ON THE FRONTLINE OF MEDICINE

MIOT HOSPITALS
PUTTING PATIENTS FIRST

MARUTHUVA VIVEKAM

Doctors Advice - For a Healthier Life

Looking through the Spyglass

Technology has breached amazing new frontiers in Gastrointestinal Endoscopy

Plus:

The Road to Liver Cancer

In my own words

The Tale of two Brothers

May 2011 Vol:13

From the Chairman's Desk

Dear Friends,

I'm happy to be addressing you in this edition of Maruthuva Vivekam, which is back by popular demand. There have been several changes at MIOT. You may have noticed the rapid construction activity which is our new MIOT International block. MIOT International has been conceptualized to global standards and will take us to the next level. To help us in this task, many new departments and specialists have joined our Hospital. One of these excellent new departments is our Advanced Centre for GI and Liver Diseases.

There has been an alarming increase in the incidence of stomach and liver disorders and a crying need for a super specialist facility in Chennai. Through this Maruthuva Vivekam, we hope to create some awareness of these illnesses, their symptoms and treatment.

As always, I look forward to your feedback at enq@miothospitlals.com

Good luck and Good health!

Mrs. Mallika Mohandas
Chairman, MIOT Hospitals

Laughter is the Best Medicine

"When you deprive your body by dieting, it may interpret this a starvation and adapt as necessary to survive."

"Its tangier than most wine, but i love it. It's made from the tears of my competitors"

A Center for World Class Care

The MIOT Advanced Center for Gastrointestinal and Liver Diseases has already become extremely popular in the country and the surrounding countries. The center has a team of outstanding, highly skilled, well qualified specialists headed by Prof. Dr. George Chandy who was formerly the Head of the Department of Gastroenterology & Hepatology at Christian Medical College, Vellore and also has administrative experience as Director of the CMC Hospital, Vellore. He was one of the first to set up a Liver Clinic, and later, a Liver unit in the country. Apart from this, he was responsible for introducing several programmes in Vellore including Liver Transplant surgery. Besides, he has been one of India's pioneers in the field of Hepatology.

He has brought a team of specialists which includes highly skilful Endoscopists: Dr. S.C. Samal, Dr. Arulprakash and Dr. Manoj Sahu.

Dr. Samal is considered to be one of the most skilful Interventional Endoscopists in the country and he has organized a superb Center of Excellence for Advanced Gastrointestinal Endoscopy.

Dr. Arulprakash is a Pediatric Gastroenterologist and he is in charge of endoscopic procedures for children.

Dr. Manoj Sahu has specialized in Endoscopic Ultrasound and is an excellent clinician.

The Center has the best infrastructure and state-of-the-art technology. Besides Capsule Endoscopy, Double Balloon Enteroscopy, Endoscopic Ultrasound and High Resolution Manometry, there are facilities for Transjugular Liver Biopsy and all types of Interventional Radiology. There is a complete section for diagnostic and therapeutic procedures in children. The Center is the first in the State to have the SPY GLASS and ERBE JET, equipment which enable the Endoscopists to do cutting edge therapeutic work for the benefit of patients.

Liver Diseases are managed by Prof. Dr. George Chandy and Dr. Dinesh Jothimani.

Dr. Dinesh Jothimani has been working for several years in the Hepatology Department in the United Kingdom and I am happy to welcome him as one of the leading Hepatologists to MIOT Hospitals, Chennai.

The surgical part has an excellent team, which is headed by Dr. N.S. Balaji who has been trained and has been working for several years in various Universities in the United Kingdom. He is an outstanding Laparoscopic Surgeon and also does Laparoscopic Bariatric Surgery.

This world class Gastroenterology and Hepatology team will, I am sure, provide the people of Tamilnadu and the rest of the country with world class care in the detection and management of gastrointestinal and liver disorders including cancer. Patients from all over the world will benefit from this facility.

PROF. DR. P.V.A MOHANDAS

Under Attack

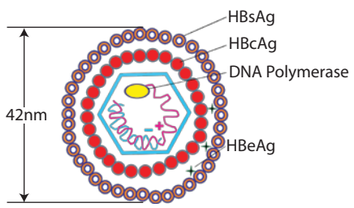
Alarming statistics show that almost 70% of Indians suffer from digestive disorders or worse…

Gastrointestinal and liver diseases cause significant mortality in our country. On rough estimate, 60-70% of our people suffer from disorders of the digestive system.

