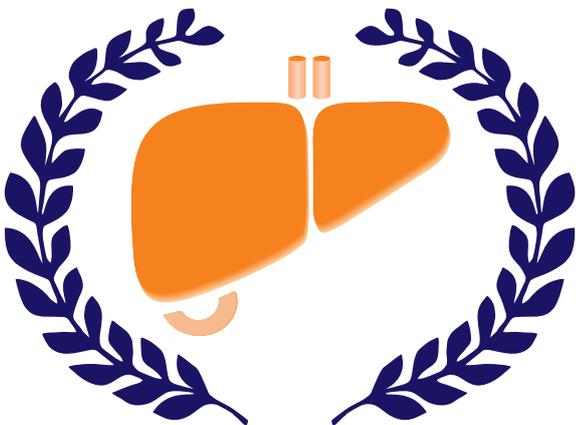


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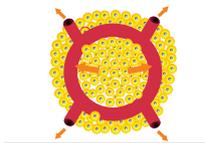
Medical Journal from Yashoda Hospitals

Volume: 10

Excellence in **LIVER** TRANSPLANTS

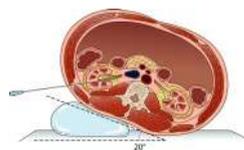


- My Reflections: A Decade of Vascular Surgery Expertise
- Liver Transplant Outcome: Case Selection & Timing Of Referral Are The Keys
- Multiple Endocrine Neoplasia Type 1 (MEN1)
- Partial Knee Replacement
- Laparoscopy in Small Bowel Obstruction: Indications, Feasibility and Benefits
- ABO Incompatible Renal Transplantation
- Diaphragmatic Spindle Cell Sarcoma : A Rare Giant Tumour
- Percutaneous Nephrolithotomy in the Supine Position: Initial experience at our Center
- Hysteroscopy: A Necessity In Modern Gynaecology
- Small-for-gestational-age versus appropriate-for-gestational-age: Comparison of Cord Blood Lipid Profile and Insulin in Term Newborns
- Mediquiz



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Editor's Insight

The entire medical fraternity of Hyderabad, and for that matter, the whole of India was shocked for a moment when the news came that the vaccine-derived polio virus (VDPV) type 2 was detected in a sewage sample collected from a site in Hyderabad. The resurfacing of polio cases presents a glimpse into the gross realities and challenges India's healthcare industry confronts today.

Yashoda Hospitals, the most trusted healthcare provider of the region, addresses the medical and healthcare challenges by achieving a synergy of quality patient care, best team of doctors, latest procedures, advanced technology and comprehensive facilities. Some of the phenomenal sparks of change witnessed this year in the direction to realize quality care and patient satisfaction are presented in this edition of Insight.

Dr. Devender Singh shares a few memorable moments gathered from his decade-old work as a vascular surgeon at Yashoda Hospitals. He also shares his experiences in the successful management of Peripheral Vascular Trauma.

Dr. Harikumar Nair talks about the importance of timing of referral for a Liver Transplant.

With the development of imaging studies, the diagnostics of neuroendocrine tumors improved and now it is possible to identify more patients with MEN (Multiple Endocrine Neoplasia) Syndrome. In the case study presented by Dr. Sreekanth K, the treatment and diagnosis as followed by the multi-disciplinary team of doctors (Oncologists, Endocrinologists, Radiologists and Pathologists) for MEN, is elaborated.

Dr. Sunil Dachehalli, elaborates on the advantages of Partial Knee Replacement, where the hospitalization is shorter and rehabilitation and return to normal activities is faster.

Dr. M. N. Pavan Kumar, elaborates on the distinct advantages of Therapeutic Laparoscopy in the diagnosis and treatment of Small Bowel Obstruction, with the assurance on early recovery and shorter hospital stay.

Dr. Urmila Anandh speaks about how with the advent of newer medications, ABO incompatible transplants are quickly becoming a reality.

In the case study on Diaphragmatic Spindle Cell Sarcoma: A Rare Giant Tumour, Dr. Sachin Subhash Marda provides details of the primary diaphragmatic tumour occupying the left lower chest and the upper abdomen.

A group of Urologists (Dr. Naveenchandra Acharya, Dr. Vamsi Krishna, Dr. Priyank Salecha, and Dr. Rohit Muvva) present an in-depth analysis of the safety and efficacy of supine PCNL for managing large renal stones (up to 2.5 cm), with special focus on evaluating the complications.

Dr. Revathy Ramaswamy speaks about the importance of a Hysteroscopy and how it has become necessary in today's world.

Dr. Uday Kumar and a research team presents a comparison of cord blood lipid profile and insulin levels in term newborns (SAGA ACT Study).

At this juncture, I consider it an esteemed privilege to welcome all consultants and surgeons who have joined Yashoda Hospitals recently. As Helen Keller said, "Alone we can do little, together we can do so much," it is definitely team work that made Yashoda Hospitals a leader in quality healthcare in the region.



Dr. R. Chandrasekar

MBBS (JIPMER), MD Radiology (JIPMER)

Fellow in Advanced Imaging (NIMS)

MHA (ICFAI), PGDMLE (NLSIU)

MBA Business Strategy and Leadership (ISB)

Editor, Insight Magazine

Executive Vice President, Yashoda Hospitals



Blocked blood vessels lead to loss of limbs

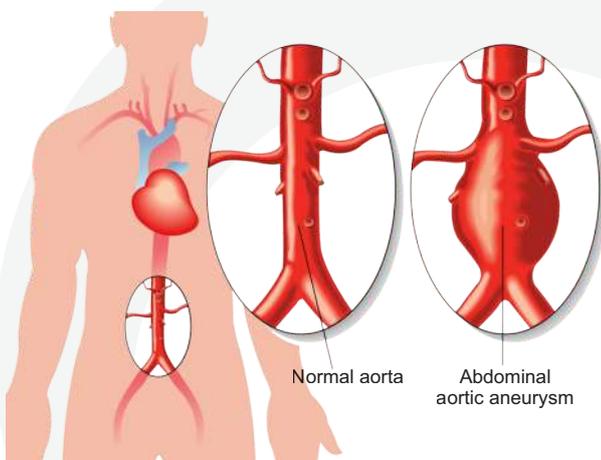


Dr. Devender Singh
MS, DNB, FIVS (UK)
Vascular & Endovascular Surgeon

My Reflections: **A Decade of Vascular Surgery Expertise**

I consider it my privilege to share with you, a decade long experience in vascular surgery, the changes I have witnessed, and the benefits of vascular technologies that are fast changing the effectiveness of vascular treatments and surgeries. Significantly, I received a great part of my learning and experience at Yashoda Hospitals where I have been exposed to precise anatomical procedures, intervention and deployment of critical tools such as X-rays, contrast media, graft materials, sutures, intravenous solutions and blood banking.

As I understand, vascular surgery, its theory and practice have evolved with the introduction of new and innovative technology. The day when vascular surgery was considered as "the surgery of relics" finds no relevance now. The benefits of vascular technology is evident as new pills and drugs that are greatly safer, vaccines that are more effective against neoplastic disease than earlier, therapies employing DNA microarrays are becoming quite common and revolutionizing treatment of vascular disorders. Nanotechnology has introduced tools that help in working on objects one billionth of a meter, which means new treatments and procedures for vascular disorders.



The minimally invasive surgical procedures have brought vast changes in vascular surgery, with the promise of functional lives and livelihoods. The endovascular procedures for aortic aneurysm take into consideration the best of the past and latest practices. For example, the endovascular stent graft is placed inside the abdominal

aorta to strengthen it and keep it from rupturing. Significantly, the stent graft is placed without opening of blood vessel on removing any tissue. Also, today the simple segmental occlusions are better managed by endovascular technology; however a comprehensive treatment plan that equally focuses on nutrition and lifestyle should be followed.

Amputations in the past were considered as the only treatment for diabetic patients and also in a vast majority of accident patients sustaining vascular injuries. Now with the concept of limb salvage with good revascularisation procedures, in a majority of patients, the limbs are saved with almost normal function. There is a tremendous improvement in the quality of life for these patients.

Vascular surgery has moved from excision to practice of minimally invasive procedures. Earlier, as a resident in surgery, I had to do, rather unhappily the bloody varicose vein operation, making multitude incisions through the limb to extract the branching varicose veins. Now as a vascular surgeon, I no longer extract veins, but beneficially use radiofrequency energy or laser and achieve results through tiny incisions or punctures. The blood loss is insignificant, pain and discomfort are very less, with the patient discharged and allowed to go home within few hours of surgery. Today, it is also possible to achieve effective thrombolysis.

However, the use of technology to further vascular procedures needs careful consideration as out-of-control technology is a matter of concern. I am personally proud to be associated in this wondrous profession as a vascular surgeon and the support provided by Yashoda Hospitals in recognizing vascular surgery as an independent speciality is commendable. More importantly, the confidence of other medical professionals in accepting this speciality certainly boosts our confidence levels and helps us to serve our patients in a better way.





Dr. Harikumar R Nair
MD, MRCP(UK), DM, FRCP(Edin)
Hepatologist

Liver Transplant Outcome: **Case Selection & Timing Of Referral Are The Keys**

Introduction:

Cirrhosis of liver in India has seen a progressive increase in incidence over the past few decades¹. Principal contributors to this incremental incidence is an unmasking of the genetic predilection for Metabolic Syndrome (MetS) coupled with widely prevalent unhealthy dietary and lifestyle factors including alcoholism. It would be pertinent to point out that both these factors are the result of socio-economic progress in the country. Asians have an inherent genetic predilection for metabolic syndrome which includes visceral obesity, dyslipidemia, hypertension and diabetes. A sedentary lifestyle along with the diet which is rich in refined carbohydrates and fats has fuelled the rise of metabolic syndrome and Non Alcoholic Steato Hepatitis (NASH) in India, 8-10 % of which progress to cirrhosis.

The healthcare sector in Kerala has developed in parallel to the economic development resulting in a larger pool and hence, easier access to qualified specialist health care practitioners which increases the likelihood of a cirrhotic getting channelized towards the transplant track at the right time. However, the exponential rise of Diabetes and metabolic syndrome in the country, both which playing causal role in cirrhosis of liver, will only lead to a more central role for internists and even the primary care physicians, in the diagnosis and management of chronic liver disease. There exists a tangible and unmet need to equip these healthcare professionals with the "standard of care" practices and guidelines of when to refer a patient for transplant evaluation².

Long Term Management Of Cirrhosis & Timing Of Transplant Referral

Every chronic liver disease (alcoholic, non alcoholic, viral or autoimmune) eventually progresses to cirrhosis with the passage of time. However, this progression is largely asymptomatic and hence, physicians must actively keep a watch on subtle early features of cirrhosis with regular blood work and periodic imaging.

Once cirrhosis sets in, it is a progressive disease usually culminating in death unless, transplantation is performed. The median survival of compensated cirrhosis is 12 years and decompensated cirrhosis is 2-4 years. The transition from a compensated to decompensated phase occurs at approximately 5-7% per year and can be divided into stages:

Stage 1- Absence of esophageal varices or ascites.

Stage 2- Varices have formed but ascites is yet to develop.

Stage 3- Onset of ascites

Stage 4- Variceal bleed with or without ascites.

Stage 1 & 2 are compensated phases while stages 3 & 4 are decompensated phases. Ascites is the most common first presentation of decompensation. The division of these stages has prognostic significance as reflected by the mortality rates which range from 1% for stage 1 to 57% for stage 4. The rate of progression of cirrhosis is variable and can roughly be estimated to 10% per year³. Nearly half the deaths in stage 4 occur within 6 weeks of portal hypertensive bleeding. In addition to this eventual decompensation, Hepato Cellular Carcinoma(HCC) can complicate the course of illness at 3% per year and can occur in any stage. Though HCC is not defined as a decompensating event, detection of the same necessitates referral to a hepatologist for transplant evaluation and/or locoregional ablation therapies like Radio Frequency Ablation (RFA), Transarterial Chemo Embolisation (TACE) and Transarterial Radioembolisation (TARE).

In short, long term management of Cirrhosis includes regular assessment of the stage of the disease and appropriate timing for transplant referral. Patients and the care-giving physician must recognize the fact that survival rapidly dwindles for patients once they enter the decompensation phase. More importantly, they need to understand that beyond a certain point while following up a decompensated disease, the outcomes of transplantation will also be adversely affected, progressively towards futility. This tipping over point or optimal time of referral does matter a lot. Akin to late referral, a too early transplant is equally not justifiable. Referral should not be done if the patient has sufficient functional parenchymal reserve and low portal pressures so that his one year mortality is less than 10%, which happens to be peroperative mortality during transplant surgery in the best of world centers. If projected one year mortality as pointed out by Child and MELD scores is more than 10 percent, then it is justified to embark on transplant surgery which has 10% mortality. One needs to understand that even after recovery from transplant surgery, the patient will not have the same life span as his or her age and sex matched counterparts in general population. Instead, the transplanted patient is put in a time bound survival track of 90-95% at 1 year, 85-90% at 5 years and 60-70% at 10 years. These survival figures are related to adverse effects of immunosuppression, namely, accelerated metabolic syndrome(Post Transplant Metabolic Syndrome; PTMS), more predilection for malignancies and immunosuppressive medication induced chronic kidney disease(CNI Nephropathy)⁴.

