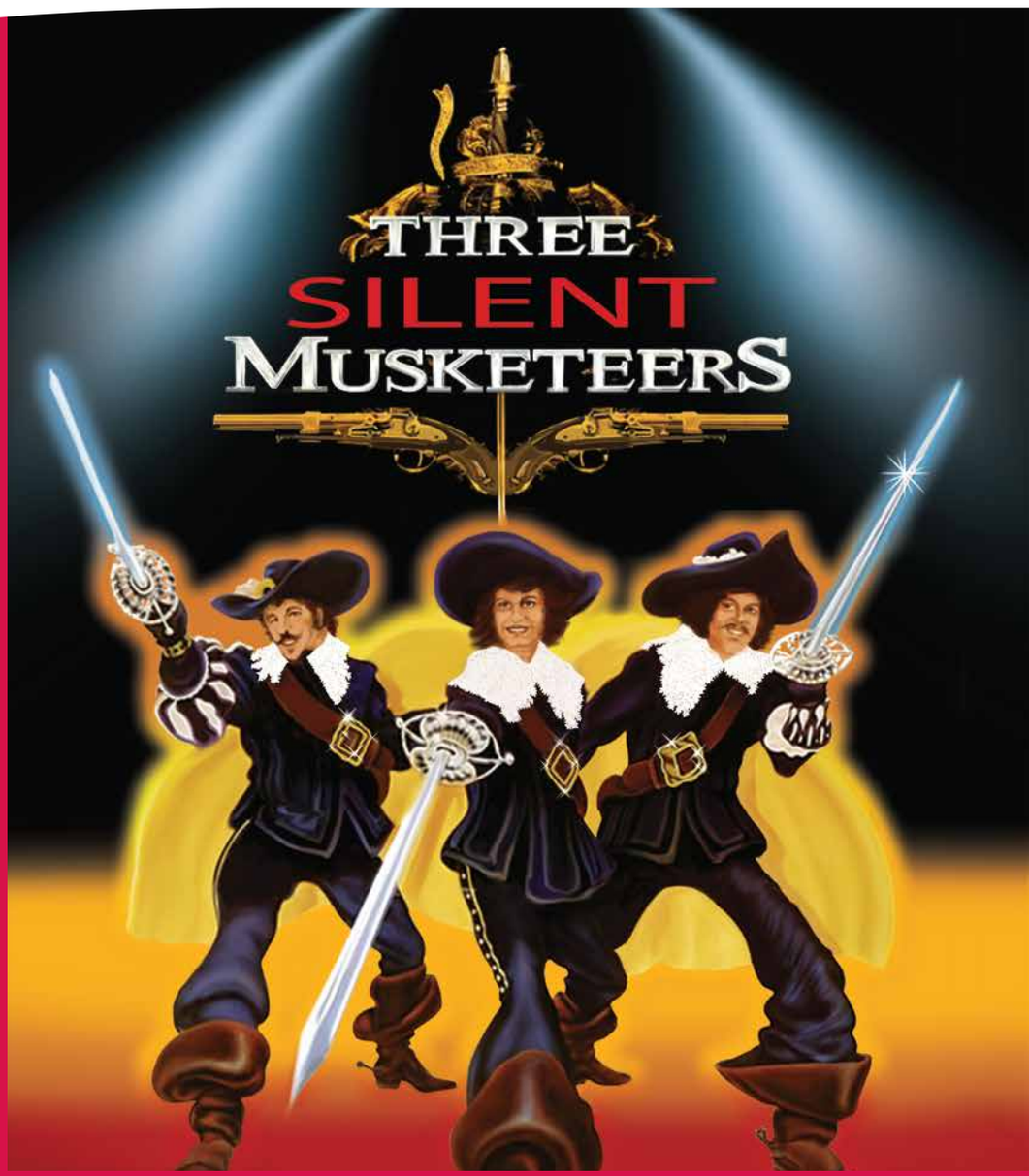
MIOT International

MARUTHUVA VIVEKAM



Cutting edge Hi-Tech Operations underway

MIOT Hepato Pancreatico Biliary Centre for Surgery and Transplantation

PLUS

Liver Transplants - No longer a last resort

Turning Minefields into Safe Zones

Working hand in hand with Nature

Feb 2014 Vol:17

From the Chairman's Desk

Dear Friends,

I am delighted to be connecting with you again. This issue focuses on our 'Three Silent Musketeers' - the liver, pancreas and gall bladder with the bile ducts, organs which do us great service, silently. Often, we take their silence for granted, as an indication that all is well.

Our food and lifestyles, which have undergone drastic changes in the last decade, have led to an alarming increase in the incidence of liver and pancreatic diseases among our people. They invariably get diagnosed at an advanced stage, requiring precision surgery or complex transplants.

We are proud to inform you that the state-of-the-art ***Hepato Pancreatico Biliary Centre for Surgery and Transplantion*** *at MIOT International, led by Prof. Dr. Surendran, one of the country's leading surgeons, tops the list of advanced centres in the specialty today.*

I take this opportunity to wish the entire Team all success.

I hope that you find this edition of Marthuva Vivekam both informative and thought provoking.

I look forward to your feedback at enq@miothospitals.com as always!

Good luck and good health!

Mrs. Mallika Mohandas
Chairman, MIOT International

Laughter is the Best Medicine

"According to the computer, I need to back up your kidneys, defragment your liver and reboot your heart."

"Diabetes has increased dramatically over the past 10 years. That proves that diabetes is caused by global warming!"

Specialist Care for the body's most complex organ system

Prof. Dr. P.V.A. Mohandas on why a dedicated department for Hepato Pancreatico Biliary Surgery and Transplantation

Diseases of the Liver, Gall Bladder, Bile Ducts and Pancreas are very common. The liver is insulted by most of us by drinking, by over eating, by starving etc. The liver is a very important organ in the human body. If the liver fails, nothing can be done and it is a miserable situation for people suffering from Liver Disease.