Diarrhoeal diseases, malabsorption and malnutrition lead to deaths or may result in physical and mental retardation. One in five child deaths in the world happen in India. A large proportion of these deaths are due to diarrhoeal diseases.

Deadly infections

Epidemiological studies have shown that 4-7% of our population have chronic Hepatitis B Viral Infection. **There are 350 million Hepatitis B virus infected people worldwide- 42 million of them are in India.** International data shows that approximately one million succumb to the infection every year.



Hepatitis B viral infection results in 10 times more deaths that AIDS in our country. Hepatitis B infection

can be prevented through immunization (vaccination) and can be treated effectively using antiviral drugs if identified early.

Hepatitis C Infection affects 1% of our people. Of the 11 million with this infection, the vast majority goes on to end-stage liver disease as the disease is detected very late. The spread of the disease is through improperly sterilized needles used for injections and unsafe blood transfusion.

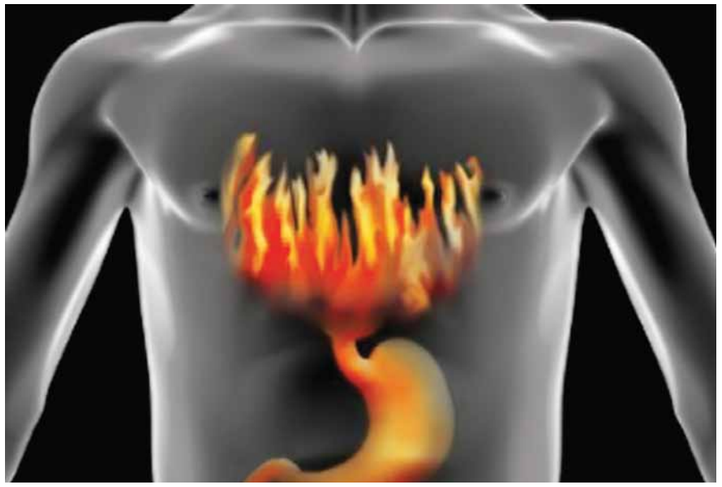
Drinking your life away

Alcohol induced liver and pancreatic complications are on the increase. Studies report that 18-24% of adult males consume alcohol, many of them, in excess of recommended volumes. **8 million Indians are reported to have alcohol induced liver disease and 1.5 million suffer from cirrhosis of liver.** This can lead to liver disease or cancer of the liver.

Hepatocellular Carcinoma **(Cancer of the liver)** is the fourth most common cancer in the world. **There are 14,000 new patients of liver cancer every year.**

Fatty liver is present in 20-30% of Indians. Non Alcoholic Fatty Liver Disease is a distinct clinical entity which is now known to lead to fibrosis and later cirrhosis. As the prevalence of Diabetes and cardiac disease increases, there will be a corresponding increase in those affected with fatty liver as well.

Did You Know?

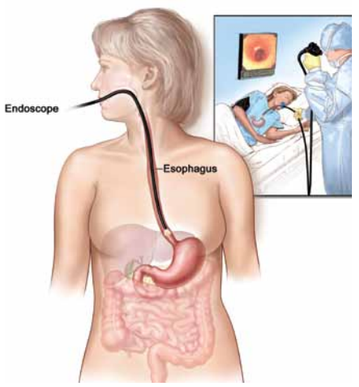


That Burning Sensation

Peptic Ulcer Disease results from bacterial infection. **Gastro Esophageal Reflux Disease** that causes burning in the chest affects 3-5% Indians. The corresponding figures in the West are 10-20%. It has been shown that 60% of patients who report to emergency clinics suspecting heart attack actually suffer from Gastro Esophageal Reflux Disease and therefore have a pain that is not cardiac in origin.

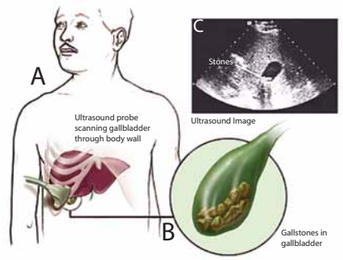
Other common diseases

Esophageal and stomach cancers are the third and fourth most common cancers in our country.



Early detection and treatment reduces morbidity and mortality.

Acute and Chronic **Pancreatitis** results in severe abdominal pain and complications that necessitate management in an intensive care. Alcohol and Gall stone disease are among the causative factors. 10% of Indians suffer from gall stones.