To put in a nut shell, the decision to refer a cirrhosis case for transplant at⁴ the optimal time, weighing the survival benefit versus perioperative mortality, short term and long-term morbidity, poor outcomes of late referrals and disadvantageous situation of curtailed lifespan in case of too early referral, indeed is a delicate balancing act.

Success Of Liver Transplantation

Over the last two decades, liver transplantation has evolved from an experimental procedure to the standard of care for end stage liver disease. The survival rates for these patients are excellent with most studies showing a 90-95% survival at 1 year, 85% at 5 years and 60-70% at 10 years. However, these figures are subject to optimal timing of transplantation, precise protocol driven selection of patients looking at absolute and relative contraindications and meticulous long term post-transplant care centered round tailor-made immunosuppression, management of post-transplant metabolic syndrome and cancer surveillance, delivered by a trained liver transplant physician⁵.

There has been a remarkable increase in the number of transplants across the major cities in India, but this rise has not been in proportion to the drastic increase in the incidence of cirrhosis thereby creating a wide disparity. The important bottle necks are an absence of a robust dead donor program, the unavailability of a suitable living donor and financial constraints especially in the absence of a third party benefactor or government funding. In addition, late referral beyond the point where transplantation cannot yield any meaningful outcome results in increased post-transplant morbidity and poor post-transplant survival. However, late referral is a modifiable factor easily offset by creating awareness in the referral network with regard to optimal timing for pre-liver transplant evaluation.

Importance Of Timing Of Referral For Transplant Evaluation

Referral to a liver transplant physician is just the first step in an exhaustive, long drawn pre-transplant evaluation process. Numerous modifiable factors would be detected during the evaluation process, including cardiopulmonary factors like porto-pulmonary hypertension. If the patient is malnourished and "sarcopenic", nutritional therapy to optimize the patient for transplant surgery is another situation which leads to delay in transplantation. If the potential living related donor has significant steatosis, diet and lifestyle modification to optimize the graft will prove to be time consuming.

Therefore the initial referral must happen when the patient is well enough to undergo evaluation and listing but at the same time decompensated enough to consider transplant intervention. In other words, referral must take place sufficiently early to incorporate adequate time for an exhaustive evaluation and to institute subsequent optimization strategies in order to achieve best possible post-transplant outcomes⁷.

Objective Guideline For Referring, Based On Severity Of Disease

Severity of cirrhosis as assessed by Child-Turcotte-Pugh scores (CTP) or Model for Evaluation of End stage Liver Disease (MELD) scores are objective ways for early referral. This CTP score employs five clinical measures of liver disease. Each measure is scored 1-3, with 3 indicating the

most severe derangement⁶.

Measure	1 point	2 points	3 points
Total bilirubin, (mg/dl)	(<2)	(2-3)	(>3)
Serum albumin, g/dl	>3.5	2.8-3.5	<2.8

PT INR	<1.7	1.71- 2.30	> 2.30
Ascites	None	Mild	Moderate to Severe
Hepatic encephalopathy	None	Grade I-II (or suppressed with medication)	Grade III-IV (or refractory)

POINTS	CLASS	ONE YEAR SURVIVAL	TWO YEAR SURVIVAL
5-6	A	100%	85%
7-9	B	81%	57%
10-15	C	45%	35%

MELD is a mathematical score determined by using the following laboratory measures: Serum creatinine, prothrombin time – INR (International Normalized Ratio) and serum bilirubin. Online calculators or smart phone applications are an easy avenue for the calculation of MELD score. MELD ranges from 6–40 and an individual score equates to a 3 month mortality as follows:

MELD	3 months mortality
> 40	71.3
30-39	52.6
20-29	19.6
10-19	6
<9	1.9

Criteria for optimal timed referral for best outcomes

- 1 Child- Pugh score (CTP) > 7
- 2 Model for Evaluation of End stage Liver disease (MELD) > 15
- 3 First decompensation event (Ascites, variceal bleed, hepatic encephalopathy)
- 4 Any space occupying lesion/ Hepatoma in Imaging (USG / CT)

Indications For Liver Transplant⁸

Cirrhosis liver with first episode of decompensation (stage 3 & 4) warrants evaluation by a liver transplant physician. Apart from decompensation of liver function, another indication for transplant referral is Hepatocellular cancer (as diagnosed on imaging as a space occupying lesion on USG Abdomen or typical CT findings).

Absolute Contra Indications

1. Cardio-pulmonary diseases

A meticulous evaluation to look for significant coronary artery disease with dobutamine stress echocardiography in all and coronary angiogram in selected cases is a standard protocol followed in most transplant centers. A 2D echocardiogram to look for features of Porto-pulmonary hypertension (PPH) is usually a good screening tool. PPH in its severe form is diagnosed by right heart catheterization and pressure measurements. It is an absolute contraindication for liver transplantation. Hepatopulmonary syndrome (HPS) as diagnosed by agitated saline contrast echocardiography is an indication for transplantation owing to post-transplant reversibility. However, severe HPS is associated with high peri-operative mortality.

2. Sepsis / Active infection

Since immunosuppressive medications are given immediately after transplant, active infection if present at the time of transplant will progress to severe and often fulminant infections. Clinical situations like Spontaneous Bacterial Peritonitis (SBP), Cholangitis in case of Chronic Cholestatic Liver Diseases like primary Sclerosing Cholangitis & recurrent Pyogenic Cholangitis should be carefully evaluated after adequately treating the infection with broad-spectrum or an appropriate culture sensitive antibiotic

3. Extra hepatic malignancy

An untreated extra hepatic malignancy is an absolute contraindication. Those with a past history of malignancy may be considered for transplantation if the malignancy was treated 2-5 years before the transplant evaluation. (variability exists between various malignancies)

4. Active Substance abuse

Alcohol or any other ongoing recreational drug use is an absolute contraindication. In alcoholic liver disease, a 6 month period of abstinence is mandatory in most transplant centers world over.

Relative Contra Indications

1. Advanced age:

As age advances, there is an increased possibility of complications owing to a progressive decline in cardio-pulmonary reserve. Most centers keep an age cut-off of 65-70 years. However, a significant degree of flexibility is exercised, particularly if the patient is physiologically younger than his/her chronological age.

2. Obesity:

Obesity causes technical problems during surgery and an increased rate of post surgical complications. Most transplant centers keep a BMI of 40 as cut-off.

3. History of poor adherence to medications: Poor social support and major psychiatric illness

4. Malnutrition and fraility:

Advanced cirrhosis is associated with loss of muscle mass (sarcopenia). Sacropenic patients tend to have prolonged stay in the ICU and poor post operative outcome. Hepatic sacropenia worsens due to late referrals and strict adherence to prevalent traditional beliefs regarding dietary restriction in liver diseases.

Hepatoma Surveillance

Given the fact that 80-90% of hepatomas occur in the setting of cirrhosis, internists and primary care physicians should understand the importance of 4-6 monthly ultrasonography surveillance to look for Hepatocellular carcinoma. Loco regional ablation therapies like Radiofrequency Ablation (RFA) & Transarterial Chemo Embolization (TACE) are available in select centers in India. Lesions identified at a smaller size (2-3 cm) have better results with these therapies. Also, contrary to popular misconception, hepatocellular cancer is an indication for liver transplant as long as it fits into the Milan criteria (A single lesion between 2-5 cm or up to 3 lesions largest measuring 3 cm with no lymphatic or vascular invasion)^{9,10}.

Inevitable Delays During Evaluation And Optimisation Of Liver Transplant Recipients And Donors Necessitate Early Referral⁷

Liver transplantation indeed is an elixir of life for prolonging survival in cirrhosis, long considered a chronic disease with no cure. The first step before referral to a transplant center is to diligently dissect the indication for transplantation and weigh the mortality and morbidity associated with declining hepatic reserve to that incurred during surgery and the attendant post-surgical complications^{8,11,12}. The liver transplant surgery itself carries a mortality of 10% with significant morbidity-post operative as well as long term medical complications (infections, malignancy, accelerated metabolic syndrome and macro vascular complications, immunosuppression associated renal damage) which culminates in financial and emotional burden. After approval of the indication, the second step would be to identify absolute contradictions. The final step is to identify modifiable factors in recipient and potential living donors, which may influence post-transplant outcomes and employ optimization strategies.

Examples of Evaluation & Optimization delays

1. Alcoholic liver disease :- Ensure 6 month of abstinence. Facilitate referral to a de-addiction unit and self help groups like Alcoholics Anonymous (AA). Resurgence of alcoholism post-transplant is wasteful of resources.
2. Obesity: - If BMI > 40, weight reduction should be advised. Obese recipients have poor postoperative outcomes.
3. Malnutrition, Sarcopenia – Dietary and physiotherapy inputs.
4. Cardio-pulmonary issues need to be addressed like CAD needing an angiogram, Porto-pulmonary hypertension should be evaluated with reversibility assessment and adequate management of hepatopulmonary syndrome including home oxygen therapy if indicated.
5. Stop Smoking: Smoking enhances risk of malignancies post-transplantation due to immunosuppression which provides a conducive environment for neoplastic transformation.
6. In Cirrhosis due to HCV/HBV – Antiviral therapies have to be initiated and optimised before transplant to prevent post-transplant recurrence.
7. HCC should be subjected to locoregional ablation therapies like RFA / TACE as a bridge to transplant in cases which are listed for DDLT.
8. donor steatosis > 20 % as assessed by imaging (+/-) liver biopsy, demands a period of intense dietary and Living

lifestyle modifications and re-evaluation to look for improvement.

Conclusion

The opportunity to prolong the life span of cirrhotics with liver transplantation is a potent intervention in our efforts to combat this chronic disease with devastating consequences. It is impossible to over emphasize the importance of early referral, optimal evaluation and therapy of transplant recipients and donors. The therapeutic window for liver transplantation with good results may be lost if the referral is omitted or delayed. Evaluation & optimization of the transplant recipients and donors can cause unforeseen delays in transplantation thereby highlighting the need for early referral of these patients. Every physician following up cases of cirrhotic patients including general practitioners, internists and gastroenterologists in non-transplant centers should keep a close watch for signs of decompensation with regular blood work & surveillance imaging for hepatoma. The first episode of decompensation should prompt referral to a liver transplant physician for pre-transplant evaluation. In those without overt decompensation, a MELD score > 15 may serve as an objective cut off for referral

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Abbreviations

1. MetS - Metabolic Syndrome
2. NASH - Non Alcoholic Steatohepatitis
3. HCC - Hepatocellular Carcinoma
4. RFA - Radio Frequency Ablation
5. TACE - Transarterial Chemo Embolization
6. TARE - Transarterial Radio Embolization
7. MELD - Model for Evaluation of End stage Liver Disease
8. CTP - Child-Turcotte-Pugh
9. USG - Ultrasonogram
10. CT - Computerised Tomogram
11. PPH - Portopulmonary Hypertension
12. HPS - Hepatopulmonary Syndrome
13. SBP - Spontaneous Bacterial Peritonitis
14. AA - Alcoholic Anonymous
15. HBV - Hepatitis B virus



Surgeon Console



Patient Side Cart with EndoWrist Instruments



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Yashoda Cancer Institute leverages on latest technologies and performs advanced and minimally invasive oncology procedures. Our oncologists and specialist doctors leverage on the da Vinci System which has gained popularity for its precision and high-success minimally invasive robotic surgery. The limitations of traditional surgical approaches have been overcome by robotic surgery.

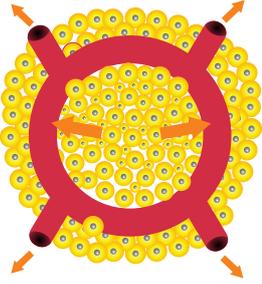
Yashoda Hospitals - Institute of Robotic Sciences presents the da Vinci Surgical System, the dawn of new age in minimally invasive surgery. The da Vinci Surgical System powered by state-of-the-art robotic technology is changing the experience of surgery for people around the world. The system allows our surgeon's commands to be scaled, filtered and translated into precise movements of micro-instruments within the operative site. The da Vinci System enhances surgical capabilities by enabling the performance of even the most complex surgeries through very small incisions with unmatched precision. It promotes improved medical outcomes and greater patient safety.

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Multiple Endocrine Neoplasia Type 1 (MEN1)

Abstract

Type 1 Multiple Endocrine Neoplasia is inherited as an autosomal dominant disorder, leads to hyperplastic/neoplastic changes in parathyroid, pituitary and endocrine pancreas along with other characteristic tumors. Our case was a 51 year old male subject who presented with episodes of gastritis and loose stools. He was diagnosed to be having hypercalcemia secondary to primary hyperparathyroidism. Further evaluation revealed pancreatic neuroendocrine tumors, pituitary microadenoma, thymic carcinoid and solitary metastasis in segment II of the liver. He was subjected to 3½ parathyroidectomy, left hemithyroidectomy and thymectomy. Enucleation of multiple pancreatic lesions and left lateral hepatectomy were also done. A multidisciplinary approach involving surgical oncologists, endocrinologists, and radiologists is pivotal for optimizing patient treatment.

Introduction

Multiple Endocrine Neoplasia Syndrome, Type 1 (MEN1) is a rare under diagnosed autosomal dominant inherited disease [1] with inter and intra familial variability, without a known genotype-phenotype correlation. MEN1 is caused by mutations in the MEN1 gene on chromosome 11, but other genes (CDKN1B, AIP, etc.) and mechanisms might be involved too. It is characterized by the occurrence of varying combinations of Primary Hyperparathyroidism (pHPT), Duodeno-Pancreatic Neuroendocrine Tumors (pNET) and pituitary tumors.