Jaundice is quite a common disease. But, many do not realize that it is very often caused by Hepatitis B virus or C virus and can lead to cirrhosis of the liver or liver cancer if not treated very vigorously. These infections can easily be treated by taking prophylactic injections. In our country, cirrhosis of the liver is most often caused by alcohol abuse.

In view of the high morbidity and mortality associated with diseases of the liver, gall bladder and pancreas, I have been thinking of a department which will deal with surgeries of these areas.

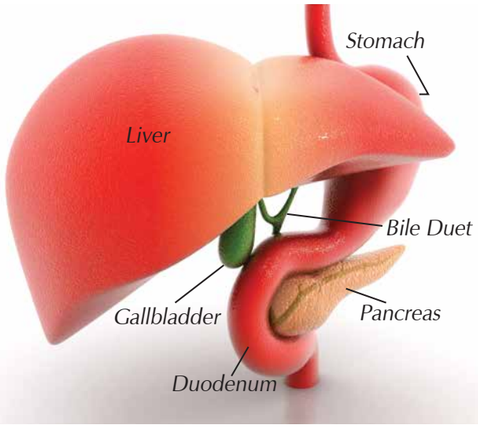
For any department you need a team and I am glad we have assembled this team, now headed by a famous Hepato Pancreatico Biliary Surgeon, Prof. Dr. Surendran, who is the first Liver Transplant Surgeon in India.

He has assembled a team consisting of Dr. Paari Vijayaraghavan, Dr. Ajitabh Srivatsava, Dr. Partheeban, Prof. Dr. George Chandy, Dr. Arul Prakash, Dr. Arun and Dr. Miriam Thomas.

I am glad that this team is already very successful and they perform very many difficult surgeries on the Liver, Bile Ducts and Pancreas.

I wish them great success and we shall provide them necessary infrastructure, even more than what has already been provided, to make it the world's best centre for this speciality.

Saying 'Hello' to the Three Silent Musketeers

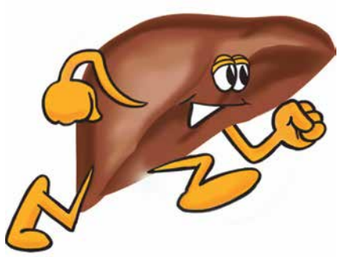


"All for one and one for all" was the battle cry of the legendary 3 musketeers. The same can be said for the 'musketeers' of the human body - the liver, pancreas and gall bladder with bile ducts, which form the hepato pancreato biliary system. Together they are a formidable group, responsible for over ***3600 functions*** *in the body, including processing of food, absorption of nutrition and disposal of toxins and waste. Yet, how much do we actually know about each of these organs?*

The Liver: Taking resilience to a whole new level!

From Biology lessons in school, you probably know that the liver is a triangular shaped organ that sits just under your rib cage, on the right side of the abdomen. It is your largest internal organ and the most resilient. It is the only organ with the ability to come back to normal function within 4 weeks even after 75% of it has been damaged or removed in surgery - provided necessary care is taken in time.

Your liver is your most hard working organ. Besides producing bile that is essential for the processing of food, it detoxifies and removes toxins, manufactures proteins and stores energy! It is also your body's storekeeper and personal bodyguard as it zealously stores vitamins, minerals and iron, besides making clotting factors and protecting the system against germs.



However, your liver isn't indestructible. And you can have serious complications if you develop liver problems. What is alarming is the fact that you will not have noticeable symptoms until about 80% of the organ is damaged, often beyond repair.

Your Pancreas: Having the last laugh?

When you visit the dentist to take care of a troublesome tooth or your ophthalmologist for an upgrade on your trusty reading glasses, one of the questions they are most likely to ask you is **'Are you diabetic?'**. Has it struck you that these people are asking you a question that has no relation to the problem at hand?

The pancreas is perhaps the most ignored organ in our system. However, it is one of the most important and should not be overlooked - as any **diabetic** will tell you.

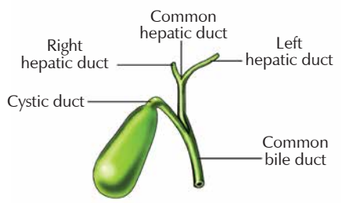
Located behind the stomach in the upper part of your abdomen, it is small at only 18 cm long and 4 cm wide. It is the main digestive organ and performs two kinds of functions: exocrine and endocrine.

It produces the digestive 'juices' that are necessary to process carbs, fats and proteins, as well as the insulin which controls the amount of glucose in the blood stream.

Once your pancreas stops functioning normally, i.e., once you are diabetic, almost every aspect of your life is affected. Diabetes interferes with your body's response to medical treatment for any condition, the way you heal and your quality of life in general. When you turn diabetic it is almost as though your pancreas is having the final laugh after being ignored all along!

The trusty sidekicks!

The gallbladder is a narrow organ, about 8 cms in length and 4 cms thick, that sits just below the liver and plays the role of a digestive aid. It serves as a storehouse for the bile produced in the liver, releasing it into the duodenum when food containing fat enters the digestive tract.
The bileducts are tube like structures



that serve as the channels through which the bile is transported through the liver, gall bladder and pancreas to the intestine.

Article

Seamlessly interconnected

These organs are a team that works in tandem; its most vital function - the processing of food. For example, the pancreas secretes **insulin** that is necessary to metabolise glucose but the actual processing and storing of glucose takes place in the liver.

Another instance is the **digestion of proteins and fats**. Once again, the pancreas produces the enzymes that are essential to their digestion, but the final steps of the process take place in the liver.

