating to State of Kuwait as a Senior Specialist in the Dept. of Anaesthesiology and Intensive Care at Al Jahra Hospital. He has acquired European Diploma in Intensive Care from Belgium in 2014 and ECFMG certification from USA in 2016.

Dr. P. Vivekanandan, DA, FRCA, EDIC, FFICM (UK),
Consultant Intensivist

Dr. P. Vivekananthan has completed MBBS in 1994 and Diploma in Anaesthesia in 1998 from SMS Medical College, Jaipur. He had worked as Senior Registrar in ICU from 2002 to 2007 at UK and also obtained FRCA from Royal College of Anaesthesia, London. He has also acquired Certification of completion of Specialist Training in Anaesthesia in 2007, EDIC (European Diploma in Intensive Care in 2009 and FFICM (Foundation Fellow in Intensive Care Medicine) in 2011. He has held various various positions as Consultant in Anaesthesia and Intensive Care, Clinical Lead for Intensive Care, GMC revalidation lead, Clinical lead for Organ donation.

DR. P. Nandakumar, MBBS, DA, DNB, IDCCM
Consultant Intensivist

Dr. Nandakumar had obtained both MBBS and DA from JJM Medical College, Davangere in the year 2001 and 2005 respectively. Subsequently he joined for DNB anaesthesia at KMCH and completed in the year 2011. To his credit he acquired IDCCM in year 2014. He has 13 years of experience in the field of Critical Care medicine.

Royal Care Welcomes...

Dr. R.S. Senthilkumar, MBBS, MD, IDCCM, EDIC
Consultant Intensivist

Dr. Senthilkumar has done his Medical Graduation from Madras Medical College Chennai in 2002. Later he joined in Shri B.M. Patil Medical College, Bijapur, Karnataka and completed MD Anaesthesia in the year 2006. Subsequently he completed IDCCM in KMCH in the year 2009. He has been working as Consultant Intensivist in KMCH and acquired his European Diploma in Intensive Care Medicine in 2014.

Dr. Nandakumar. V MBBS, MD, IDCCM, EDIC
Consultant Intensivist

Dr. Nandakumar procured MBBS in 2004 from Ramachandra Medical College, Chennai and finished MD anaesthesia in JJM Medical College, Davangere in 2009. He completed Indian Diploma in Critical Care Medicine from SMF Chennai in the year 2011. Subsequently he acquired his EDIC in the year 2014. He has 10 years of experience in the field of Critical Care Medicine.

Dr. Lakshmikanth Charan. S MBBS, MD, IDCCM, EDIC
Consultant Intensivist

Dr. Charan completed MBBS in 2008 from PSG Institute of Medical Science and Research and MD anaesthesia in 2011 from Kasturba Medial College, Manipal University. He has obtained critical care Diplomas - Indian Diploma of Critical Care Medicine (IDCCM) from Indian Society of Critical Care Medicine in 2012 and European Diploma in Intensive Care Medicine (EDIC) in 2015. He has 7 years of experience in the field of Critical care Medicine.

Dr. N. Premalatha, MBBS, DGO, MRCOG (UK), DIUI (France)
Consultant Obstetrician and Gynaecologist

Obtained MBBS from Coimbatore Medical College in 1998, on obtaining DGO from Madurai in 2003 she moved to U.K. and obtained MRCOG from the Royal college of Obstetricians and Gynaecologist in London and subsequently obtained the International University Diploma in Gynaecological endoscopy from the University of Auvergne, Clermont Ferrand in France.

Dr. Arunandhi Chelvan, MBBS, MS, M.Ch
Consultant Surgical Oncologist

Completed MBBS in 2006 from Rajah Muthiah Medical College and MS (General Surgery) from KMC, Manipal in 2010. He has completed M.Ch (Surgical Oncology) from Cancer Institute WIA in 2015. Before joining Royal Care Super Speciality Hospital, he was the visiting consultant for few hospitals in Erode.

Royal Care Welcomes...

Dr. A.C. Sureshkumar, DRM, DNB, FEBNM, MNAMS
Consultant Nuclear Medicine

Completed MBBS from K.A.P.Vishwanathan Govt medical college,Trichy in 2006. He completed Diploma in Nuclear medicine (DRM) from Tata Memorial hospital, Mumbai in 2010 and DNB (Nuclear medicine) from Apollo Hospitals, Chennai in 2014. He has obtained fellowship in nuclear medicine from European board, Italy. He worked as consultant and department In charge at Amala institute of medical sciences, Thrissur before joining with Royal care.

Dr. Sabarieswaran. R.K, MBBS, MD, DNB, PDCC, MNAMS
Consultant Anaesthetist

Completed MBBS in 2011 from Tirunelveli Medical College and Masters Degree in Anaesthesiology and PDCC (Cardio & Neuro Anaesthesia) from JIPMER in Mar 15 & Jun 16 respectively. He has obtained DNB in Oct 2016. He has also completed MNAMS from National Accademy of Medical Science in Jun 18.

Dr. K.S. Elavarasan, MBBS, MEM
Consultant Emergency Physician

Completed MBBS in 2011 from Thoothukudi Govt Medical College, and completed Masters in Emergency Medicine in 2017 from PSG Institute of Medical Sciences & Research Hospitals, Coimbatore. He was the Consultant in Emergency Medicine of a corporate hospital in Coimbatore, prior to joining Royal Care Super Speciality Hospital.

Dr. P. Nalini Arunkumar, MBBS, MD (OG),
Associate Consultant Obstetrician and Gynaecologist

Completed MBBS from Coimbatore Medical College in 2002 and has completed MD (OG) from Madurai Medical College in 2008. During her career over a decade, worked with corporate hospital in Kerala and Tamilnadu. She has also trained in Gynaec Laparoscopy and Infertility Ultrasound.

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- Endogynecology (Laparascopy)
- ENT, Head & Neck Surgery
- General & Laparoscopic Surgery
- Fertility Care Clinic
- Internal Medicine & Diabetology
- Interventional Pulmonology
- Interventional Radiology
- Master Health Checkup
- Medical Gastroenterology
- Medical Oncology
- Minimally invasive spine surgery
- Nephrology
- Neurology
- Neurosurgery
- Nuclear Medicine
- Obstetrics & Gynecology
- Orthopaedic & Trauma Surgery
- Ophthalmology
- Plastic, Reconstructive & Cosmetic Surgery
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- Paediatric & Neonatal Surgery
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