Hepatitis A and E as well as **Leptospirosis** (Rat bite fever) can result in acute liver failure. These can be prevented through active public awareness, good hygiene and prevention strategies.

Prof. Dr. George M. Chandy
MD, DM (Gastro), PGDHA, FRCP, FIHS

New Frontiers in Endoscopy

Stunning new technologies in endoscopy allow us to visualize the hard to reach areas for better results.

Endoscopy is a procedure that lets your doctor look inside your body. It uses an instrument called an endoscope, or scope for short. Scopes have a tiny camera attached to a long, thin tube. The doctor moves it through a body passageway or opening to see inside an organ. Sometimes scopes are used for surgery, such as for removing polyps from the colon.

Exploring the 'dark organ'

There have been several new developments in the field of GI (Gastrointestinal) endoscopy in the last decade. The small intestine used to be called the **'dark organ'** because it was not possible to visualize it endoscopically till recently. The same was also true in visualizing the biliary and pancreatic duct. Two recent technological developments have brought about a remarkable transformation in this area - Capsule Endoscopy and Spy Glass.

CAPSULE ENDOSCOPY

The Capsule Endoscope (CE) is the ultimate tool for endoscopic examination, because it is painless and extremely convenient for the patient.

All you have to do is swallow a capsule sized camera. This camera will travel through your intestinal tract just like your normal food, all the while taking pictures of the inside of the body.

During the procedure which takes about 8 hours, you live your normal life while over 50,000 colour images will be recorded onto a data-recorder worn as a belt around your waist. The capsule passes through the small intestine and is excreted naturally.

Painless and Sedation free

Capsule endoscopy has many benefits. The capsule is small and easily swallowed. It is a painless and sedation free procedure. You can relax and walk about. Exposure to potentially harmful radiation does not occur. Additional investigations can often be avoided, and you can go home the same day.

When to do CE

Capsule endoscopy is done for different indications. The main indications are diagnosis of obscure gastrointestinal bleeding, small bowel Crohn's disease, detection of benign and malignant small intestine tumours and other malabsorption disorders, etc. Capsule endoscopy will not be done if you already have a history of gastrointestinal obstruction or during pregnancy.

The Future of CE

The limitations of capsule endoscopy is that while it allows viewing, it cannot be used to obtain a biopsy specimen or for therapy. To counter the limitations, research and development is underway for endowing the capsule with a range of functionalities from tissue sampling for biopsy, to, actual treatment (interventional CE). In the near future, CE is expected to have a positive impact on many aspects of GI disease evaluation and management.

SPYGLASS

Endoscopic Retrograde Cholangio-Pancreatogram (ERCP) a specialized endoscopic procedure performed with fluoroscopy and contrast injection to examine and treat conditions of the bile ducts and pancreas - such as removing bile duct stones, opening obstructed bile ducts, obtaining biopsies of suspected tumors and removing pancreatic stones. Conventional ERCP is hindered by the flat, two dimensional, black and white image provided by fluoroscopy. 30% of diagnostic ERCPs are inconclusive, potentially creating the need for additional testing.

Enter Spyglass

For over 30 years, peroral cholangioscopy has been used to detect biliary pathology, guide stone therapy and obtain biopsies, but widespread use has been hampered by fragility, limited steerability, poor irrigation capabilities and the need for a second operator. The Spy Glass Direct Visualisation System addresses many of these limitations by being the first single-use direct visualization system that requires only a single physician operator and provides four-way steerability in a single-use catheter.

Its therapeutic implications include visualizing strictures and obtaining targeted biopsies of suspected cancer lesions of the biliary and pancreatic ducts. It can be used to target stones by laser beam and to fragment large stones.

Dr. S.C. Samal
MD, DM (Gastro)

Dr. Manoj Kumar Sahu
MD, DM (Gastro)

Lead Article

Case Study

In My own Words

Dr. Arun Kamath, a patient from UK describes his surprising experience at MIOT's new Department for GI and Liver Diseases

I am a middle aged Indian living in the UK. Every year I spend 6 weeks in Chennai with my mother. And I love her spicy Indian cooking! This time round, I was really being a pig, eating three spicy meals a day and indulging in non-vegetarian food twice daily. It was therefore not very surprising that eight days into my stay, I was suffering from heartburn

and feeling very bloated. I tried some over the counter antacid syrup and the usual home remedies, but nothing seemed to work.

"Oh! My aching stomach!"