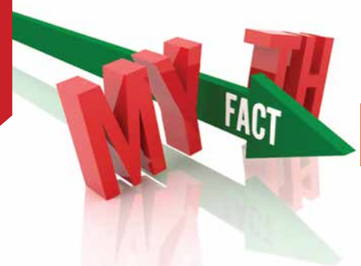
While the liver is responsible for the detoxification of drugs and toxins, the bile ducts expel them from the body.

When one of these organs fails or is diseased, it affects the other three. An indicator of cancer in the pancreas is often **jaundice** as the bile ducts are blocked.

Diabetes affects the liver; indeed it affects a number of processes in the body. Gallstones can slip into the bile duct and cause acute pancreatitis, which can be life threatening.

This interconnectedness is one of the reasons why surgery on these organs is complex, as they are also connected to a number of vital blood vessels. Both the bile and the pancreatic juices are extremely **corrosive** to the extent that they dissolve suture materials, blood vessels and tissue. This characteristic can lead to bleeding and leaks.

All for one and one for all.
There's no better demonstration of this than in the often ignored Hepato Pancreato Biliary system.



A few myths about liver and pancreatic disease - busted!

Myth: Only alcoholics get liver disease

FACT: Not true. Today, the incidence of **non-alcoholic fatty liver disease**, which is not associated with excessive or prolonged intake of alcohol, is the highest among liver diseases. Vulnerable groups include those who are obese, diabetics and people with high levels of cholesterol and triglycerides (fats) in their blood. Hepatitis B and C (spread by sharing needles and unsafe sexual practices) and Hepatitis A (spread by unhygienic food and water) are other important causes of liver disease.

Myth: Alcohol can damage the liver only when taken in excess

FACT: Any amount of alcohol can cause damage to your liver and pancreas.

Myth: Stopping alcohol intake when one already has advanced liver disease is useless

FACT: Abstaining from alcohol is beneficial even to those with advanced liver disease. Studies show that people with advanced liver disease (cirrhosis) who have stopped drinking have about a 65% chance of surviving atleast the next 5 years!

Myth: Fatty liver disease only affects fat people

FACT: Thin people or those of average build can also get fatty liver disease. Although people who are obese or diabetic are at greater risk for it, those who do not have these risk factors can also develop the disease. It is caused by a lifestyle that results in a build-up of fat deposits in the liver cells.

Myth: Pancreatic cancers are incurable

FACT: Though it is true that many of the pancreatic cancers are diagnosed at a very advanced stage, they can be cured by surgery and chemotherapy/ radiation if they are caught early.

Myth: Pancreatic cancer only affects older people

FACT: Pancreatic cancer is rarely found among 30-40 yrs segment but its incidence increases sharply after the age of 50. Smokers and people with a family history of pancreatic cancers should get screened regularly for early detection of the disease.

Myth: A person with no family history of pancreatic cancer has little or no risk

FACT: Hereditary causes account for only 5% to 10% of all the pancreatic cancers diagnosed yearly.

Myth: Quitting smoking doesn't help to lower pancreatic cancer risk in an individual who has smoked for most of his or her life.

FACT: Studies show increase in risk of pancreatic cancer as the amount and duration of smoking increases. Long-term smoking cessation (>10 years) reduces risk by approximately 30%.

Champions of the Three Silent Musketeers

*Leading the charge against challenges of the body's most complex organ group - the **Hepato Pancreato Biliary System***

Not too long ago, if you had an ailment that affected your liver, stomach, gall bladder or biliary tree, you would be visiting a general surgeon or a GI specialist. Today, our understanding of the digestive system has convinced us that the liver, pancreas and hepatobiliary tree, which together form one of the most complex organ systems in the body - **the hepatobiliary system** - need to be focused on separately.

With delayed symptoms being a characteristic of this speciality, **60%** of patients who come in are diagnosed with tumours. Today, there are very few healthcare centres in India which offer the highly specialised care that they require, **particularly in surgery and transplants**. Thus, the **MIOT Hepato Pancreatico Biliary Centre for Surgery and Transplantation**, a dedicated unit under the banner of the MIOT Advanced Centre for Gastro Intestinal and Liver Diseases, was set up to take on the challange.

Top-notch Team with a Wholistic approach

The success of this speciality lies in the specialists who man it. At MIOT International, the Centre is led by a team of highly skilled and experienced hepatologists, hepatobiliary surgeons and transplant surgeons, who rank among the best in India and abroad. They adopt a wholistic approach to treatment, integrating surgery with newer modes of treatment like interventional radiology, transfusion medicine, oncology etc. This ensures better results and comfort to the patient during treatment and later. The Team includes dedicated anaesthesiologists, radiologists, nursing staff, dieticians and physiotherapists.

Comprehensive, Advanced Support - Under One Roof

Cutting-edge imaging and visualisation facilities: They cover advanced CT and MRI scans (incl: the Fibroscan (ARFI) for early liver scarring) and endoscopic methods (incl: the latest endoscopic ultrasound).

World class 24-hr Laboratory: The laboratory, ranked 8th globally, has a dedicated division for Transplantation, Immunology & Molecular diagnostics, which provides valuable support for liver transplants by way of biopsies, antibody testing, genetic markers for cancers etc.

Introducing

Together, they allow surgeons to diagnose accurately and quickly, and even treat simultaneously (in certain cases).

State-of-the-art Blood Bank: It ensures round the clock reserves of leucodepleted blood maintained at international standards, a critical necessity for this speciality.

Transfusion Medicine Unit: This facility offers sophisticated component therapy, whereby essential blood components necessary for Transplant patients are made available.

Radiotherapy: In certain cases patients who have completed surgery need radiotherapy to ensure complete removal of cancerous cells. At MIOT, they can undergo planned cycles of radiotherapy with the world's most advanced radiotherapy machine - the **TrueBream STx**.

New Age Operating Theatres

Our surgical facilities are on par with the best in the world to ensure patient safety.

A set of **twin** state-of-the-art operating theatres with HEPA filter and laminar airflow dynamics ensure infection free environments. They are equipped with advanced instrumentation for both **open** and **keyhole surgery**.