Clinical presentation

A 51 year old male presented to the hospital with the history of recurrent pain abdomen not relieved with proton pump inhibitors, and loose stools. On examination patient was hemodynamically stable. Examination of the abdomen was normal with no other significant clinical findings. Biochemical evaluation of the patient revealed hypercalcemia. On further evaluation patient was diagnosed to be having primary hyperparathyroidism. His biochemical parameters were as follows:

- S. PTH – 416.88 pg/ml (14 – 72)
- TSH – 1.55mU/ml (0.25 – 5.0)
- S. Gastrin – 129 pg/ml (<150)
- S. Insulin – 9.48 microlU/ml (6.0-27)

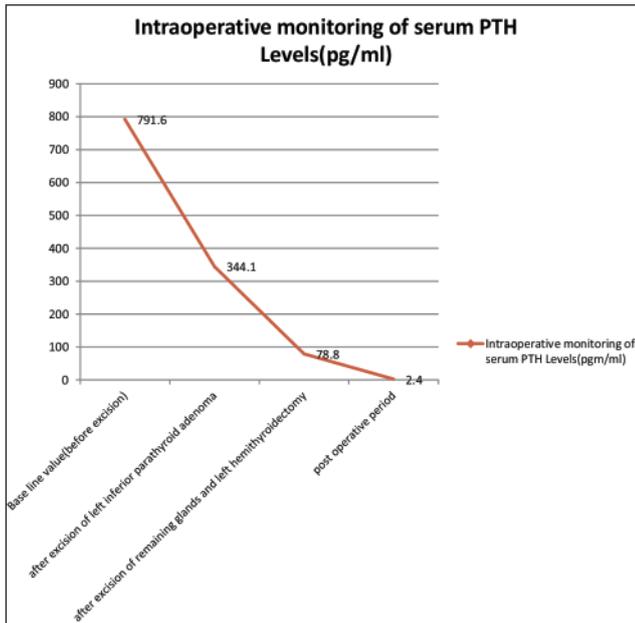
- S AFP-2.15ng/ml
- 24 hours urine metanephrine-191microgms/day
- Serum calcitonin-21.3pgm/ml
- 25 hydroxy vitamin D-> 70ngm/ml
- Serum creatinine-1.7mg/dl
- Serum uric acid-9.8mg/dl
- Chromogranin A-446µgm/ml
- S cortisol-554.87nmol/l
- Serum prolactin-17.72ng/ml
- S.testosterone-3.1ng/ml
- S.LH-0.92mIU/ml
- S.FSH-2.15mIU/ML

Technetium parathyroid scintigraphy showed four gland parathyroid hyperplasia. Gallium dotanoc PET scan showed increased uptake in left adrenal gland, uncinate process of pancreas and hypodense lesion in left lobe of liver. Also well defined non FDG-avid soft tissue density lesions were noticed in paratracheal locations inferior to thyroid gland and in superior mediastinum. CECT abdomen showed multiple renal calculi. MRI brain showed pituitary microadenoma.

Patient was subjected to 3½ parathyroidectomy with reimplantation of 50 mcg of parathyroid in right sternocleidomastoid muscle, left hemithyroidectomy and thymectomy. Intra operative PTH monitoring was done to assess the adequacy of surgery. Enucleation of multiple pancreatic lesions and left lateral hepatectomy were also done. Intraoperative upper gastroduodenoscopy was planned but deferred in view of normal findings in intraoperative ultrasound.

Patient was given Intra venous calcium post operatively. He was subsequently started on oral calcium supplements and discharged. On follow up patient was completely asymptomatic and his serum creatinine normalized.

Intraoperative monitoring of serum parathyroid hormone levels: blood samples were taken from left internal jugular vein.



Serum Calcium levels (mg/dl):

At admission	Post op	On follow up
14.1	8.6	8.4



1) Image shows 4x3 cms right superior parathyroid adenoma



(2) Image shows 1.5x1.5 cms superficial nodular lesion in body of pancreas



(3) Post left lateral hepatectomy



(4) Surgical specimens

Histopathology report:

Specimen	HPE	Mitosis	Mib1 index	Synaptophysin staining	Grade
Right superior parathyroid	Adenomatous hyperplasia				
Right inferior parathyroid	Adenomatous hyperplasia				
Left inferior parathyroid	Adenomatous hyperplasia				
Left thyroid lobectomy	No atypia, mitosis or necrosis				
Thymus	Thymic carcinoid neoplasm				
Gall bladder	Chronic cholecystitis				
Pancreatic lesions					
Uncinate process	neuroendocrine tumor		1.5%	Positive	G1
Body (2 lesions)	neuroendocrine tumor		3.7% and 3.5%	Positive	G2
Left lateral hepatectomy	neuroendocrine tumor		<1%	Positive	G1

Discussion

In 1903, Erdheim published the first case of Multiple Endocrine Neoplasia Type 1 (MEN1) [1,3]. In 1953, Underdahl et al. introduced the term “multiple endocrine adenomas” and reported the first familial occurrence of this syndrome [1,4]. In 1954, Wermer postulated that this syndrome is caused by a mutation in a single gene and inherited in an autosomal dominant fashion [1,5]. MEN1 is a rare heritable disorder with an estimated prevalence of 1–10/100000 [1,2,6,7]. Of the mutation carriers 82–99% has at least one manifestation of the disease at the age of 50 [1,2,8,9,10]. Patients with MEN1 have a shorter life expectancy than the general population [1,11-13] with the most important causes of MEN1-related death being

malignant pNETs and thymic NETs [1,11-14]. The MEN1 gene is a classic tumour suppressor gene which encodes the menin protein [1]. The site of the "MEN1 gene" is region on the long arm of chromosome 11 (11q13) [2].

A consensus statement from an international group of endocrinologists recommended that MEN1 syndrome clinically be defined as the presence of two of the three main MEN1 tumour types (parathyroid, enteropancreatic endocrine, and pituitary tumours). Familial MEN1 was defined as an index MEN1 case with at least one first degree relative who has one of the three main MEN1 related tumours [1,2]. Syndromes clinically related to but genetically distinct from MEN1 do exist, and mutations in the MEN1 gene are not responsible for all individuals [2]. In most cases, primary hyperparathyroidism is the initial manifestation of MEN1, displaying almost 100 percent penetrance by age 40 to 50 years. The biochemical diagnosis of primary hyperparathyroidism is based, as it is in all patients with primary hyperparathyroidism, upon the demonstration of hypercalcemia with inappropriately high serum parathyroid hormone (PTH) concentrations. The most common type of pituitary adenoma in MEN1 is a lactotroph adenoma, but somatotroph, corticotroph, gonadotroph and clinically nonfunctioning adenomas can also occur. Functioning pancreatic islet cell or gastrointestinal endocrine cell tumours become clinically apparent in approximately one-third of patients with MEN1. The most common cause of symptomatic disease is the Zollinger-Ellison (gastrinoma) syndrome. The indications for parathyroidectomy in patients with MEN1 include symptomatic hypercalcemia, nephrolithiasis, and evidence of bone disease, such as diminished bone density or fracture. For patients with MEN1 and indications for parathyroidectomy recommended subtotal (three and one-half gland) parathyroidectomy and reimplantation of 5mg of parathyroid and thymectomy. Symptomatic treatment of the neuroendocrine tumours includes long-acting somatostatin analogues which provide good quality of life and temporary disease stabilization in patients with low-grade tumours [11]. Somatostatin analogue like octreotide is a safe and effective adjunct to surgical strategies for the management of gastro-enteropancreatic neoplasia in hypergastrinemic MEN-1 patients [12]. Surgery should be offered when NETs are resectable and there is curative intent (or when debulking offers palliation) [13]. Surgery if contemplated is a staged procedure but in the current patient all the surgical procedures were performed in single stage. Pituitary adenomas in patients with MEN1 should be treated in the same way as sporadic pituitary adenomas.

Conclusion

With the development of imaging studies the diagnosis of neuroendocrine tumors improved and now it is possible to identify more patients with MEN1 syndrome. Patients suspected of having MEN1 should be evaluated genetically to establish MEN1 diagnosis. MEN1 patients, their relatives and patients suspected of MEN1 are eligible for mutation testing. MEN1 patients and mutation carriers should be subjected to periodic screening in order to detect manifestations in an early stage. Early genetic diagnosis and

subsequent periodic screening is associated with less morbidity and mortality at follow-up.

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Partial Knee Replacement



Dr. Sunil Dachepli
MS, MRCS, CCBST, FRCS, ATLS,
MCh (Ortho), MSc (Tr & Ortho)
Orthopedic Surgeon

“You wouldn't get both the knees replaced, if only one is hurting. Similarly why should we replace all the compartments, if only one area is worn out?”

Introduction:

Isolated Unicompartmental Osteoarthritis of the knee is common. Operative treatment varies from High Tibial Osteotomy, unicompartmental knee replacement to total knee replacement according to the age of the patient and the level of activity.

The goal of knee replacement surgery is to decrease pain and restore function. Although total knee replacement is an excellent option for patients with osteoarthritis of the knee, other surgical options exist. As science is evolving, newer and simpler techniques are available to alleviate pain. Younger patients with osteoarthritis that is limited to just one part of the knee may be candidates for partial knee replacement (also called a Unicompartmental Knee Replacement).

By 2020, total knee arthroplasty utilisation is expected to exceed one million annually (1) and, unlike today, approximately half of these procedures will be performed in patients younger than sixty-five years of age (2).



Anatomy of the Joint & Prosthesis:

Knee joint is divided into three compartments: the medial compartment, the lateral compartment, and the patellofemoral compartment.

Unicompartmental knee replacement is an option for a small percentage of patients (mainly younger age group) with osteoarthritis of a compartment of the knee.

In a unicompartmental knee replacement, only the damaged compartment is replaced. The healthy cartilage and bone in the rest of the knee is left alone.



Total Knee



Partial Knee

Description

Advantages of Partial Knee Replacement

The advantages of partial knee replacement over total knee replacement include:

- Smaller cuts
- Preserving bone & cartilage
- Less pain after surgery
- Less blood loss
- Quicker recovery
- Further revision surgeries are simpler

Because the bone, cartilage, and ligaments in the healthy parts of the knee are preserved, most patients report that a partial knee replacement feels more "natural" than a total knee replacement. A partial knee may also bend better. All joint replacements have a life period. If it becomes loose, it needs to be revised and this is called revision surgery. Revision of a partial knee is simpler compared to total knee replacement. It is also more cost-effective than total knee replacement (3). The Oxford meniscal bearing arthroplasty offers long-term relief from pain with good knee function in the treatment of anteromedial osteoarthritis of the knee with appropriate selection of patients and good surgical technique (4).

Contraindications

Not all patients are suitable for this type of surgery and your specialist will inform you, if you are suitable.

Candidates for Surgery

Retrospective studies indicate that 12.0% to 21.0% of patients who undergo total knee arthroplasty were candidates for unicompartmental knee arthroplasty (5)

We may recommend this surgery if there is advanced osteoarthritis in a single compartment and have exhausted the nonsurgical treatment options. Patients with inflammatory arthritis, significant knee stiffness, or ligament damage may not be ideal candidates. With proper patient selection, modern partial knee replacements have demonstrated excellent medium and long-term results.

Recovery

The partial knee replacement is done through a smaller, less invasive incision, hospitalization is shorter, rehabilitation and return to normal activities is faster.

Patients usually experience less postoperative pain, less swelling, and have easier rehabilitation than patients undergoing total knee replacement. In most cases, patients go home in 2 to 3 days after the operation.

Full weight bearing walking is performed the same day of surgery. You may need a walker, cane, or crutches for initial period, until you become comfortable enough to walk without assistance.

Physiotherapist will give you exercises to help maintain your range of motion and restore your strength.

Both clinical outcome and kinematic studies have indicated that successful unicompartmental knee arthroplasty functions closer to a normal knee. Recent reports have demonstrated success in expanding the classic indications of unicompartmental knee arthroplasty to younger and heavier patients. Both fixed and mobile bearing implants can yield excellent clinical outcomes at >10 years, but with

different modes of long term failure.

For all age groups, lifetime costs were higher for total knee arthroplasty than for unicompartmental knee arthroplasty, and the incremental difference increased with age. Total lifetime QALYs and incremental QALYs gained from total knee arthroplasty compared with those gained from unicompartmental knee arthroplasty decreased with age so that, by the age of sixty-five, unicompartmental knee arthroplasty had gained incrementally more QALYs than total knee arthroplasty.

Results

The results of a study show outstanding functions of the knee joint and satisfactory 10-year survival rate after minimally invasive UKA. Therefore, minimally invasive UKA could be a useful method in the treatment of osteoarthritis in one compartment of knee joint.

We performed 26 Unicompartmental Knee Replacements, so far with a follow up ranging from 6 months to 8 years. So far we had 1 loosening of the implant that had to be converted to a total knee replacement.

Surgeon Training

Last but not the least, very few surgeons are currently trained to perform this procedure hence surgeon choice is vital to prevent complications.