My father had died of stomach cancer and I was getting worried. I rang my doctor friend in the UK. He suggested that I should go in for a gastroscopy (a camera test to look into my stomach) as soon as possible and not wait till I come back to the UK as my symptoms were getting worse. I asked around the usual family network and found that MIOT Hospitals had recently opened a very modern unit for stomach and liver ailments. Being a software

person, I emailed the hospital and was pleasantly surprised to get an appointment for the following day.

"Could I swallow a giant tube?"

I was told to have nothing to eat or drink in the morning and I reported at 10 a.m to the reception of MIOT Medical Block. Everything looked very clean. There was no "hospital smell" that one often experiences in most Indian hospitals. I was quite nervous as my mother had only the previous day told me about her very traumatic experience undergoing a gastroscopy six years ago at a hospital in another city in India. I wondered how I would be able to swallow a giant tube and tolerate it in my throat while the procedure was carried out.

A pleasantly dressed secretary, ushered me into the Department of Gastrointestinal and Liver Disease. The Director took me through the procedure. An anaesthetist was in the department in case I needed any sedation during the procedure. I understood that owing to my family history of cancer, some biopsy samples would also be taken during the procedure. I was then taken to the endoscopy suite. This was a spacious room with warm lighting

Case Study

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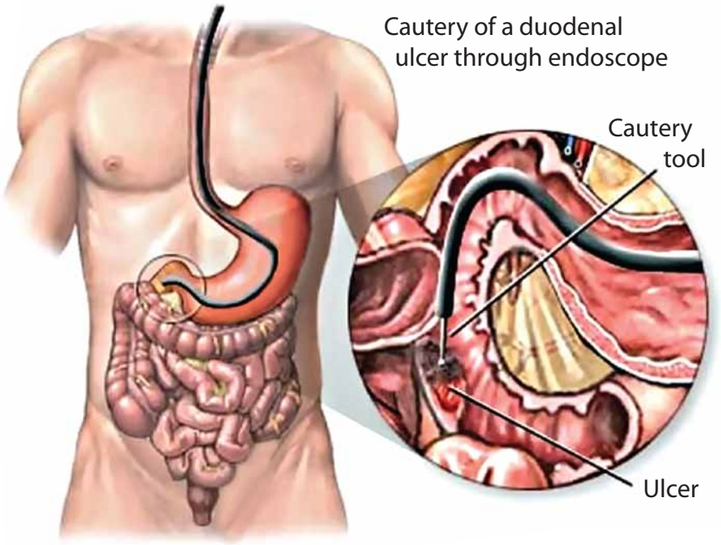
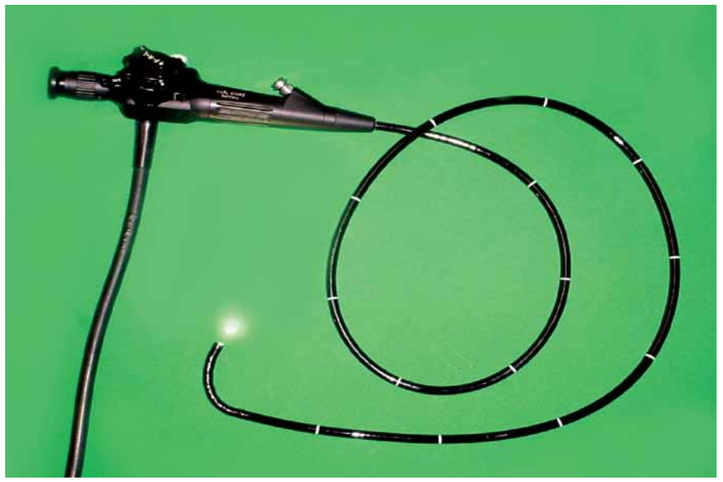
and a couch. The doctor walked in. He was a friendly 'teddy bear' like gentleman who immediately put me at ease. He sprayed a pungent concoction into my throat. Almost immediately, my throat went numb and I lay down on my side. A small protector was placed in my mouth and I breathed easily through my nose.

'A pair of metallic teeth grabbed my stomach'

I had previously wanted to view the entire procedure, so a small TV screen was place in front of me while the doctor looked at the big monitor in front of him. Quite a thin looking tube, slightly thicker than a straw, was gently placed in my mouth and I was asked to swallow. Lo and behold ! I found myself staring at what looked like my food pipe, on the TV screen. I was quite excited. The image then expanded into a bigger cavity which seemed to lead to another tunnel. I could not feel anything and did not gag or cough. The doctor explained that we were passing from the stomach to the duodenum. He showed me that I had an



inflammation of the stomach lining called gastritis and nothing else. He then said that a biopsy would be taken. I saw a pair of metallic teeth grabbing the stomach tissue. There was absolutely no pain. Suddenly, it was all over. The tube was out, I was sitting up and I still did not feel any discomfort! I was told that the numb feeling in my throat would wear off in an hour and I could then eat and drink normally.