They are also supported by a range of highly specialised and user friendly devices* to control & prevent bleeding and manage blood flow of patients during surgery. These include the intra-op cell savage device, rapid infuser system, cavitron ultrasonic suction aspirator, veno-venous bypass circuit and ROTEM thromboelastometry.

They enable our surgeons to perform the most advanced surgeries and transplants unhindered.

Patients, post surgery, recover in dedicated **infection-free ICUs** under the supervision of trained intensivists and nurses.

Collaborative Caring

Patients benefit from the unique culture at MIOT where surgeons consult on their case with full time experts in connected specialities like oncology, cardiology, nephrology etc., to give them the best possible outcomes in this highly complex speciality.

Some of the procedures performed at the MIOT Hepato Pancreatico Biliary Centre for Surgery and Transplantation are:

Biliary System

- Cholecystectomy
- Excision of choledochal cyst and bile ducts
- Repair of bile duct injuries
- Right, extended right, left and extended left hepatectomy with excision of bile duct
- Radical cholecystectomy with excision of bile duct.

Pancreas

- Whipple's procedure and PPPD
- Central pancreatectomy
- Distal pancreatectomy, open and laparoscopic
- Subtotal pancreatectomy/ Total pancreatectomy
- Pancreatojejunostomy
- Frey's procedure
- Pancreatic necrosectomy
- Cyst enterostomy and cyst gastrostomy
- Tumour enucleation (pancreas)

Liver

- Right hemihepatectomy
- Left and extended right hepatectomy
- Monosegmentectomy
- Central liver resection non-anatomical segmentectomy
- Hepaticojejunostomy
- Cirrhotic liver resection
- Hepatopancreatoduodenectomy
- Radiofrequency ablation
- Laparoscopic procedures: deroofing of cyst, hepatectomy, metastatectomy, laparoscopic mobilization of liver to assist in donor hepatectomy
- Liver transplant (cadaver and live donor)

**The devices mentioned in this section are discussed in detail on the nexe page.*

Article

Turning Minefields into Safe Zones

Find out how modern technology gives surgeons the edge in HPB surgery, an area fraught with complications

The days when a diagnosis of **'pancreatic or liver disease'** sent most patients into a spiral of despair should soon be over. While the disease continues to get discovered at an advanced stage due to poor screening, there have been dramatic improvements in surgical technology & treatment facilities. This is reflected in much better outcomes in surgeries and transplants, which are the main treatment options at advanced stages.

New Age Theatres

Surgery on the liver and pancreas has always been considered a minefield fraught with all kinds of complications: the risk of bleeding, tissue that cannot be repaired with sutures, leakage of extremely corrosive enzymes and complicated organ placement.

The newfound success of hepatobiliary surgery is largely due to the surgeon's increasing ability to **control, regulate and manage blood flow and clotting during the surgery**. He has been greatly aided by state-of-the-art operating theatres, such as the ones at **MIOT International,** which are equipped with advanced, intelligent and user friendly devices that handle all possible hindrances in this speciality. Our highly skilled surgeons work confidently in sensitive and difficult to reach areas to root out disease and save lives.

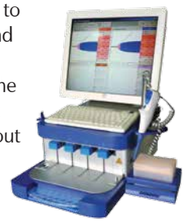
Life saving dynamos

- Patients could lose blood at approx. 1-2 litres in a matter of minutes from the time an incision is made. Replacing it in such large quantities is not feasible; therefore it is necessary to collect and reinfuse the patient's blood at the same temperature as the blood within. This is done using the **Intra-op Cell Salvage** device, which collects the blood efficiently, and the sophisticated **Rapid Infuser** system which reinfuses it back into the patient, **50 times** faster than normal infusers.

- The **Cavitron Ultrasonic Suction Aspirator** helps identify the major blood vessels, which can then be safely separated and secured out of the way, allowing surgeons to visualize better and access complicated areas without hindrance.

- Sometimes regular imaging before surgery may not have revealed the exact extent of disease owing to difficult organ placement. The highly sensitive **Intra-operative Ultrasound** helps surgeons in the theatre to identify very small lesions, lesions hidden between vessels and differentiate between operable and inoperable tumours. It also confirms blood flow **after** a transplant.

- During hepatobiliary surgery, particularly transplant surgery, major veins are clamped. This can decrease the amount of blood returning to the heart, reducing blood pressure and blood flow to other vital organs. The **Veno-venous Bypass Circuit** redirects blood flow from the legs and abdomen to the heart without passing it through the liver. This allows surgeons to perform complicated procedures with controlled blood loss, but without endangering other vital organs.
- Liver disease affects clotting function, often causing the body to automatically dissolve clots due to falling platelets and other essential clotting factors. The risk of the patient silently bleeding out (internally) is therefore a major concern during and after surgery. This threat is countered with the **ROTEM (thromboelastometry)**, which analyses blood samples rapidly and provides reports that accurately pinpoint defects, allowing specialists to react quickly.



Through the keyhole

Hepatobiliary surgeries using the **keyhole technique** are undertaken by very few centres today because of the high degree of expertise and infrastructure they require. At MIOT, we perform laparoscopic surgeries on the liver, gall bladder or pancreas regularly with cutting edge **high-definition (HD) laparoscopy equipment,** which allows surgeons to visualize and approach difficult areas confidently. Use of the **harmonic scalpel** for sealing of blood vessels makes it a superior alternative to the traditional knotting procedure. Patients heal faster with less discomfort and smaller scars.

A definite edge

Today technology has given specialists the means to screen and detect disease at the earliest stages, as well as treat it with minimal trauma to the patient. In combination with **super subspecialisation**, which is the norm today, patients have a better chance than ever of beating diseases that affect the silent organs of the body.

Article

Catching them early - Easier said than done!