Proper execution of surgical technique remains critical to optimizing outcome (6)

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Dr. M N Pavan Kumar
MS, MCh. (AIIMS), FLT (Seoul)
Surgical Gastroenterologist

Laparoscopy in Small Bowel Obstruction

Indications, Feasibility and Benefits

Intestinal obstruction is a fairly common condition encountered by general and gastrointestinal surgeons, accounting for 15% of the emergency visits for abdominal pain. The causes for intestinal obstruction vary based on the level of obstruction (high/ low small bowel/ colonic), age of presentation and past medical history (previous abdominal surgeries, cardiac ailments). Bowel obstruction can be either small or large bowel obstruction depending on the site of obstruction. Obstruction is considered as complete when patient presents with a sudden onset and rapid progression of symptoms like vomiting, obstipation and abdominal distension. Patients with partial obstruction present with gradual onset and slow progression of constipation followed by distension and vomiting over a period of few days to weeks. The most common causes for small bowel obstruction include adhesions (60% of patients) (Fig.1),

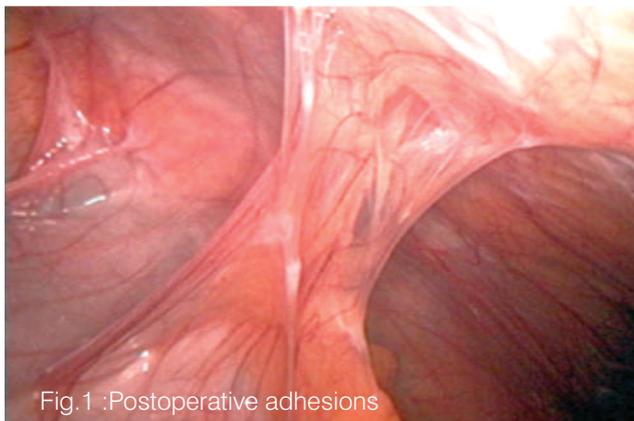


Fig.1 :Postoperative adhesions



Fig.2 : Ileal band division

bands (Fig.2), hernias (external/ internal with malrotation), strictures and tumours (benign & malignant). Abdominal tuberculosis is one of the causes more frequently seen in our country, where the cause of obstruction can be due to adhesions secondary to peritoneal disease or stricture secondary to fibrosis/ inflammatory mass.

Laparoscopy has distinct advantages with regard to diagnosis and treatment of small bowel obstruction. The accuracy and negative predictive value of CT scan with regard to small bowel lesions is still suboptimal even in the era of multislice CT scanners. Laparoscopy enables accurate detection of small peritoneal nodules and adhesions missed on imaging. The role of diagnostic laparoscopy is fairly well established since biopsy can be obtained from suspicious lesions for tissue diagnosis. The present discussion focuses on whether its role can be extended to therapeutic interventions.

Therapeutic laparoscopy has the following advantages in the management of small bowel obstruction

- Absence of scar helps in the reduction of further adhesions following adhesiolysis, thus overcoming the inherent problem of secondary adhesions following open adhesiolysis
- Lesser postoperative pain enables early mobilisation of patient
- Earlier resolution of postoperative ileus due to lesser bowel handling
- Absence of wound related complications especially in the presence of ascites in abdominal tuberculosis

The major problems involved in laparoscopy involve gaining access to peritoneal cavity and bowel handling in view of distended and edematous bowel loops. Presence of adhesions to previous scars presents additional difficulty in the placement of trocars. In view of the above difficulties the conversion rate to open laparotomy ranges from 20-50% in various series. In order to overcome the above problems, careful selection of patients most likely to benefit from laparoscopy and certain surgical principles help in optimising the outcomes. The factors contributing to failure of laparoscopy include dense adhesions, multiple previous laparotomies, bowel ischaemia and grossly distended bowel loops. Hence, it is advisable to advise laparoscopy in the following group of patients

- Early presentation, onset of symptoms less than 24-48 hr

- Not more than two previous laparotomies
- Absence of evidence of bowel strangulation/ perforation
- Maximum small bowel diameter less than 5 cm on imaging.

Therapeutic Laparoscopy has to be considered complimentary to the existing gold standard of laparotomy in the management of patients with bowel obstruction. When chosen properly laparoscopic management of bowel obstruction has been shown to result in early recovery and shorter hospital stay. In our series, 29 patients who presented with small bowel obstruction based on the above criteria were selected for laparoscopy. Majority (13 patients) had short segment obstruction secondary to extrinsic compression from adhesive band (Meckel's/ Ladd's bands). Adhesions secondary to previous laparotomies causing multiple sites of obstruction were found in 12 patients. Internal herniae was encountered in 2 patients while the remaining 2 patients had bowel tumours. Three patients needed open laparotomy due to dense adhesions (Fig 3). One of these patients had adhesions of the bowel to the previously placed mesh. One patient had a ileal adenocarcinoma which needed bowel resection. One patient had a right mesocolic hernia with a

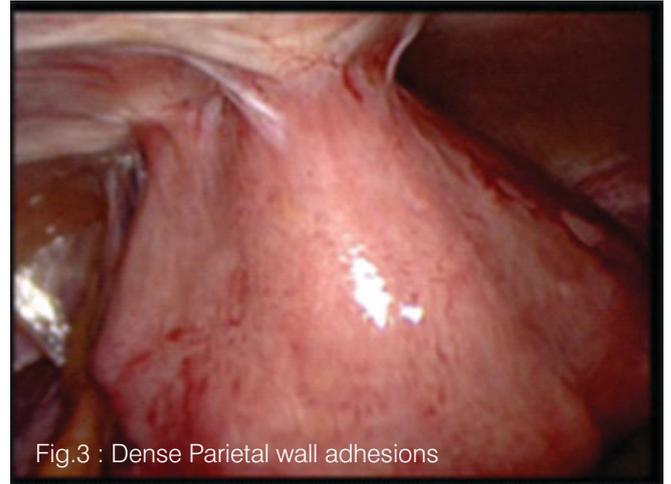
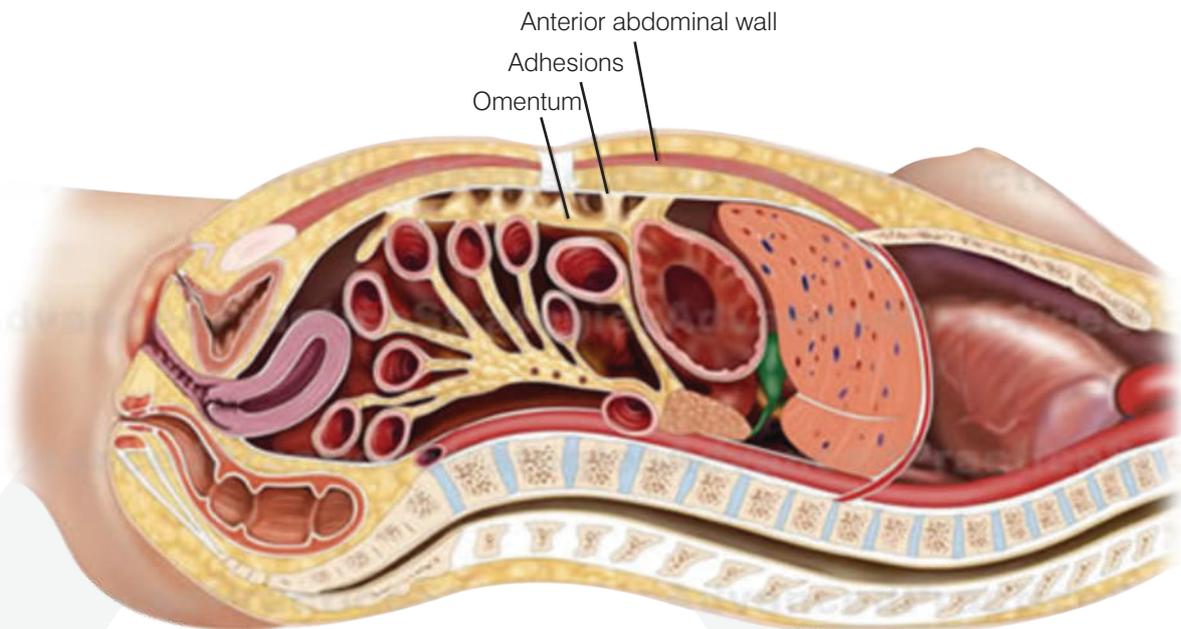


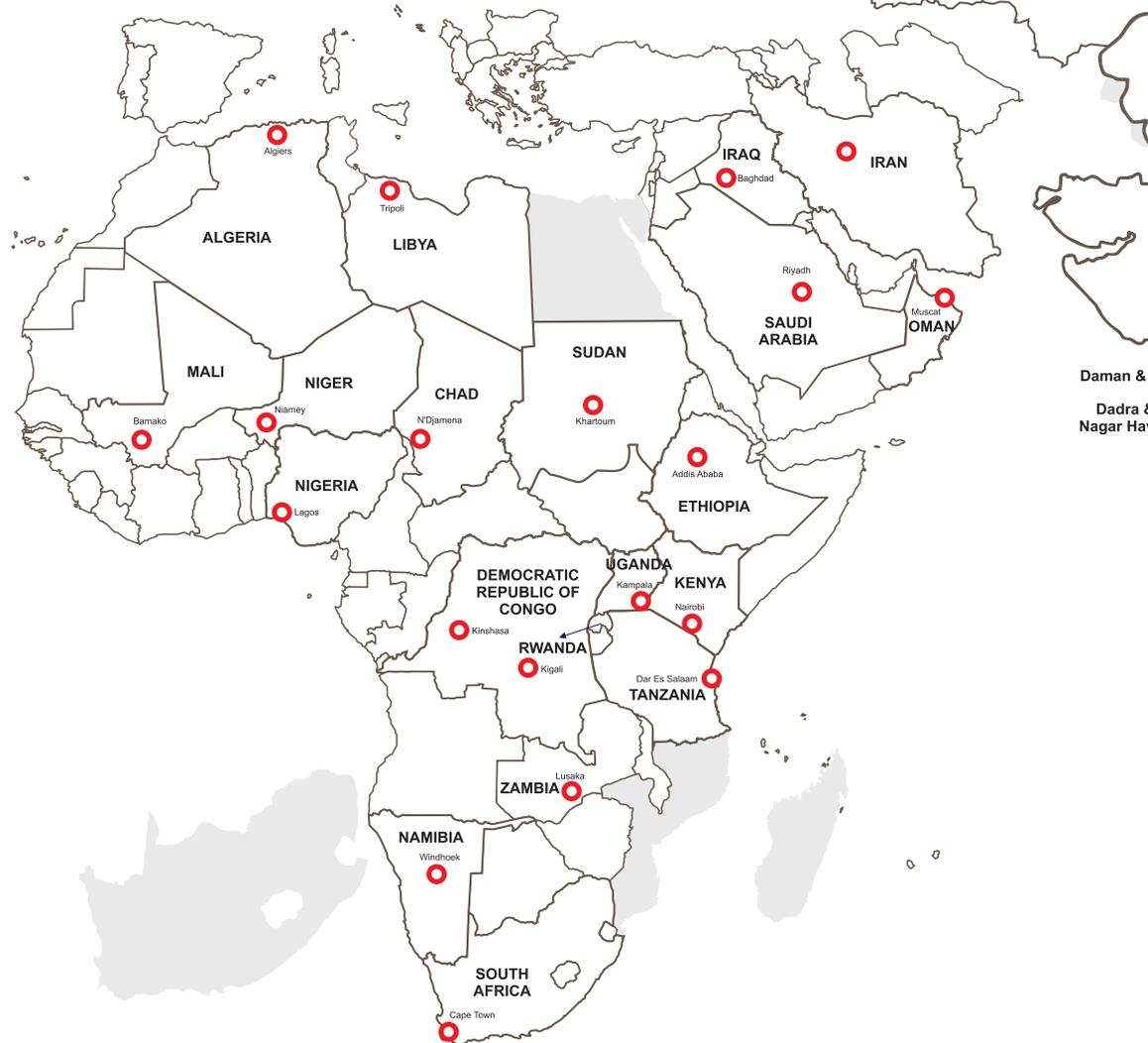
Fig.3 : Dense Parietal wall adhesions

volvulus secondary to Meckel's diverticulum. The average hospital stay of the rest of the patients who underwent therapeutic laparoscopy ranged from 2-4 days.





TREATING PATIENTS FROM ACROSS THE WORLD



Disclaimer: Patients origin countries have been depicted on the map, as per the internal audited reports of Yashoda Hospitals.

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Dr. Urmila Anandh

MBBS (JIPMER), MD (AIIMS), DM, DNB, FRCP (Glasgow), Fellow ISN (UK), ISPD (Toronto) Nephrologist

ABO Incompatible Renal Transplantation

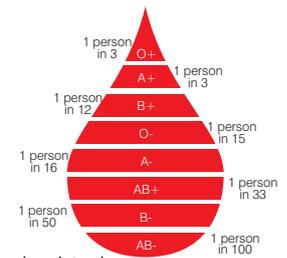
A 22 year old girl was seen in my OPD with a history of weakness, vomiting and swelling of legs. She was investigated and found to have severe renal failure (Creatinine 9.8 mg/dl) and anaemia (Haemoglobin 7 g/dl). Ultrasound showed that her kidneys were shrunken and small in size.

A diagnosis of Chronic Kidney Disease Stage 5 was made and she was started on haemodialysis.

She continued on dialysis for 3 months when one day she and her family expressed a desire for a renal transplantation. She was gainfully employed and dialysis was tying her down to a health facility three times a week. Also she realised that for a young girl, transplantation appears to be the definitive form of treatment for end stage renal disease patients on dialysis.

With that in mind we requested the blood groups of the patient and her prospective live related donors. When the reports came back we realised that she was O positive whereas her parents and her siblings were all non O blood groups. This put us in a dilemma as classical teaching does not allow us to transplant a non O kidney to an O positive recipients.