"What a relief"

Fifteen minutes later I was heading home clutching my reports, advice and medication. All the things I loved, I was told to avoid for a month and then go back in moderation. I was given a months' medication for my gastritis. Three days later I received the biopsy results. I heaved a sigh of relief when I found that all the tissue samples were normal. In a week, my bloating had subsided and the burning sensation was gone. However, I was still off coffee, alcohol, spicy food and orange juice. I'd have to become a good boy now or my stomach would start playing up. At least it wasn't cancer! And the whole camera test seemed so easy. No wonder a whole load of people are coming over to India for medical treatment. You seem to have cleaner hospitals and better equipment than the UK!!

Dr. Prithvi Mohandas

Article

What you should know about ESOPHAGEAL and STOMACH CANCER

Can we prevent or atleast recognise the early symptoms of these common cancers? This article gives you vital information.

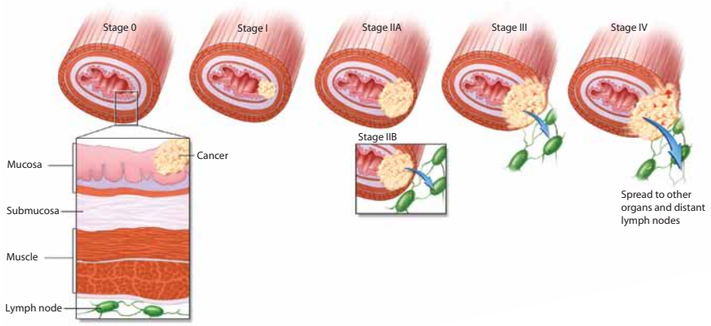
Esophageal (food pipe) and stomach (food reservoir) cancers are the commonest cancers of the gastrointestinal system in India. Esophageal cancer is the fourth most common cancer in Indian men and the fifth most common in Indian women.

What is most alarming is that these cancers have reached an advanced stage when the doctor sees the patient. This translates to an inability to cure the cancer that may have been possible with an early diagnosis.

The two main questions henceforth is

1. Can we do something to prevent getting these cancers in the first place?
2. How can we recognise and diagnose these cancers at an early stage?

that increase the chances of getting them. Hence it is important we understand them and act accordingly.



Prevention:

Although there is no guarantee that someone may not get either stomach or esophageal cancer, there are definite links between certain factors

Tobacco and alcohol are the most important factors that can increase the chance of developing esophageal cancers in addition to contributing to other cancers such as the lung, liver, pancreas etc. Hence avoiding or reducing the intake of alcohol and tobacco in any form will be a healthy step forward in attacking the fight against cancer.

Injury to the esophagus as a result of corrosive (acid, alkali) ingestion multiplies the risk of one getting esophageal cancer. Similarly Barrett's esophagus that is a result of long standing gastro esophageal reflux disease (GERD) has a higher chance of cancer transformation than the native esophagus. GERD is predominantly an increasing problem with modernisation of our lifestyle, dietary habits and sedentary lifestyle. Obesity, which is a global epidemic, is also associated with an increased incidence of esophageal cancer.

Hence avoidance of alcohol, tobacco, adopting a lifestyle with healthy dietary patterns and frequent

exercise that will decrease the chance of GERD and Obesity will all go a long way in promoting health and preventing cancer.

Early Diagnosis:

Cancer of the esophagus or stomach can be diagnosed at an early stage only if patients seek the attention of the doctor with symptoms. For that to happen, the major obstacle in India is the lack of awareness in the general population as to who should approach a doctor and when.

Symptoms that should alert the common man to the possibility of cancer in the stomach or esophagus include:

- Difficulty in swallowing
- Loss of appetite
- Loss of weight
- Prolonged persistent vomiting
- Lump in the abdomen (tummy)
- Vomiting blood or passing black coloured motion
- Anaemia

The above symptoms warrant urgent attention and investigation especially in people over the age of 50.