An honest look at one's lifestyle, followed by preventive screening, seems to be the only way to help oneself when it comes to diseases involving the liver, pancreas and gall bladder.

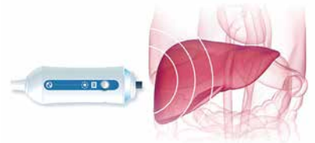
If prevention is better than cure, then catching and treating disease early is the next best thing. However, this is easier said than done when it comes to the three silent musketeers of the human body: the liver, pancreas and gall bladder, which continue to function normally even when they are diseased. While they have clear organ specific symptoms, patients experience them much later.

This silent disease progression, characteristic of these organs has led to **60%** of patients coming in being diagnosed with **cancer** of the liver or pancreas.

Silent in health and sickness

While today surgery and transplant of the liver, pancreas, gall bladder & bile ducts are considered safe treatments, diseases are best handled in the earlier stages.

Regular screening done on advanced screening machines, such as the ones available at MIOT International, could mean that these diseases are picked up and treated early with better outcomes.



3 pronged disease prevention strategy:

- **Be aware** - of the risk factors that could increase your chances of disease, as well as disease symptoms
- Limit your **exposure** to these risk factors
- Ensure that you sign up for **preventive screening** at regular intervals

Risk factors to look out for:

- Alcohol consumption
- Smoking
- Unsafe sex practices
- Sharing unsterile needles (drug use, tattoos, piercings)
- Overweight and obesity
- Diabetes
- Family history of liver / pancreatic disease

Technology vs. Disease

Great strides have been made in medical technology that allows us to now 'catch' and literally stop disease in its tracks.

The Hepato Pancreatico Biliary Centre for Surgery & Transplantation at MIOT has the latest screening & diagnostic tools, from liver function tests and advanced tumour markers, to cutting-edge endoscopic techniques such as the Spyglass system, and the ARFI scan for liver scarring.

Common diseases of the Hepato Pancreato Biliary System

Disease	Possible Symptoms	Diagnostic Tests
Gallstones	Fever, pain in the right side of the abdomen	Ultrasonogram
Bile Duct Obstruction	Jaundice, abdominal pain, fever	Magnetic Resonance Cholangiopancreatography (MRCP), Endoscopic Retrograde Cholangio Pancreatography (ERCP), Endoscopic Ultrasound (EUS), Ultrasonogram
Cancer of the Bile Ducts	Jaundice, history of passing white stools, itching all over the body, significant loss of appetite, loss of weight	Magnetic Resonance Cholangiopancreatography (MRCP), Endoscopic Ultrasound (EUS), Endoscopic Retrograde Cholangio Pancreatography (ERCP), CT scan
Liver disease such as Viral Hepatitis	Fever, weakness, loss of appetite, jaundice	Liver function tests, Ultrasound
Advanced Liver Disease	Jaundice, swelling of abdomen and feet, vomiting of blood, drowsiness	Fibroscan (ARFI), Liver function tests, Ultrasound
Liver Cancer	Mild abdominal pain, severe loss of appetite, loss of weight	CT scan, MRI, Liver function tests, Ultrasound, Tumour markers
Acute Pancreatitis	Severe abdominal pain which radiates to the back and is relieved on leaning forward	CT scan, S.Amylose, Endoscopic Retrograde Cholangio Pancreatography (ERCP)
Chronic Pancreatic Disease	Abdominal pain, loose stools and diabetes mellitus	CT scan, Endoscopic Retrograde Cholangio Pancreatography (ERCP)
Pancreatic Cancer	Pain in the abdomen, severe loss of appetite	CT scan, Endoscopic Retrograte Cholangio Pancreatography (ERCP), Tumour markers, Endoscopic Ultrasound (EUS)

Lead Article

Liver Transplants - No longer a last resort

*While the first liver transplant was performed in the USA 50 years ago, it continues to be offered by only a few Indian healthcare institutions. The transplant surgeon's expertise at critical moments remains key to the success of this most complex surgery. However, advances in operating room technology, surgery and anaesthetic techniques have improved safety and patient outcomes dramatically. One of the country's **leading liver transplant surgeons**, **Prof. Dr. Surendran**, demystifies this procedure. He explains why patients and the medical community should consider it as a **'curative option'** earlier in the disease phase rather than a last resort.*

Q Why is liver disease so feared?

A Your body cannot function if your liver stops working. Unfortunately, you remain unaware that it is damaged because there are no indicators until the damage is advanced. Also, until recently, surgery in this most vital organ was considered risky because of the nature of the tissue and the non-availability of facilities available to handle it.

Q How is liver surgery safer today?

A Bleeding is one of the biggest complications in a liver surgery, limiting both viewing and operating space. In the last decade, technology, surgical techniques, and medication have combined to control this hindrance dramatically. We are therefore able to operate on this tricky organ with much greater confidence.

Q What are the challenges to liver transplantation in India today?

A Expertise, technologies and infrastructure are no longer drawbacks, atleast in India. The main challenge today is the fear in our people brought about largely by lack of confidence among the medical community. If the general public knew of the success rates in liver transplants today and the medical community was made aware of the progress in this speciality, I am sure that they would see it a **'curative option'** than a **'last resort'**.

Q When is a liver transplant considered?

A Currently a liver transplant is considered when the body breaks down completely - your own liver can no longer eliminate drugs and toxic substances from the body, make immune factors that help you resist infections or make new body proteins. Advanced cirrhosis, certain liver cancers, inherited and congenital diseases are some of these conditions. These patients can have a better quality of life if a transplant is taken up earlier.

Q When is a donor liver deemed suitable?

A Surgeons consider the donor's blood group, age, medical condition, the size of the donor liver, and the amount of fat in the liver (steoasis) to decide on suitability of the donor liver. At MIOT, we do not accept a donor liver unless it meets with the **Gold standard** specs laid down internationally.