This is because we are born with an unique blood group which is determined by the type of antigen present on our red blood cells. I am A positive and have antigen A and antibody B in my blood. If I receive a B type blood the b antibodies will mount a tremendous reaction to the B antigen of the blood donated to me. This is also applicable to kidney transplants. My patient who is O positive has both anti A and anti B antibodies. If she receives a kidney from a B group donor her antibodies will react with the donor antigens. She can only receive a kidney from a O group

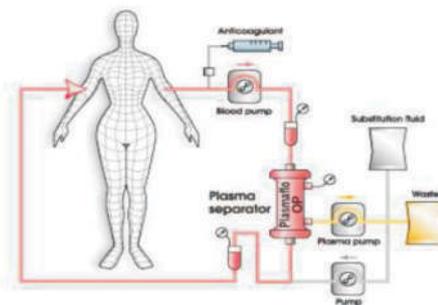


<http://www.bloodbook.com/world-abo.html> donor.(Fig 1)

Figure 1: Blood group antigens

However with the development of newer techniques of removing antibodies from plasma a dehemoglobinised solid organ like kidney can be transplanted to an ABO incompatible recipient.

This is made possible because of various techniques which removes the antibodies before transplantation and also keeps the antibody levels low after the graft has been transplanted. There are various methods by which antibodies can be removed such as plasma exchange, double-filtration plasmapheresis, and antigen-specific immunoadsorption. The main difference among these techniques is their degree of selectivity to achieve this. However, none has been shown to be superior to other. The most common and least expensive method is therapeutic plasma exchange. This procedure eliminates approximately



20% of the anti-ABO antibodies with each session. (Figure 2)

Figure 2: Line Diagram of Plasmapheresis where a plasma filter is connected to the hemodialysis circuit which removes the plasma. A substitution fluid replaces the volume of the plasma back to the patient.

Blood Types				
The ABO Blood System				
Blood Type (genotype)	Type A (AA, AO)	Type B (BB, BO)	Type AB (AB)	Type O (OO)
Red Blood Cell Surface Proteins (phenotype)	A agglutinogens only	B agglutinogens only	A and B agglutinogens	No agglutinogens
Plasma Antibodies (phenotype)	b agglutinin only	a agglutinin only	NONE. No agglutinin	a and b agglutinin

Double filtration plasmapheresis uses a second filter which removes the antibody with a higher efficiency.(Figure 3)

Circuit diagram

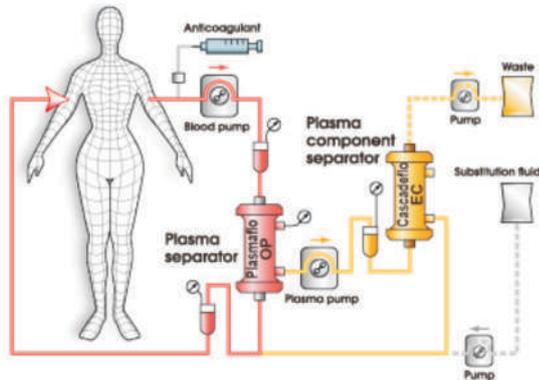


Figure 3 : Circuit diagram of double filtration plasmapheresis where a second filter (Cascadoflo in the picture) further removes the antibodies.

Once the antibodies are removed formation of further antibodies is usually achieved with Rituximab and standard immunosuppression (Steroids, Tacrolimus and Mycophenolate mofetil.)

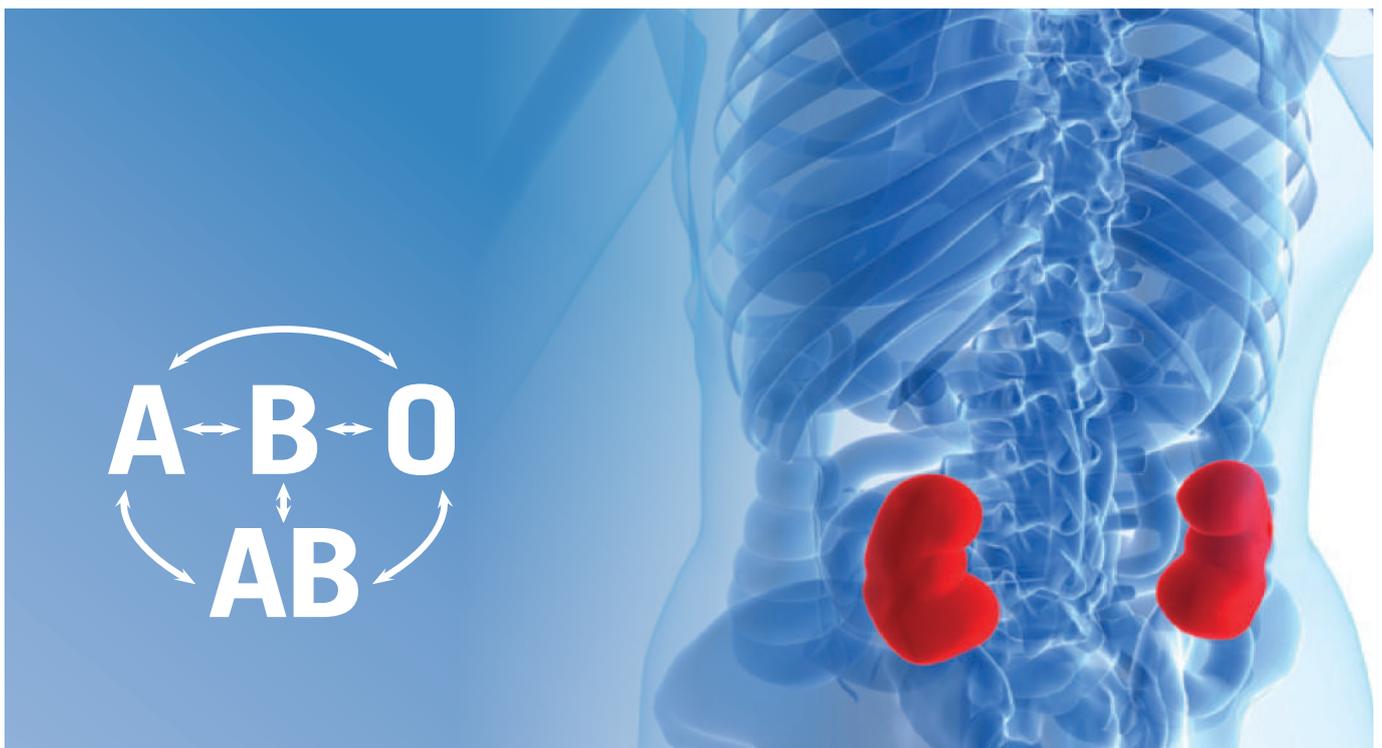
With the availability of newer technologies for removing antibodies and preventing antibody reformation, we discussed renal transplantation across the blood group barrier with our patient. Her mother who was B positive was willing to donate. She was investigated and found clinically fit with no major comorbidities. A flow-cytometry cross-match was negative. The patient’s baseline anti-B antibody

titer was 1:512 which was considered to be high and would have precluded transplantation. She planned for plasmapheresis (one plasma volume) in alternate days followed by intravenous immunoglobulin (IVIg) 100 mg/kg alternating with hemodialysis. This was done to reduce the anti-B antibodies. After 6 sessions of plasmapheresis her antibody titre came down to <1:8. After explaining the procedure of renal transplant and a risk of antibody (anti-B) mediated rejection she was taken up for transplantation. She was planned for induction with two doses of basiliximab (on days 0 and 4 post transplantation) and rituximab (500 mg, one dose) prior to transplantation.

Post-operatively, anti-B titers were monitored daily. She required four sessions of plasmapheresis and intravenous immunoglobulin on post operative days 1, 3, 5, and 8. Initially, her titers rose from 1:8 to 1:128 on post operative day 4 but then spontaneously declined to 1:16 thereafter. Post-operatively, she had a progressive decline in creatinine to 0.9 mg/dl. There was no episode of graft dysfunction/rejection. She was discharged on day 12.

Two years down the line she has normal renal functions and is leading an active life. This gratifying result in ABO incompatible transplantation is in fact replicated by centres all over the world. The 1 year and 5 year survival rates are not significantly inferior of those receiving an ABO compatible renal transplant. The results are definitely far superior to those achieved in patients on dialysis.

With the advent of newer medications ABO incompatible transplantation is slowly becoming a reality. Many centres like ours offer ABO incompatible transplantation as we have the expertise and technology to conduct these procedures.





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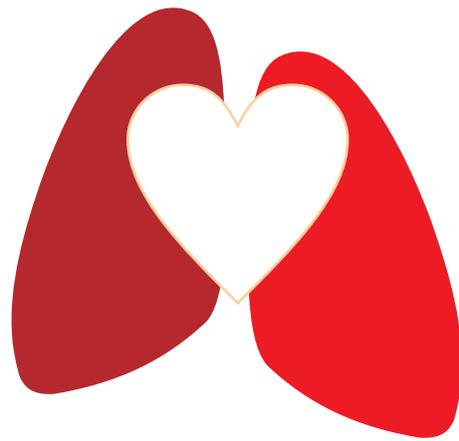
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Diaphragmatic Spindle Cell Sarcoma A Rare Giant Tumour

Primary diaphragmatic tumours are a very rare variant of Mediastinal neoplasm, constitute <1% of all mediastinal malignancies. We report a case of primary diaphragmatic tumour occupying left lower chest and upper abdomen. Histology revealed spindle cell sarcoma and was treated by excision.

A 44 year old female presented with complaints of shortness of breath on mild exertion, dysphagia and headache for 20 days, followed by vague abdominal pain for 7 days. CECT Abdomen and thorax – 18x15x12 cms lobulated heterogeneous thoracoabdominal soft tissue density mass with multiple areas of heterogeneous contrast enhancement extending from posterior mediastinum (subcarinal paraesophageal region) to upper abdomen (renal hilum), compressing left atrium, pushed cardia and pancreas anteriorly. Lower descending thoracic and upper abdominal aorta displaced right side, collapse consolidation of lower lobe of left lung. Upper GI Endoscopy – Extrinsic compression of distal esophagus, proximal stomach. Esophageal candidiasis. CT guided Biopsy: Spindle cell neoplasm.

She underwent left thoraco-laparotomy. A 30x25 cms tumour found to be involving left hemidiaphragm, lower 1/3rd esophagus, proximal stomach and adherent to pericardium, left inferior pulmonary ligament in thorax and spleen, pancreas, left adrenal gland, left kidney and left lobe of liver, IVC, aorta, portal vein and celiac axis (fig.iii). She underwent resection of tumour with left hemidiaphragm and reconstruction of diaphragm with prolene mesh.

Histopathology: Low grade spindle cell sarcoma with focal myxoid sarcoma. Immunohistochemistry: c-kit, SMA, S100P, CD-34 are negative. Mib1 labeling index - <1%.

Primary tumours of diaphragm are very rare. Few are malignant, which are sarcomas of muscular or fibrous in origin, which include fibrosarcoma, leiomyosarcoma, malignant fibrous histiocytoma, germ cell tumours, etc. Patients are often asymptomatic till tumour reaches large size; include chest pain, dyspnea, cough, weight loss, etc. Radiologically diaphragmatic tumours are smooth, lobulated, protruding into inferior portion of lung or resemble diaphragmatic hernia. CT/MRI can confirm the presence of mass arising from diaphragm. When it is large, it is difficult to determine the organ of origin like diaphragm, pleura, lung or abdominal viscera.

Diaphragmatic tumours are rare, mostly benign. Patients are often asymptomatic until tumour becomes large at which point, it is diagnosed by imaging. After they are differentiated from mediastinal tumours, they are treated by surgical

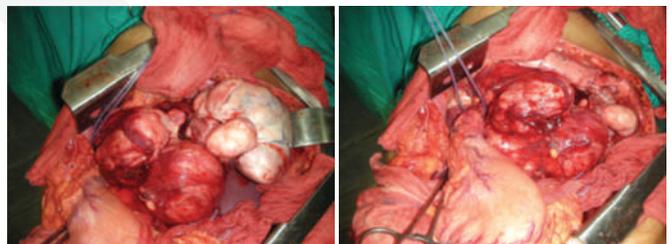


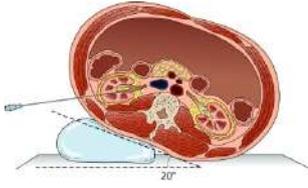
Dr. Sachin Subhash Marda
MS, DNB (Gen. Surgery), Mumbai
Mch, DNB (Surg. Oncology) MRCSEd (UK)
Surgical Oncologist

excision.

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Dr. Naveen Chandra R. Acharya
 M.S, M.Ch (PGI), MRCS (Ed), MNAMS
Dr. Vamsi Krishna, Dr. Priyank Salecha,
Dr. Rohit Muvva
 Dept. of Urology

Percutaneous Nephrolithotomy in the Supine Position: Initial Experience at our Center

Abstract Objectives: To assess the feasibility of performing Percutaneous Nephrolithotomy.

(PCNL) with the patient supine. Although PCNL with the patient prone is the standard technique for treating large (>2 cm) renal stones including staghorn stones, we evaluated the safety and efficacy of supine PCNL for managing large renal stones (up to 2.5cm), with special attention to evaluating the complications.