Investigations would include some simple blood tests and an endoscopy to look into the inside of the esophagus and stomach.
Upper Gastrointestinal (Upper GI) endoscopy is very sensitive in ruling out the presence or absence of cancer and is also useful in diagnosing other problems like ulcers, acid damage and infections which can be treated with appropriate medicines. Hence an endoscopy is strongly advised in the presence of the above symptoms in all age groups and more importantly in people above 50 years of age.

TREATMENT OF CANCERS OF THE STOMACH AND ESOPHAGUS.

Once the disease is confirmed, it is followed by assessment of the spread of the disease, to find if the cancer is at an early or advanced stage. The investigations usually involve CT scans and or some specialised form of scanning and X rays.

Once the stage of the cancer is verified the Oncology team which usually comprises of Gastroenterologists, Surgeons, Medical and Radiation Oncologists collaborate on which would be the best treatment suitable for the patient at that particular stage of disease.

Very early stages of cancer are potentially curable and complete surgical removal of the cancer with the associated organ involved (partial or complete) is all that may be necessary. Radiation and Chemotherapy alone may be curative at certain sites such as the upper esophagus.

However, when the disease is not at an early stage, combined modality of Surgery, Chemotherapy and Radiotherapy may be necessary, and that will be decided by the team treating the patient. This could still result in a cure when aggressively and appropriately managed by a multidisciplinary team at specialised centres that have the team of doctors and facilities to offer these combination therapies.

Following the completion of treatment, it is essential that the patients are regularly followed up and seen in the clinics at regular intervals. They may also need scans at specified intervals to look out for recurrence (coming back) of the cancer.

Advanced cancers that are beyond a stage of cure are usually managed by placements of endoscopic metal stents to help the swallowing process with or without chemotherapy.

Dr. N.S. Balaji
MS, FRCS(E), FRCS(G), FRCS(UGI), MD(USA)

Doctor's Diary

Mr. Nair discovers the Cutting Edge

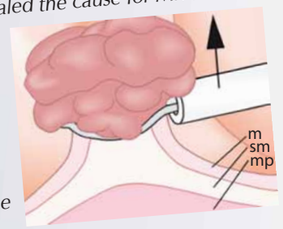
It gives me great satisfaction when we use advanced technology to save patients from what would otherwise have led to open surgeries. One such case was Balan Nair. For 6 months, this 42 year old gentleman was complaining of stomach disorders - sometime it was pain, sometimes indigestion. It got to a point where he began to dread having a meal. From the local clinic in his home town in Kerala to the nearest big hospital there, Mr. Nair made the rounds and received plenty of medication and advice. Unfortunately nothing worked.

Mysterious problem

Finally, directed by his well wishers, he found his

way to MIOT Hospitals Chennai and to our Advanced Center for GI and Liver Diseases. When I first saw his reports, he appeared healthy with no relevant family or past medical history. Even our preliminary physical examination and laboratory evaluation revealed no abnormality. We scheduled him for a GI endoscopy.

And thus was revealed the cause for Mr. Nair's long suffering. A 4x3cm long mass (polyp) in the anterior wall of the first part of the small intestine (duodenum) was responsible for his symptoms. Considering the size and location of the tumour most hospitals would have advised immediate surgery. But with the high level expertise and the state-of-the-art technology available at the Center, we decided to remove the tumor by endoscopy.



A good alternative to open surgery?

Now all of you may be aware of the endoscope as a method to visualize the stomach and intestines to identify the problems. Now the latest endoscopes allow us to obtain targeted biopsies and other therapeutic procedures. Using a regular gastroscope, we deployed two metallic clips on the stalk of the tumour to decrease the blood flow. The mass polyp (4cm×3cm), was removed without bleeding, by a single resection and sent to the pathology department. The specimen was identified as Brunner's Gland Hamartoma and was negative for malignancy.

Back to Biriyani!

Two months later when I met Mr. Balan Nair for his follow up, I found a new man. All his old symptoms had disappeared and he was back to eating his favourite aapams and biryanis. We repeated the upper GI Endoscopy which showed that there was no further recurrence of polyps at the site. It has been found that endoscopic or surgical removal of Brunner's Gland Hamartoma can prevent the development of complications. Where the site and the size of the polyp permit Endoscopic polypectomy it is the safest and most effective method of polyp removal with a favourable outcome. Mr. Balan Nair will agree!

