LTSI LIVER TRANSPLANTATION SOCIETY OF INDIA

# LIVER REPORT

Issue 8
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**Guest Editor**
Dr Shruthi Reddy

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# EDITOR'S NOTE

*Dear friends,*

*Happy new year 2024 to you all and many congratulations to the new LTSI leadership- Prof Mohamed Rela and Dr Ramdip Ray who were elected unopposed as the President and Vice-President of the LTSI.*

*As the guest editor of this issue, I am happy to present the 8th issue of LiveReport. Liver transplantation in India is making great progresses every passing year- the overall number of transplants are increasing, significant innovations are made and two international meetings were hosted last year. This year, the LTSI mid-term meeting is being organised in association with the International Liver Symposium by Dr Soin and team in Gurugram from the 8th to 10th March. The meeting has an array of national and international experts and would be something for us to look forward to.*

*For this issue, we have interviewed Dr Liz Pomfret, a prominent name in liver transplantation and a new age leader. It was a stimulating conversation we had and the transcript presents a preview of her journey and vision.*

*The journal club is presented in a refreshed format. Instead of focussing on a single paper, we are providing links to a few articles of interest in each area and a brief write-up on one article. The same format will be continued in the future issues to enable seminal publications to be highlighted to the readers. We also have interesting reads on gut microbiota in liver disease and biological immunosuppression agents.*

*The KGMU team has provided us their take on sustaining a liver transplant programme in a public sector hospital. The AILBS team who have the largest experience in pure laparoscopic donor hepatectomy in India have shared their technique under the 'Tricks of the Trade' section. Proceedings of the annual LTSI conference and the first LTSI fellow's symposium are presented and an avid trekker from our LTSI community transports us to Everest Base Camp through his article, for us to experience the thrill from our OTs/ clinics.*

*I thank the LTSI editorial board for the opportunity to edit this issue and my special thanks to Drs Mettu S Reddy, N Murugan and Sujoy Pal for co-editing and guiding me.*

*Best wishes*

*Shruthi H S Reddy*

*With Drs Mettu S Reddy, N Murugan and Sujoy Pal*

## UP CLOSE AND PERSONAL

### *An interview with Prof Liz Pomfret- the new age leader*

**Elizabeth Anne Pomfret, M.D., Ph.D., F.A.C.S**
*President, American Society of Transplant Surgeons*
*Past President, International Liver Transplantation Society*
*Professor of Surgery*
*Chief, Division of Transplant Surgery*
*Igal Kam, MD Endowed Chair in Transplantation Surgery*
*Executive Director, Colorado Center for Transplantation Care, Research and Education (CCTCARE)*
*University of Colorado Anschutz Medical Campus*

*Interviewed by **Dr Shruthi Reddy** (SR), Consultant HPB/ Liver Transplant Surgeon, Sakra World Hospital, Bangalore and **Dr Gomathy Narasimhan** (GN), Senior Consultant Liver and Renal Transplant Surgeon, Rela Institute and Medical centre, Chennai.*

*SR- We would like to know a little about your background. What was your medical training like? Were there any specific events which brought you into liver transplantation?*

LP- I grew up in New Jersey and went to college in Boston. When I was still in college, I volunteered at the Dana Farber Cancer Institute and that was my first introduction to anything formal in medicine. I was **working with Dr. Karen Antman, a medical oncologist** who is currently the Provost and Dean of Boston University School of Medicine. She involved me in projects studying sarcoma and mesothelioma. She taught me how to formulate a research question, design a study, collect data, write an abstract and manuscript. I was invited to give an oral presentation of that research at a national cancer meeting the day after I graduated from college! Subsequently, I went to Boston University School of Medicine where I completed an MD/PhD degree. My PhD research investigated the role of phosphatidylcholine in mitigating fatty liver and cirrhosis. During my time in the lab, I received several grants including one from the American Liver Foundation and that introduced me to liver diseases as a clinical specialty.