Q Where does the donor liver come from?

A The donor liver could come from a brain dead person or a living donor. Most transplants are done with a cadaveric organ. The patient's diseased organ may be replaced with a whole or part of a healthy liver.

Q What is required for a successful liver transplant?

A A liver transplant is the **most complex surgery** in medical science and requires sophisticated facilities. These include advanced imaging, radiology and laboratory services, state-of-the-art surgical and ICU facilities, a dynamic blood bank and component therapy, specially trained nursing staff and counsellors. Most important is the expertise of the team, which includes hepatologists, transplant specialists, anaesthesiologists, oncologists, interventional radiologists, infectious disease specialists, nutritionists and physiotherapists.

Q What is the survival rate?

A The success of the transplant depends on the quality of the donor liver and the conditions under which the transplant has been done. With the right facilities and expertise, such as those at MIOT International, over 90% of patients who undergo a liver transplant go on to lead normal, productive lives.

Q When can one resume normal activity after a transplant?

A Most people are able to return to a normal routine within 6-12 months after a successful liver transplant. Physical and sexual activity may be resumed when desired, following your doctor's guidance.

Q What lifestyle changes does one have to make?

A Patients will have to be meticulous about personal hygiene and abstain from alcohol. You will have to take immunosuppressants (medication that suppresses your immune system) for the rest of your life to prevent rejection of the donated liver.

Q How is a donor affected after donation?

A Following a resection for the donation, a donor's liver regenerates with almost 100% function within 4-6 weeks. Almost all live donors are discharged within 7 days of surgery and can resume normal life in about a month.

Q How can one become an organ donor?

A If you wish to be an organ donor, you should discuss your decision with your family and carry an organ donor card from a registered organisation.

Q What does the future hold for 'liver transplantation?

A Technology and surgical techniques continue to evolve. Adult living donor transplantation and paediatric living donor transplantation are definitely on the cards at MIOT in the near future.

Case study

Working hand in hand with nature

Superspecialisation & Nature, both heroes of the day

Aruna Venkatakrishnan, a 38 year old mother of two was a very sick person. A year after she'd had her cancerous gall bladder removed, the cancer had recurred - this time in her liver. It had also invaded the part of her small intestine that was connected to her bile duct, causing severe bleeding. In fact, her condition was so serious that she needed over 20 blood transfusions in the course of a month. Was there anything to be done?

Many minds, many hands, one goal

Although Aruna's situation was complex, her doctors at MIOT International were determined to find a treatment plan that would rid her of the cancer without compromising on her quality of life. The **Tumour Board**, comprising of hepatobiliary & GI surgeons, endoscopists, oncologists and interventional radiologists, discussed treatment options and decided to remove the **diseased portion** of her liver. But before they went into surgery, they needed to do a bit of prep - and call on the expertise of a few others to assist them.

Giving Nature a hand

Aruna was young and relatively healthy which gave the MIOT team reason for hope as they placed much emphasis on the body's natural regenerative powers. They planned to give Aruna's body time - **time** for the healthy portion of her liver to regenerate before the surgery - so that she would still have a fully functional liver even after the cancerous portion had been removed. The approach was explained to Aruna's family - it was after all a decision that required patience from all quarters.

First, the **interventional radiologist**, in a rare procedure called a **portal vein**

embolisation, diverted her blood supply to the part of her liver that would remain after the surgery. The **endoscopist** then slowed the bleeding temporarily using a technique that few centres offer - endoscopic argon plasma coagulation. Meanwhile the nutritionist worked to build her system up.

In a month's time, Aruna's liver had grown to **1.5 times** its normal size. She was declared ready for surgery by the doctors, including the cardiovascular and respiratory specialists.

During the surgery, her surgeons removed all the cancerous tissue and stopped the bleeding. **Intensivists** monitored her throughout the post operative phase and there were no complications, while **physiotherapists** worked to get her mobile quickly and comfortably.

In the final stage, **Radiation oncologists** gave Aruna a carefully planned cycle of radiotherapy to ensure that the cancer was destroyed completely. Three weeks after her surgery, a **cancer-free** Aruna went home.

Making the difference

Surgery is a **team sport**. Nowhere is this more evident than, perhaps, in surgery of the liver, pancreas and biliary system, which demands the expertise of **14** specialities. Ultimately success or failure, particularly in this speciality, depends on the doctors' knowledge of the miracle that is the human body, and their expertise which tells them when to hold back, when to be aggressive, and when to simply give Mother Nature a helping hand and let her take her course.

What has changed?

Better understanding of the human anatomy and its functioning has led to super-specialization, which is now the norm at leading centres such as MIOT International. Any major surgery of the complex liver pancreatic biliary system is, today, viewed as the sum total of **multiple smaller procedures** and treatments, each accomplished by a team that has specialised in that specific area of medicine. All to give patients the best possible outcomes at every stage of their treatment.

Case Study

In our own words

43 year old Siddharth, was an only son and father of two. Unfortunately he was also very sick and running out of time. His liver was failing and he desperately needed a new one. Swetha, his wife, recounts the experience of her husband's liver transplant at MIOT International.

A damaging lifestyle

My husband is a businessman and lived a lifestyle that was far from healthy. Unhealthy eating, alcohol consumption and a sedentary existence had taken its toll on his liver, which had become irreversibly damaged. He needed a liver transplant and soon!

Uncertain days

Siddharth was put on the transplant list at MIOT International and the waiting began. He had jaundice, pain in the upper abdomen and a belly bloated

up with fluid. There had been a liver available shortly after he was put on the list but his doctors rejected it as it did not meet the gold standard for a donor organ. As much as they wanted him to get better, they would not compromise.

An end to a seemingly endless wait

Almost 3 months after he had been put on the transplant list, we received the call from MIOT International. They told us that there was a matching liver for Siddharth and asked us to get him admitted. An hour after we had received the call, we were on our way to Chennai.