Patients and method: In a prospective study between March 2016 and June 2016, 20 patients with large renal stones underwent cystoscopy with a ureteric catheter inserted, followed by puncture of the collecting system while they were supine. Tract dilatation to 24 F was followed by nephroscopy, stone disintegration using pneumatic lithotripsy, and retrieval using a stone forceps. All patients had a nephrostomy tube placed at the end of the procedure.

Results: The median (range) operative duration was 120 (90–210) min, and the mean (SD) volume of irrigant was 18.2 (3.7) L. One puncture/two punctures were used to enter the collecting system and clearance was considered with fragments <5mm. We achieved total clearance in 20 out of 20 patients (100%).

Conclusion: Supine PCNL is technically feasible; it has several advantages to patients, urologists and anaesthesiologists. It gives stone-free rates and a low incidence of organ injury comparable to those in standard prone PCNL.

Introduction: In 1976 Ferstrom and Johansson [2] reported the first percutaneous procedure for stone removal and since then percutaneous nephrolithotomy (PCNL) has been shown to be effective and safe for treating large renal stones (>2 cm), including staghorn stones. PCNL is usually done with the patient prone, as it is believed that for puncturing and dilatation of the kidney, which is a retroperitoneal organ, the posterior approach provides a large working space with a lower incidence of splanchnic and vascular injury. However, even in this position, major complications, including haemorrhage and organ injury, have been reported in

0.9–4.7% of cases [3, 4]. The prone position is associated with patient discomfort, a compromised circulation and ventilation, especially in obese patients, and it is also time-consuming and increases the radiological hazards to the urologist [4].

Various modifications of patient positioning for PCNL were tried as urologists understood more of the surface anatomy of the kidney and related viscera. These included the reverse lithotomy [5], supine [6] and lateral decubitus [7] positions. These options were shown to be safe and effective compared with the conventional prone PCNL, yet were never popular. The complete supine PCNL is a tempting substitute for prone PCNL, with the potential advantages of less patient handling, a quicker operation, better drainage through the Amplatz sheath, and the ability to perform simultaneous PCNL and ureteroscopic procedures [6–8]. Although severe complications of anaesthesia are infrequently reported with the patient prone, the supine position is more comfortable for the anaesthetist, especially in obese patients at high risk during anaesthesia [6]. Thus we assessed supine PCNL to evaluate its safety and efficacy in managing large renal stones, with special attention to evaluating the complications.

Patients and method
 At our Centre, between March 2016 and June 2016, supine PCNL was used in 20 patients (median age 39 years, range 19–62; 11 men and 9 women) with a median (range) body mass index (BMI) of 30 (17–42) kg/m². The preoperative evaluation included history, clinical examination and routine laboratory investigations. All patients had IVU or non-contrast enhanced spiral CT of the urinary tract to evaluate the stone location, burden and radiolucency. The stone burden was determined by measuring the longest diameter on the preoperative radiological investigations; if there were multiple calculi, the burden was defined as the sum of the longest diameter of each stone. A preoperative sterile urine culture was mandatory and patients with a positive culture were treated for 48 hours before PCNL, and the treatment continued for 7 days afterwards. A third-generation cephalosporin was given as prophylaxis to patients with a sterile culture at the time of surgery, and was continued for 48 hours afterwards. Stones included in the study were either single stone within the renal pelvis or within lower calyx/

middle calyx with or without extension in pelvis. The average stone size was <25 mm, 10 patients had a pelvic stone, and 3 had lower calyx stone and 7 patients had stones within middle/lower calyx with extension to renal pelvis. The procedure began with the patient in the lithotomy position, with insertion of an open-tip 5 F ureteric catheter, using a 20 F cystoscope. The operative duration was calculated from the time of ureteric catheter insertion until the nephrostomy tube was secured to the skin. After inserting the ureteric catheter, the patient was placed supine with the ipsilateral arm secured to the chest, and a 1-L fluid bag under the flank. Under fluoroscopic guidance an 18 G needle was used to puncture the collecting system. Unlike in the prone position, the needle must remain almost horizontal or slightly inclined upward towards the operating table. We marked the puncture site, which lies at the level of around 2cm above the tip of 12th rib anteriorly. We used USG before puncturing to confirm that we are in right plane and no surrounding structures are damaged while tract dilatation.



Fig 1: Patient in supine position while puncture:



Fig 2: Puncture site:

A 0.9 mm (0.038 inch) guidewire was inserted, followed by dilatation of the tract using PTFE dilators up to 22F; using metallic telescopic dilators (Alkan's dilators), followed by the insertion of a 24 F Amplatz sheath. The increased mobility of the kidney, due to the absence of support when supine, caused the guidewire to buckle, hindering tract dilatation. This was managed by an assistant supporting the patient's abdomen, pushing it backward during dilatation. After tract

dilatation we used a 20 F nephroscope with a ballistic energy source for stone disintegration. The volume of irrigant used and the duration of fluoroscopic exposure were recorded at



the end of the procedure.

Haemodynamic changes and any need for transfusion were evaluated and recorded during the first 24 hours after surgery. A radiological examination was used to assess stone clearance on the first day after surgery, with either a plain film of the abdomen with USG abdomen or CT of the urinary tract.

Results

The median operative duration was 120 mins, and the median duration of X-ray exposure was 10 mins. The mean (SD) volume of irrigant fluid was 18.2 (3.7) L. One puncture was used to enter the collecting system in 18 renal units (90%), while two renal units (20%) with a staghorn stone needed two punctures. We used a stone size of <5 mm as the protocol for there being no need for further treatment. Of the 20 renal units treated, 18 had no and 2 patients had <5 mm residual fragments, resulting in a stone-free (success) rate of 100%. All patients were stone-free at a 3-month follow-up. Any reduction in haemoglobin level and the vital signs, were recorded. No patient within the study needed blood transfusion. On the 1st postoperative day nephrostomy was removed and DJ stent was removed after 3 week duration.

Discussion

PCNL is widely accepted as the treatment of choice for large renal stones, including Staghorn stones. It is less invasive, effective, safer and has a lower complication rate than open renal surgery [10]. PCNL is usually done with the patient prone, which carries several disadvantages to the patient, anaesthesiologist and urologist.

In 1987, Valdivia et al. [11] reported the first study on the feasibility of PCNL in the supine patient, but it was 1998 before the same authors reported their 10-year experience of PCNL with the patient supine [6], and that this technique was then reintroduced. The results were similarly good in several other reports [12–14], confirming the efficacy and safety of supine PCNL for treating most renal stones. The supine position offers several advantages. General anaesthesia is less hazardous, no repositioning of the patient is needed, it is more comfortable for the surgeon, who can work while seated. The X-ray exposure to the surgeon during the entire

procedure is decreased because the surgeon's hands are no longer in the fluoroscopic field and stone fragments are cleared easily.

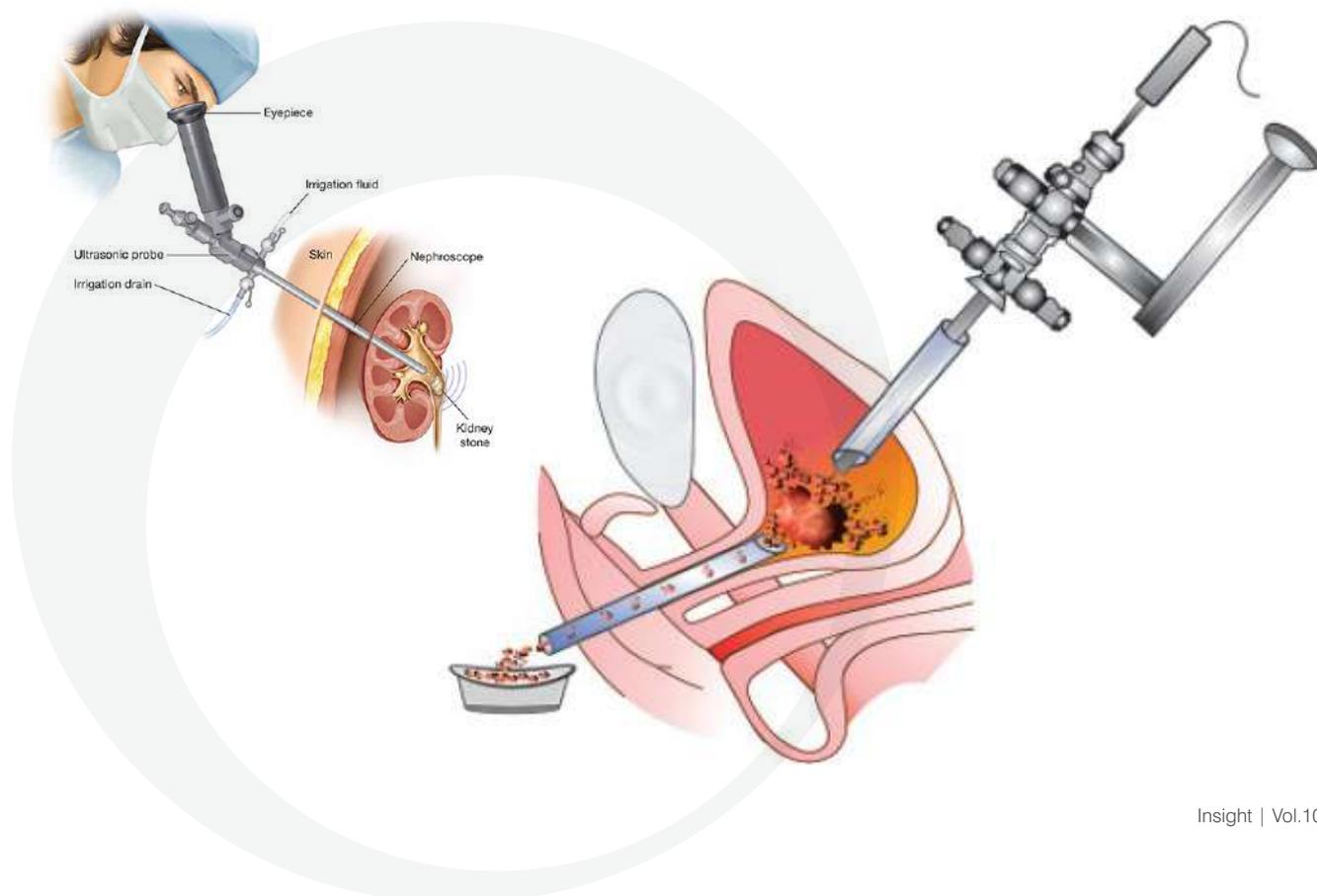
PCNL with the patient supine has some limitations. It decreases the filling of the collecting system, making it constantly collapsed, and thus nephroscopy tends to be more difficult. However, maintaining low pressures within the renal cavities might be important to decrease fluid absorption. Upper-pole calyceal puncture is very difficult because the upper pole lies more medial and posterior, and is concealed deeply in the rib cage. Also, renal puncture in the supine position requires that the needle-pass lies horizontally, which in an upper calyceal puncture will strike into the calyceal neck, and not the infundibulum. There was anteromedial renal displacement during tract dilatation, rendering the procedure more difficult, and this was managed by supporting the kidney while creating the tract.

The present study has several limitations; it included a relatively small sample, and although it included patients with staghorn stones, the stone burden was relatively low. This was a descriptive study lacking a comparative arm and was not randomised.

In conclusion, supine PCNL is technically feasible, has several potential advantages, especially in patients at high risk when under anaesthesia, and can be used to treat stone of appreciable size. There is no apparent added risk in using this technique, and the stone clearance and complication rates are within the accepted values cited previously for the standard prone PCNL.

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Dr. Revathy Ramaswamy
MD, DGO (KEM) Mumbai
Gynaecologist and Endoscopic Surgeon

Hysteroscopy

A Necessity In Modern Gynaecology

Hysteroscopy is a minimally invasive intervention that can be used to diagnose and treat many intrauterine and endocervical problems. It is one of the least invasive procedures, which can also be done in office setting.

It permits visualisation of the endometrium and endocervix using a trans cervical approach, with endoscopes, light source and camera system. Since the uterus is collapsed within a tough muscular layer, liquid, sometimes gaseous media under pressure is used to distend the cavity. Operating channels are available for operative procedures, akin to urological resectoscopes.

The operative systems could be electrical or mechanical. The energy used could be monopolar, bipolar electrical energy, heat energy, radiofrequency source or laser.

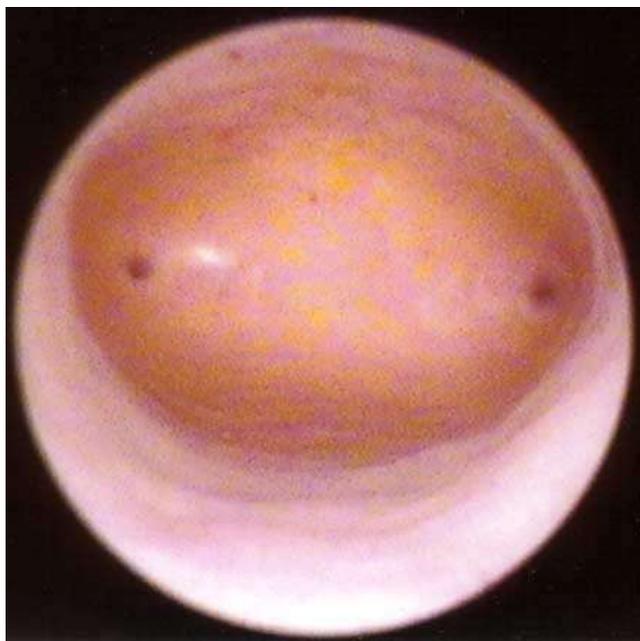


Fig : Normal uterine cavity on Hysteroscopy

Mrs. A, 64 years old, an obese, hypertensive woman, well into her menopause, presented with vaginal bleeding in our OPD. Her systemic and gynaec examination were normal. Ultrasound showed a thickened endometrium of 16mm, with all other normal parameters. Pap smears were normal too.