Dr. Arulprakash
MD (Paed), DNB, DM (Gastro)

Dr. S.C. Samal
MD, DM (Gastro)

Article

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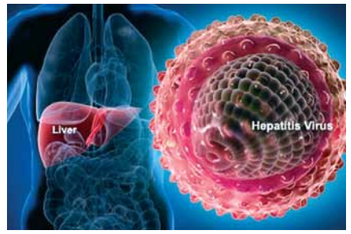
The Road to Liver Cancer

More infectious than HIV, Hepatitis B is the commonest cause of liver cancer



You may not know it but Hepatitis B virus (HBV) infection affects 3-4% of our population, which means that about 30-40 million Indians suffer from this infection. Most of them are unaware that they have this infection which is more infectious than human immunodeficiency virus (HIV) infection. What's more, HBV infection is the commonest cause of liver cancer around the world.

Stemming the Spread

HBV infection spreads through transfusion of injected blood, the use of infected injection needles or by mother to infant transmission. The spread of infection has decreased significantly in our country through safe blood banking practices and through voluntary blood donation. The use of sterile, disposable needles has also helped in bringing down the incidence of HBV infection. Most Centers now test pregnant women for HBV infection and prevent transmission of the virus to newborn infants.

Although awareness regarding HBV infection has improved, we still have a long way to go to prevent the spread of this deadly virus. The best prevention strategy is vaccination with Hepatitis B vaccine.

Unfortunately the cost of over **Rs.200/- per dose** is prohibitive. MIOT Hospitals has taken a lead to provide **Hepatitis B vaccination** for all at a **cost of Rs.25/-** per dose given at **0,1 & 6 months.**

Recognizing the symptoms

Mr. P.K, a 46-year-old Bank officer came to us with a history of abdominal fullness and decreased urine output. On examination, he was found to have fluid collection in the abdomen and swelling of his feet. He had contracted Hepatitis B infection earlier through blood transfusion. The virus targeted the liver, caused damage and destruction, which then resulted in his present condition.

In search of a solution

Fluid in the abdomen, vomiting of blood and drowsiness are features of worsening liver failure. Temporary treatment to give relief from the symptoms can be instituted, but, when the liver continues to deteriorate, liver transplantation will become necessary.

It is important to consult the liver team, so that a detailed evaluation can be arranged. Based on the findings, the patient will be entered onto the Liver transplant list.

There are two types of liver transplantation

- Deceased Donor Liver Transplantation
- Living Donor Liver Transplantation

In the first type, the donor liver is obtained from a brain-dead person, while in the latter, a suitable living donor donates a part of his /her liver. Liver transplantation is considered to be the ultimate team effort. The team consists of liver surgeons, liver physicians, anesthetists, intensivists, liver pathologists, nurses, psychologists, social workers, transplant co-ordinators etc. MIOT Hospitals is in the process of setting up a top quality Liver Transplantation team to provide a state-of-the-art, caring, holistic liver transplantation facility to assist patients with end stage liver disease.

Prof. Dr. George M. Chandy
MD, DM (Gastro), PGDHA, FRCP, FIHS

The Tale of Two Brothers – Fatty Liver and Metabolic syndrome

Have you been diagnosed with "fatty liver" and wondered what it was and whether it was a threat to your health?

At least 30% of the Western population is estimated to have non-alcoholic fatty liver disease, otherwise called **'fatty liver'**. It is the commonest cause of abnormal liver tests in the community and is closely associated with his 'big brother' the metabolic syndrome which is comprised of obesity, diabetes, high blood pressure and raised lipids.

An emerging health concern

Fatty liver is emerging as an important health issue of concern in both adults and children because it increases the risk of diabetes mellitus, high blood pressure, heart problem and death, significantly. It may be present in at least **70% of patients** with diabetes. India being the 'diabetic capital' one would anticipate much higher prevalence of fatty liver. In patients with this disease, the prevalence of metabolic syndrome is around 40%. Fatty liver, a manifestation of metabolic syndrome is characterized by fat deposits in the liver. Continuous fat deposition leads to inflammation in at least 40% of patients. Persistent inflammation leads to liver scarring (fibrosis) and eventually, to cirrhosis. Cirrhosis increases the risk of liver cancer several fold.

Difficult to Diagnose.

The symptoms for fatty liver - fatigue and elevated liver enzymes revealed in blood tests, are so generic that the disease goes undiagnosed till a late stage. Ultrasound is one method where the liver shows brightness but it's not easily detected.