As soon as we arrived at MIOT, Siddharth was taken in for tests to ascertain that he was well enough for surgery. I learned that a team of doctors from the hospital had already flown out to Trichy to harvest the donor liver.

High potential for disaster

The surgeons had already explained the procedure to us in detail. I knew that the surgery, which would take about 12 hours, was an extremely complex procedure. The risks were many: bile duct complications, bleeding, blood clots, possible failure of the donated liver were only some of them.

The anaesthesiologists would keep a close eye on Siddharth, which would allow his surgeons to work unhindered. The timing was another crucial factor. Removing the donor organ too early meant that it would be on ice for longer than the doctors felt was ideal. With unpredictable traffic conditions both in Chennai and Trichy and the very real risk of missing flights, time management was going to be key.

Planning and team work pays off

With meticulous planning and co-ordination between both teams, and a little bit of luck, all went well. I was later told that the donor's age, the organ's steoatis (amount of fat in the tissue), medical condition and size, and the calculated ischemia time met the gold standard that the team adhered to. The liver was declared suitable and harvested. However, the doctors had their share of anxious moments at the Trichy airport as they struggled to convince the CISF staff of the necessity of carrying the liver protected by perfusion fluids in the aircraft cabin!

Once the home team received word that the liver was on its way, they wheeled Siddharth into surgery to remove his diseased liver and prep him to receive the new one.

Case Study

A nail biting wait

The surgery took 8 long hours. Our surgeons told us that it went perfectly. Post surgery, Siddharth was monitored closely in the state-of-the-art ICU to ensure that there were no complications.

From bland food to Biriyani in two weeks!

A week later, Siddharth was moved from the ICU to a private room although his visitors were strictly

restricted. His doctors were very pleased with his progress. He had weighed 100 kgs prior to surgery, because of fluid retention.

It had now reduced to 78 kgs, indicating that his new liver was working well. Even better, he no longer had to watch what he ate.

Care beyond the call of duty

From our first visit to MIOT International, we were impressed with both the state-of-the-art facilities and the thoroughness of the doctors. They were completely transparent with us about Siddharth's condition, the surgery and its risks, so we were prepared for the challenges that we would face. Their insistence on the perfect liver for my husband is testament to the high quality of care he received. At the end of the day, the success of the surgery also depended on the co-ordination of logistics and timing. The detailed planning, execution and synchronisation of the entire operation, which involved so many people and different organisations leaves me awestruck every time I think of it.

MIOT took care of everything, leaving us to focus only on the surgery. We consider them and the army of nurses, who took such good care of him, our family.

A rosy future

Three months after his life saving surgery, Siddharth is making up for missing out on his favourite foods and is considering returning to work part time to begin with. Yes, he has had to make significant changes in his lifestyle but he is committed to his recovery.

As for us, we can barely contain our delight. Thanks to MIOT, he has had a second shot at life!

Case Study

Coming together to beat the odds

His queasy stomach turned out to be hiding much more… And his prognosis looked grim.

When a massive pancreatic tumour turned Manoj's world upside down, the question was: could it be put it right again?

47-year old Manoj beamed with happiness as he watched his little girls perform on stage at their school's Annual Day. Two months earlier, this had seemed unlikely because he had just been diagnosed with a massive, 'inoperable' tumour in his abdomen.

Innocuous symptoms, no warning

"He had no warning whatsoever. He woke up with an uneasy feeling in his stomach one morning. Ignoring it, he went about his usual routine and was soon working on the stack of files on his desk at the office. Coffee and later, soda, did nothing to ease his discomfort. By afternoon, he could not work anymore. His upper abdomen was painful and he was quite dizzy. Calling it quits for the day, he headed home.

A diagnosis that blindsided him

By evening, Manoj was feeling worse than ever. His worried wife took him to the local doctor who prescribed antacids and rest. Neither did any good. The next day, the couple went to a corporate hospital close by, where he was admitted immediately for evaluation. After a series of blood tests and a CT scan, the doctors had made a diagnosis. He had a large tumour that had penetrated multiple organs: his duodenum, pancreas, gall bladder, liver, large intestine and possibly blood vessels of the right kidney. The surgeon at the hospital told the distraught couple that the hospital did not have the facilities to perform such a risky and complex surgery. They referred Manoj to us."

"Manoj has always been health conscious. So nothing had prepared us for his diagnosis. However, his doctors explained that this is how pancreatic disease works - its sneaks up on its victims. They were very transparent in explaining not only how serious Manoj's tumour was but also why we had to get him into surgery right away..."

Priyadarshini
Manoj's wife

A re-evaluation and a game plan

"We reviewed Manoj's blood work results and scans and discussed the case at length. We then told the worried couple that while it was going to be complicated, we would definitely attempt to remove the entire tumour. Preparing for the surgery, we assessed Manoj to ensure that he would be able to withstand it. We also made arrangements for an unusual procedure called an 'auto transplantation of the kidneys*' in case the tumour had penetrated the blood vessels in his kidneys. Our preparations complete, we were ready to tackle Manoj's tumour."

"I was very emotional initially but my doctors were very patient and positive about their treatment plan for me. In the end, their confidence reassured me. I told my daughters I would soon see them at home! It all happened so fast - eight days from diagnosis to the operating table!"

Manoj

Many expert hands for a complex procedure

"The surgery took a little over five hours. In a Whipple's procedure, our team of surgeons, comprising HPB surgeons, nephrologists, GI surgeons, anaestheologists and others, painstakingly removed the tumour which extended from the head of Manoj's pancreas, across the large intestine, gall bladder and a part of his adrenal gland and liver. We were also able to free it from his kidney's blood vessels without having to resort to the auto transplantation.