She was subjected to a hysteroscopic evaluation which revealed a large polyp arising from the fundus of the uterus. The endometrium was atrophic. The polyp was removed with a

scissor nick on the base and extracted out. She was streetfit the same day.

If we analyse the above scenario sans hysteroscopy, the management would be different. Foremost, there would be a fear of cancer in both the patient and the doctor. A D and C would have been done, with no specimen being obtained due to the atrophic endometrium and hysterectomy would be a certainty.

Hysteroscopy has enabled a very conservative procedure for an elderly lady already compromised with age.

To further analyse, if she did have a malignant or premalignant lesion in the endometrium, adequate biopsy material would have been obtained and an appropriate surgery like a radical hysterectomy could be further planned.

Hysteroscopy is the mainstay for abnormal postmenopausal bleeding.



Fig : Posterior wall endometrial polyp

Likewise, hysteroscopy has brought in significant changes in management protocols in gynaecology.

Hysteroscopic polypectomy, myomectomy, and endometrial ablation are just a few of the commonly performed procedures. Given their safety and efficacy, diagnostic and operative hysteroscopy have become standards in gynecologic practice.

The development of hysteroscopy is rooted in the work of Pantaleoni, who first reported uterine endoscopy in 1869. Hysteroscopy did not become popular until the 1970s, when

more practical and usable instruments, liquid distention media, better optics and light sources came to vogue and many new hysteroscopic procedures, including endometrial ablation, were developed.

Initially used by urologists for transurethral resection of the prostate, the resectoscope was modified for hysteroscopic procedures, allowing for resection of intrauterine pathology with monopolar cautery. By the mid-1980s, hysteroscopic procedures had nearly replaced dilation and curettage (D&C) for diagnosing intrauterine pathology.[9]

Over the past few decades, refinements in optic and fiberoptic technology and inventions of new surgical accessories have dramatically improved visual resolution and surgical techniques in hysteroscopy. Many hysteroscopic procedures have replaced old, invasive techniques. Now, as instruments become smaller than before, office hysteroscopy is replacing operating-room procedures. One of the most recent hysteroscopic procedures approved by the US Food and Drug Administration (FDA) is female sterilization (Essure, Conceptus, Incorporated, Mountain View, Calif), which can be performed in the gynaecologist's office. Novel instruments and techniques continue to emerge, and the prospects for improvement seem unlimited.

Hysteroscopy has nearly replaced standard D&C for the management of abnormal uterine bleeding (AUB), as it allows for direct visualization and diagnosis of intrauterine abnormalities, and it often offers an opportunity for simultaneous treatment.



Fig : Hysteroscopic myomectomy

Hysteroscopy is a part of the routine workup for infertility, especially useful to correct intrauterine septums, submucous fibroids, osseous metaplasia, cornual blocks, tubal blocks, endometrial polyps and adhesiolysis.

It is our main tool to extract missing IUCDs and Retained Products of conception, when repeated attempts of curettage traumatizes the endometrium without getting a grip on the device or completely evacuating the products.

Hysteroscopic myomectomy and septal resection are the best treatment options in submucous fibroids, or intrauterine septae in women with recurrent abortions.

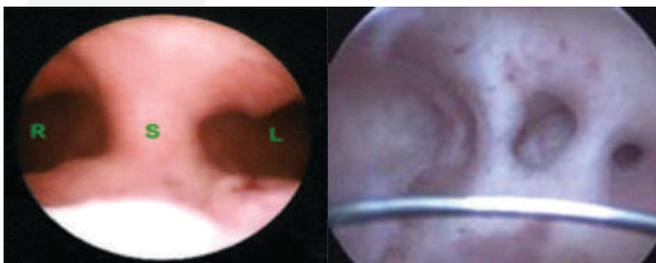


Fig: Intrauterine septum

Fig: Asherman syndrome

Irreversible tubal sterilization can be accomplished transcervically with the Essure Contraceptive Tubal Occlusion Device and Delivery System (Conceptus Inc, Mountain View, Calif). This procedure hasn't yet been taken up widely due to cost constraints.

Contraindications

In general, hysteroscopy is avoided in patients with the following findings:

- Active cervical or uterine infection
- A large uterine cavity, i.e, longer than 10 cm in length (clinically similar to a 12-wk pregnant uterus)
- Severe medical conditions precluding surgery

Postoperative care

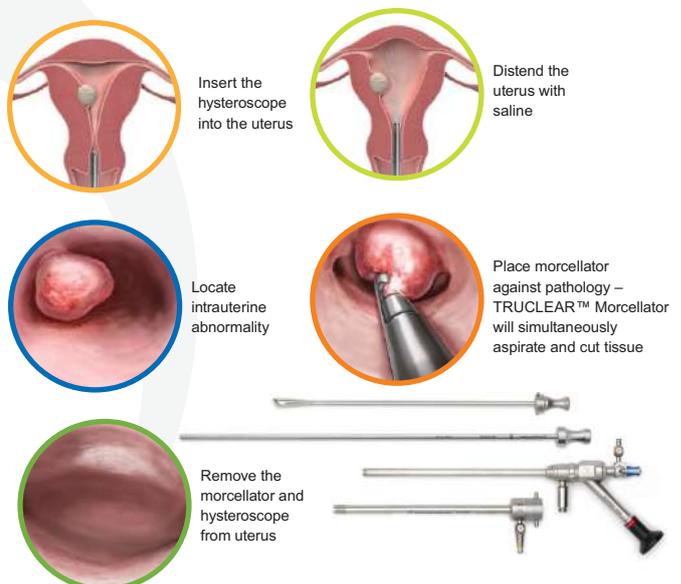
Simple antispasmodics are sufficient to relieve post-op cramping. NSAIDs are advised for 48 hours post op. We routinely give antibiotic prophylaxis for 3 days.

Prevention of postoperative adhesion is an essential aspect of hysteroscopic surgery. Minimizing endometrial and myometrial trauma during the initial hysteroscopic procedure. A paediatric foley for 5 days, with estrogen supplementation for one month is sometimes used where intrauterine adhesions are suspected.

Hysterectomy is the commonest gynaecological surgery performed the world over. Pathology reveals that in almost 20% of the women - the procedure may not have been required. Researchers found that 37.7% of women had no documentation indicating they underwent alternative treatment prior to undergoing a hysterectomy. Less than 30% of women received medical therapy or alternative therapies prior to a hysterectomy.

Although quality in gynaecologic surgery has focused on care after a procedure, these findings suggest that appropriateness of surgery could serve as an important quality metric in gynaecology.

Reducing the number of procedures performed in women who may not necessarily require the procedure in the first place has the potential to have an even more meaningful impact in reducing adverse outcomes and cost than optimization of postoperative care. Endoscopic procedure like hysteroscopy, colposcopy, laparoscopy aid in localisation of pathology and conservative approach to management.



Small-for-gestational-age versus appropriate-for-gestational-age:

Comparison of cord blood lipid profile & insulin levels in term newborns (SAGA-ACT study)

Limmy Loret Lobo¹, H. Uday Kumar¹, Tejeswita Mishra¹, Tripura Sundari², Archana Singh², C. Vijai Kumar², G. Kondal Rao¹, B. Jahangir¹, Vijay Misale¹, Poonam Prashant², Nirlep L. Gajiwala⁴ & Ashok S. Thakkar³

¹Department of Cardiology, Yashoda Hospital, ²Department of Obstetrics, Gandhi Medical College & Hospital, ³Secunderabad Diagnostic & Research Centre, Secunderabad & ⁴Department of Clinical Trials, Sahajanand Medical Technologies Pvt. Ltd., Surat, India

Atherosclerotic cardiovascular diseases, comprising coronary heart disease and cerebrovascular diseases, are the single largest cause of morbidity and mortality worldwide. The estimated prevalence of cardiovascular diseases ranges from 6-10 per cent among the Indian population. Further, cardiovascular diseases account for about 52 per cent of deaths among Indian individuals <70 yr of age¹. Although sedentary lifestyle, fat-rich diet, obesity, smoking, alcohol, etc., are considered as the major predisposing factors of atherosclerotic cardiovascular diseases in adults, it has been identified that the genesis of atherosclerotic lesions starts much early in life². Barker in 1995³ had proposed a “foetal origin of cardiovascular disease” hypothesis, according to which the origin of the disease lies in utero where adaptations take place in the foetus who are undernourished during middle-to-late gestation. These adaptations can be seen in the form of cardiovascular, biochemical or endocrinological changes related to cholesterol metabolism, insulin responses to glucose and structural and functional alternations in the internal organs, leading to inappropriate foetus growth. The series of these events during the early phase of life may trigger the development of atherosclerotic heart diseases during adulthood³. The awareness and worldwide acknowledgment of this hypothesis highlighted the importance of lipid profile estimation in the paediatric age group. If the premature development of the disease can be anticipated during childhood, the cardiovascular events can be prevented effectively by taking appropriate measures.

It has been widely reported that hypercholesterolaemia, a significant risk factor of cardiovascular disease, can be diagnosed at the time of birth by an elevated level of cholesterol in umbilical cord blood^{2,4,5}. Further, the estimation of cord blood lipid profile is feasible because of the ease with which cord blood can be collected at birth and availability of a simple method for detection of lipid and insulin levels from the samples². The present study was conducted to estimate the significance of in utero malnutrition in the development of cardiovascular disease by comparing cord blood lipid profiles and serum insulin levels between small-for-gestational-age (SGA) and appropriate-for-gestational-age (AGA) term newborns.

Material & Methods

The Small-for-gestational-age versus Appropriate for Gestational Age: Analytical comparison of Cord blood lipid profiles and insulin levels in Term newborns (SAGA-ACT) study was a cross-sectional analysis to compare the cord blood lipid profiles and insulin levels between the SGA and AGA full-term newborns. The study was conducted at the



Dr. Uday Kumar. H
MBBS, MD, DM
Cardiologist

Obstetric Unit of Gandhi Medical College and Hospital, Secunderabad, India, for two months from June 20, 2013. Enrolment was done when the woman included in the study reported to the antenatal ward in labour. Gestational age was calculated based on the last menstrual period and initial ultrasonography reports. The term SGA was used to categorize newborns whose weights were below the 10th percentile for their gestational age. The term AGA was used to categorize newborns whose birth weight was between the 10th and 90th percentile for gestational age. Birth weight percentile was calculated based on the growth curve derived by Alexander *et al*⁶ and Oken *et al*⁷.

The key inclusion criteria were: full-term pregnancy (37-42 wk) and APGAR (Appearance, Pulse, Grimace, Activity, Respiration) score^{8,9} of >6 at one min and 8-10 at five min of birth. The newborns were excluded if the labour was prolonged or medically induced, required resuscitation, the mothers had older gravida or complications such as gestational diabetes, cardiac disease, obesity, hypercholesterolaemia or dyslipidaemia during pregnancy, newborns with birth weight >4 kg or newborns with any major congenital anomaly. All consecutive newborns from mothers who qualified the inclusion criteria and agreed to participate in the study were enrolled to avoid the potential selection bias. Accordingly, a total of 103 newborns, 51 SGA and 52 AGA newborns, were enrolled in the study. The proposal was approved by the Institutional Ethics Committee. Informed written consent was obtained from all participating mothers at the time of enrolment.

Data collection: Cord blood lipid profiles and insulin levels were estimated in each newborn enrolled in the study. Cord blood sample (5 ml) was collected in sterile tubes from the placental side of the umbilical cord within 10 minutes of birth. The samples were allowed to clot for 10 minutes were stored at 4-8°C and were transported to the central laboratory for biochemical analysis. Total cholesterol levels, the primary end-point of the study, were determined by the cholesterol oxidase/phenol + aminophenazone end-point enzymatic method. High-density lipoprotein (HDL) cholesterol levels were determined by detergent/bichromatic end-point method while triglyceride levels were determined by lipase/glycerokinase bichromatic end-point method. All kits were purchased from Siemens Healthcare Global, Germany. Low-Density Lipoprotein (LDL) cholesterol and Very Low-Density Lipoprotein (VLDL) levels were estimated according to the Friedewald's formula¹⁰. Total cholesterol/HDL cholesterol ratio was also calculated for each newborn.

Apart from lipid profile, insulin levels were estimated from cord blood samples using chemiluminescence immunoassay (Siemens Healthcare Global, Germany). The presence and severity of maternal anaemia were estimated based on haemoglobin (Hb) cut-off criteria: Hb levels <7 g per cent being severe anaemia, 7-9.9 g per cent being moderate anaemia and 10-10.9 g per cent mild anaemia.

Statistical analysis: Z-test was used to determine the statistical difference between the groups. To prove that lipid levels were higher in the SGA newborns than those in the AGA newborns, one-sided (i.e., upper-tailed) statistical test was used. Spearman's rho correlation coefficient was computed to assess the relationship between maternal age and total cholesterol levels of neonates. Further, the SGA and AGA neonates were evaluated for their association with pregnancy-induced hypertension in mothers using the Chi-square test. Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software, version 15 (SPSS Inc., Chicago, IL, USA).