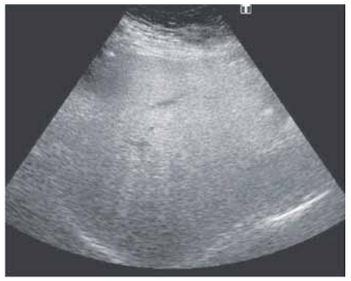
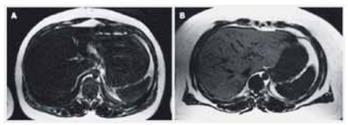


Figure 1. Ultrasound image of fatty liver showing increased brightness

Magnetic resonance spectroscopy (MRS) is a better test for the evaluation of liver fat but, is not readily available and is expensive. Once again it will not differentiate simple fatty liver to the one with inflammation.



MR spectroscopic images
A- normal liver. B- fatty liver

Liver biopsy is considered to be the 'gold standard' for detection and assessment of fatty liver It is readily available and helps to differentiate simple disease from one with inflammation. However, it is an invasive procedure with some rare but significant complications such as abdominal pain, bleeding, lung and bile duct injury and very rarely, death.

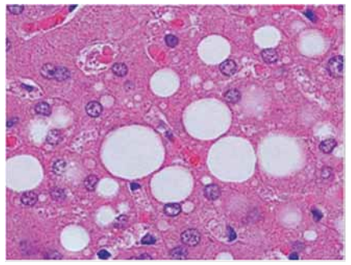


Figure 3. Liver histology showing fat globules in the liver parenchyma

Fibroscan is the latest tool developed by the French scientists to assess liver scarring. It is simple to use, non-invasive and cost-effective. It identifies patients with cirrhosis. It also helps to assess progression of fibrosis that occurs as a result of fatty liver.

Article

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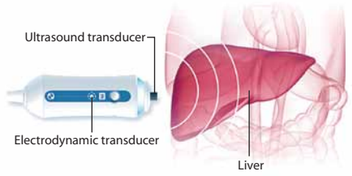


Figure 4. Fibroscan - a non-invasive tool for the assessment of liver scarring.

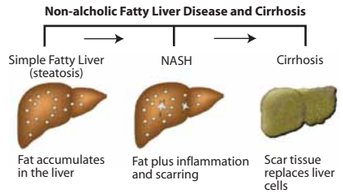
The current practice among hepatologists is to utilize combinations of **liver tests, ultrasound** and **fibroscan** in the management of fatty liver.

Investigations	Advantages	Disadvantages
Ultrasound	Good for screening, cheap, readily available	Not very sensitive
MR spectroscopy	good accuracy for liver fat	Expensive, Not readily available
Liver biopsy	Gold standard	Complications
Fibroscan	Measures liver scar	Will not estimate fat content

Table 1. Summary of various modes of investigations in the management of fatty liver

Mechanism of liver damage in fatty liver

Insulin resistance is the key problem in fatty liver and metabolic syndrome. Consuming food, high in carbohydrates result in an increased supply of fatty acid to the liver. Continuous influx of fatty acids increases inflammation and liver scarring, leading to cirrhosis.



Remedial Measures

Measures to improve insulin sensitivity remain the key for both fatty liver and metabolic syndrome management but there is no single effective therapy. Change in diet and exercise, along with medication and in rare cases, obesity surgery may be necessary. Weight loss of 5-10% over 6 months has been shown to improve abdominal fat and obesity. Rapid weight loss paradoxically exacerbates fatty liver and is hence not recommended.

Eating right

High calorie intake is one of the targets to address. Diet rich in carbohydrates and saturated fats should be avoided. Avoid food that contain 'trans-fat' which causes fat deposition and liver damage.

Poly unsaturated fats are recommended. Many soft drinks contain fructose that increases fat synthesis and should be avoided. A diet, rich in fruits and vegetables with limited meat consumption is strongly advised.

Working out

Exercise helps weight reduction, improvement in liver tests and decreases the risk of diabetes. Moderate exercise burning at least 400 calories per session 3-4 times a week is recommended.

Medication

New drugs are being evaluated around the world. Lipid lowering drugs have produced varying effects on the fatty liver and inflammation.

Surgery

Bariatric surgery is becoming increasingly popular. It improves liver fat and inflammation. Gastric bypass and laparoscopic gastric banding are some of the surgeries available for obesity. It should be considered only for morbidly obese (BMI>40) patients who are unable to lose weight by other means. Placement of balloon in the stomach is an attractive alternative to bariatric surgery. This temporary measure has been shown to improve liver enzymes and insulin sensitivity if the weight reduction was >10%.

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