Good news at last

Post surgery, Manoj stayed in the ICU for a week and was monitored closely for several days. He responded well to the special nutrition and the intensive rehabilitation received under the guidance of expert nurses and intensivists. Even better, his biopsy results came back with good news. They confirmed that the tumour had been removed completely; also, it was a gastrointestinal stromal tumour (GIST) which was not likely to recur.

Back at home and life goes on…

We discharged Manoj 10 days after his surgery. Our medical oncologist then stepped in to oversee his chemotherapy. For the next year, Manoj will take a special chemotherapy drug at home without having to visit a hospital for periodic infusions.

Almost three months after surgery, Manoj is doing well and is back at work! Life is once again back to normal!"

** This procedure would involve removing Manoj's kidney from his body if necessary, infusing it in an ice cold solution to keep it alive, and attaching the new blood vessels surgically on to the kidney while it was outside the body. Then, the kidney would be placed back in his body.*

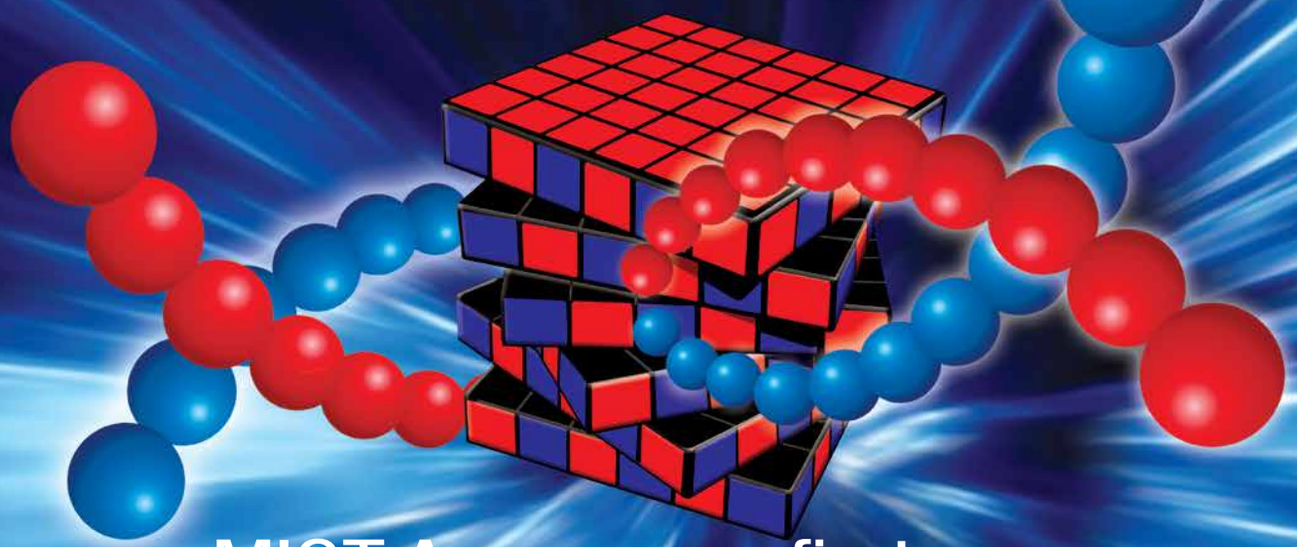
Pancreatic Transplantation? Organs grown in the lab? What does the future hold?

Pancreatic transplantation continues to be a challenge at the present time, the risks and complications of the procedure outweighing its benefits. However, around the world, research continues in the area. The goal: to offer patients with Type I Diabetes, who have also developed renal failure, a permanent solution to the disease in the form of a kidney-pancreas transplant.

World over, including at the MIOT Institute of Research, researchers are also actively studying stem cell biology to create a technique to isolate, purify and concentrate islet cells from pancreatic tissue of donors. The technique has the potential to concentrate enough islet cells to cure a person with Diabetes Type I from a single donor pancreas. Success could very well mean a cure for diabetes without a complex surgery.

Another exciting area for research is the potential of stem cells to grow into organs. We still have a long way to go, but it is a first step in the right direction.

The endless wait for the **'Perfect Match'** is finally over



MIOT Announces first ever

Haplo-identical

Bone Marrow Transplant in India

*Today patients across India, afflicted with blood cancers, thalassemia, aplastic anaemia and other malignant blood disorders, who have to undergo a bone marrow transplant are invariably searching in despair for a **100%** matching donor. They wake up every morning to an uncertain future. With the first ever **Haplo-identical transplant**, MIOT International offers over 40,000 such patients and their loved ones a definite solution which could give them a second chance at life.*

No more waiting

With a Haplo-identical transplant you can have a donor who is only a **50% match** and still have the same results as a perfectly matched transplant. This means, you could find your donor right at home - as your parents, siblings or children are **atleast a 50% match.** It is also the most economical of transplants.

Specialized Care - end to end

With any bone marrow transplant, you need specialized care - before, after and during the treatment period. As your immunity levels are at its lowest in a transplant, advanced treatment facilities, expert doctors and nursing staff and high standards in infection control are essential at every stage. Our team of specialists with considerable experience abroad, supported by cutting-edge facilities, take complete care of you at the MIOT Institute of Haematology, Haemato-oncology & Bone Marrow Transplant.

World-class Care

We are one of a few elite centres in the world today to perform all types of bone marrow transplants - **Autologous, Allogeneic, Umbilical cord blood and the Haplo-identical** to global standards. The Institute also offers diagnosis and treatment for the entire gamut of blood diseases and disorders - general and specialized.

Inspired by our patients

'Putting patients first' is a way of life at MIOT. We constantly make every effort to bring in the latest technologies and talent, integrate treatments and provide you with a positive, healing environment. Once again, your needs have motivated us to reach out with the path breaking procedure, the Haplo-identical Bone Marrow Transplant and this world-class Institute.

Thank you for inspiring us to raise the bar, yet again.

MIOT International

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