Results

The baseline characteristics of newborns enrolled in the study are described in Table I. The gender distribution was similar in both study groups with males constituting 57.7 per cent of neonates in the AGA group and 56.9 per cent of neonates in the SGA group. The mean gestational age was 38.42 ± 1.29 wk in the AGA group and 37.55 ± 1.04 in the SGA group. There was a significant difference between the AGA group and the SGA group in terms of mean birth weight of newborns (2.80 ± 0.26 vs. 2.05 ± 0.26 kg, $P < 0.01$); majority of these neonates were delivered vaginally, and the caesarean sections were reported in <10 per cent cases in both groups.

Cord blood lipid profile and insulin levels: Mean cholesterol levels, triglyceride levels, LDL cholesterol levels and VLDL levels were significantly higher in the SGA group than that in the AGA group ($P < 0.01$). The distribution of newborns according to their total cholesterol levels is depicted in Fig. 1. Twenty three newborns in the SGA group had total cholesterol level more than 60 mg/dl as compared to 13 in the AGA group. The total cholesterol/HDL cholesterol ratio was also significantly higher ($P < 0.01$) in SGA group compared to AGA group. HDL cholesterol and insulin levels were comparable between the AGA and SGA groups (Table II).

Presence of maternal anaemia: Data on maternal haemoglobin levels were available for 40 mothers in the AGA group and 39 mothers in the SGA group (Fig. 2). Accordingly, the mean maternal haemoglobin level was 10.5 ± 1.17 g per cent (range: 8-13 g%) in the AGA group and 10.26 ± 1.71 g per cent (range: 5.5-14 g%) in the SGA group. In the AGA group, 18 (45%) mothers had mild anaemia and 10 (25%) had moderate anaemia. Severe anaemia was not reported among mothers in the AGA group. On the contrary, two (5.1%) mothers in the SGA group had severe anaemia. Further, mild and moderate anaemia were found in 11 (28.2%) and 14 (35.9%) mothers in the SGA group, respectively. Twelve mothers each from both study groups (30.8% of mothers in the SGA group and 30 per cent of mothers in the AGA group) reported haemoglobin levels ≥ 11 g per cent.

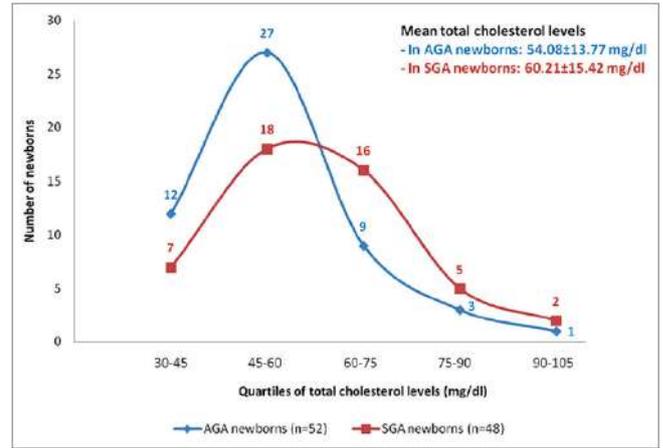


Fig. 1. Frequency distribution of maternal anaemia. AGA, appropriate-for-gestational-age; Hb, haemoglobin; SGA, small-for-gestational-age; Haemoglobin levels (in g%): severe anaemia, <7; moderate anaemia, 7–9.9; mild anaemia, 10-10.9; no anaemia, >11.

Effect of other factors: The maternal age was comparable between the two groups (22.58 ± 2.34 vs. 24.04 ± 3.35). A weak positive correlation was observed between maternal age and total cholesterol levels of all neonates (correlation coefficient $r = 0.16$, $P = 0.11$). In particular, the correlation coefficient for maternal age versus cholesterol levels of neonates in the SGA group was 0.21 ($P = 0.16$), while that of neonates in the AGA group was 0.04 ($P = 0.78$). The association between the presence of pregnancy induced hypertension and SGA/AGA outcome in newborns was not significant.

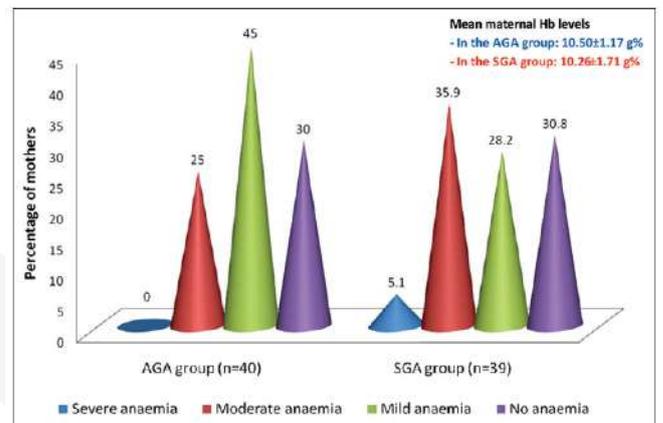


Fig. 2. Total cholesterol levels in newborns. Forty eight SGA newborns were included in the analysis after excluding three outliers for total cholesterol levels. AGA, appropriate-for-gestational-age; SGA, small-for-gestational-age

Discussion:

Studies have affirmed that low birth weight and intrauterine growth restriction are linked to atherogenic and insulinogenic risk factors, particularly in SGA neonates^{11,12}. A study of 1502 pregnancies by Mattioli et al¹³ reported a 16 per cent occurrence of neonates being SGA. Considering the high prevalence and a high risk of cardiovascular events in SGA newborns, the present study was aimed to identify the cardiovascular risk factors in the earliest stage.

Table I. Demographic characteristics of study population

Demographic characteristic	AGA group (n=52)	SGA group (n=51)
Gender, n (%)		
Male	30 (57.7)	29 (56.9)
Female	22 (42.3)	22 (43.1)
Mean gestational age (wk; mean±SD)	38.42±1.29	37.55±1.04
Mean birth weight (kg; mean±SD)	2.80±0.26**	2.05±0.26

**P<0.01 compared to SGA group. AGA, appropriate-for-gestational-age; SD, standard deviation; SGA, small-for-gestational-age

Table II. Cord blood lipid profile and insulin levels in appropriate-for-gestational-age (AGA) versus small-for-gestational-age (SGA) term newborns

Parameter	AGA group (n=52)	SGA group (n=51)
Total cholesterol levels (mg/dl) [†]	54.08 ± 13.77	60.21 ± 15.42
Triglyceride levels (mg/dl)	32.67 ± 17.74	42.89 ± 24.90
HDL cholesterol levels (mg/dl)	19.92 ± 7.46	20.00 ± 8.91
LDL cholesterol levels (mg/dl)	27.56 ± 8.94	33.71 ± 14.71
VLDL cholesterol levels (mg/dl)	6.60 ± 3.60	9.10 ± 6.64
Total cholesterol/HDL cholesterol	2.81 ± 0.62	3.38 ± 1.10
Insulin levels (mg/dl)	3.49 ± 2.11	3.72 ± 2.70

Data are expressed as mean±SD[†]. Forty eight SGA newborns were included in the analysis after excluding three outliers for total cholesterol levels. HDL, high-density lipoprotein; LDL, low-density lipoprotein; VLDL, very low-density lipoprotein; *P<0.01 compared to AGA group

The cord blood lipid profile of newborns investigated in the present study was in line with the findings of other studies done in India or other parts of the world^{14,15}. Comparison of study groups revealed that the total cholesterol, triglyceride and triglyceride and LDL cholesterol levels were significantly higher in the SGA group of newborns as compared to the AGA group of newborns. However, the insulin levels were comparable between the two groups. This indicates that inappropriate foetus growth has a significant role in altering lipid metabolism. Further, it can be anticipated that the SGA newborns are at high risk of cardiovascular disease during their adulthood.

There have been discrepancies in reporting the cord blood lipid levels in SGA newborns. Kumar et al have reported no association between the cord blood cholesterol levels and birth weight of newborns but demonstrated elevated cord blood triglyceride levels in newborns with growth retardation. Singh et al² have reported a significant correlation between the cord blood lipid profile and the birth weight of neonate. On the contrary, Elizabeth et al¹⁶ reported that neonates with low birth weight had lower levels of cholesterol and triglycerides as compared to controls. Nayak et al reported that the triglyceride levels were significantly higher in the SGA newborns as compared to the AGA newborns. Restricted intrauterine growth might be the possible explanation for elevated lipid profile in SGA newborns in the present study. Maternal anaemia could have played a role in the intrauterine growth of these neonates.

Anaemia during pregnancy is a significant health concern worldwide. The health of the mother as well as the foetus is largely influenced by anaemia. A significant association has been reported between maternal anaemia and risk of preterm deliveries, low birth weights, morbidity and perinatal

mortality¹⁷. A meta-analysis of 12 studies has reported that moderate-to-severe maternal anaemia is associated with >50 per cent increase in the risk of newborn being SGA¹⁸. Several biological mechanisms have been proposed including (i) oxidative stress due to low levels of haemoglobin, and (ii) increased production of norepinephrine followed by stimulation of corticotropin-releasing hormone due to iron deficiency leading to intrauterine growth restriction

In the present study, about 70 per cent of mothers in both study groups had anaemia during pregnancy. The proportion of maternal anaemia observed in the present study was in line with the World Health Organization report¹⁹, which suggested nearly 65-75 per cent prevalence of anaemia among pregnant Indian women. This finding directs that the management and control of anaemia during pregnancy should be enhanced to improve the health of the foetus as well as that of the mother. Further, the occurrence of moderate-to-severe anaemia was higher in the mothers of the SGA group as compared to the AGA group. Overall, 41 per cent of mothers in the SGA group reported haemoglobin levels <10 g per cent as compared to the 25 per cent in the AGA group. These observations indicate that maternal anaemia has a significant role in foetal growth. Further, delivery of SGA neonate is reported to be a significant cardiovascular risk factor for mothers. Further studies are required to clarify the relationship between maternal anaemia and SGA foetus and to determine whether healthcare during pregnancy has the potential to avoid the maternal and foetal complications. Our study had certain limitations. A clear differentiation between SGA and intrauterine growth restriction could not be performed in our study.

Many mothers were not on regular periodic antenatal monitoring, which impeded the accuracy of several variables such as body mass index, maternal weight gain, haemoglobin levels, placental histopathology, foetal middle cerebral arterial Doppler assessment and symmetric versus asymmetric pattern of intrauterine growth restriction in SGA newborns. Taking into account the financial and time constraints, the sample size was restricted to 100 with 1:1 ratio in both study and control groups. The selection bias was reduced by enrolling consecutive mothers admitted to the hospital. Another major limitation of our study was its inability to determine the cut-off lipid levels for cardiovascular risk stratification. In this context, a large longitudinal study is recommended to find out the clinical significance of higher lipid levels in SGA newborns and to estimate a cut-off level of lipids in neonates for categorization into higher, lower and no-risk levels for developing cardiac diseases in their adult life.

In conclusion, significantly higher cord blood levels of total cholesterol, triglycerides and LDL cholesterol were evident in the SGA group of newborns as compared to the AGA group of newborns. Hence, SGA neonates should be followed up regularly during their adolescence and adulthood to institute timely interventions to prevent rapid development of cardiovascular disease.

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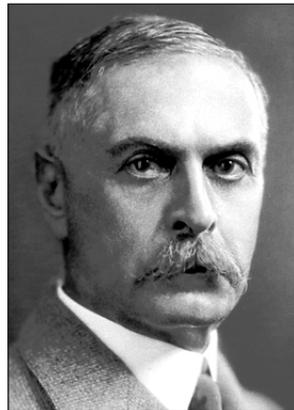


Dr. R. Chandrasekar

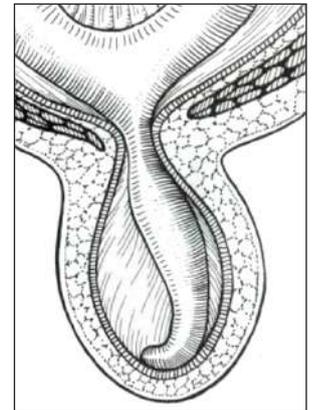
MBBS (JIPMER), MD Radiology (JIPMER)
 Fellow in Advanced Imaging (NIMS)
 MHA (ICFAI), PGDMLE (NLSIU)
 MBA Business Strategy and Leadership (ISB)
Editor, Insight Magazine
Executive Vice President, Yashoda Hospitals



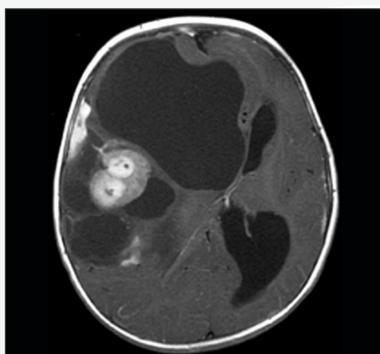
1. Name this condition caused by the deficiency of Niacin i.e Vitamin B3?



2. Identify the person in the picture credited for the basic blood group typing?



3. What is Hernia containing a Meckels diverticulum called?



4. MRI Brain of ten month old infant who presented with increasing head size, bulging fontanelles and irritability. Diagnosis?



5. Identify the person in the picture who made the historic defense against murder by claiming insanity?

ANSWERS: 1. Pellagra 2. Karl Landsteiner 3. Littler's Hernia 4. Desmoplastic Infantile Ganglioglioma 5. Daniel McNaughten



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