I loved surgery in medical school during my clinical rotations. My husband Jim (Dr James Pomposelli, Surgical director of Abdominal Transplantation at the University of Colorado) whom I had met in high school and I were in the same medical school. He always knew he wanted to be a surgeon. I loved surgery but was worried that two of us couldn't both be surgeons and manage a married life together. So, I spent a lot of time in clinical rotations trying to see if I could learn to love other medical specialities with interventional procedures like cardiology or gastroenterology. Unfortunately, none of

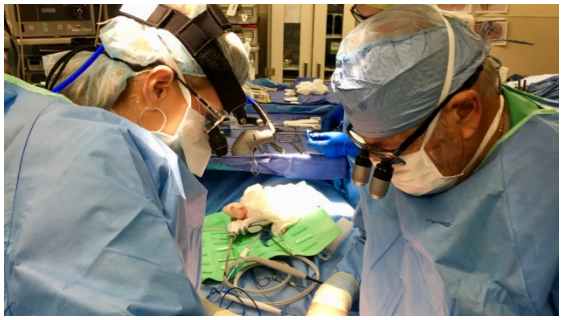
them excited me like surgery. One day I told Jim that if I end up settling for one of the medical specialities, I would likely end up hating him. He appropriately said that I should do what I love and everything else would work out…and he was right! We ended up applying for a match where we could both apply for the same residency program. It was unusual at that time but it was practical for us as we could then manage our personal lives better. It was 1990, this was my first real introduction to gender bias in medicine- it was like a case-control experiment.

*Drs Liz and Jim, then..*

We both were MD/PhDs, both top of our class, the nearly all-male residency selection committees fully understood what Jim was trying to achieve in terms of wanting a 5-year categorical general surgery residency spot but seemed to have difficulty understanding what it was that I was looking for. I was repeatedly asked 'What exactly are you trying to do?'. I found myself thinking: "What am I trying to do?! Well, the same thing my husband is trying to do and you didn't seem to have difficulty understanding what he was trying to do--did you?!" More often than not, we would end the day in the Chief of Surgery's office addressing some version of the following: "I'm not sure I understand this "couples thing". 'Jim, I understand you. You can go straight through. Liz, I'm still trying to figure out what you want. Why don't you do the first 2 or 3 years then spend some time in the lab and then you can finish up.": I already had a PhD and had made it clear that I did not want to spend another 2-3 years in the lab. It was very strange from my perspective.

*And now.*

Eventually we ended up going to the Harvard program at New England Deaconess Hospital in Boston which was a wonderful experience. We were **training with Dr. Roger Jenkins who was one of the original people trained by Dr. Thomas Starzl**. Roger is an amazingly gifted hepatobiliary and transplant surgeon who started liver transplant in Boston and New



*Operating with Dr Roger Jenkins*

England. I was actually exposed to him during my medical school rotations when I was asked if I would like to go on an organ procurement with Dr. Jenkins. I barely knew who Roger was. We flew to the donor hospital and where he handed me a 'How to' manual that he had written and fell asleep on the jet. I remember coming back home and telling my mother that it was amazing but I would never do that for my life long career!. During residency, Jim and I both really loved that rotation and we went through the same dilemma again as we felt it would be too crazy for both of us to be in transplantation. I again tried out plastic and reconstructive surgery, colorectal, cardiac but transplantation was my ultimate love. We had a conversation during one of our vacations and decided that I would go into fellowship training first while he took a job doing general surgery and working in the surgical ICU.

After training I went on staff at the Deaconess. LDLT was just starting to gain worldwide acceptance and I wanted to start LDLT in Boston. I spent time with Dr. Christoph Broelsch in Hamburg, Germany. When I came back, I started on staff at the Deaconess in August 1998 and invited Dr. Christoph Broelsch and Dr. Max Malago to come to Boston to help us do our first 2 adult-to-adult LDLT cases in December 1998. Our entire team of 40 moved to **Lahey Clinic** the following year. Over the subsequent years, Jim and **I built the largest LDLT program in the US.** Later in 2016, I was recruited into the University of Colorado, the place where liver transplant originated, to take over the transplant program when Dr. Igal Kam retired and to build and integrated transplant institute.

*GN- Have you been a leader right from your school days or did you take special interest to build yourself into a leader?*

LP- I am the oldest in my family and as the oldest you sort of are the leader in the family. I have always had strong opinions, so I tend to end up in a leader type of a position. **But you have to build leadership skills even if you tend to be a leader type of a person.** There is a big difference between being a junior attending and being a leader and beyond; the skills that you need and the skillset you have to have to get you through surgical training are not necessarily the skillset needed to become a good leader. During training you have to get things done no matter how difficult the task, no matter how tired or sick you might feel. You just learn how to bulldoze through regardless of whether others might find your style "aggressive", "callous" or lacking "sensitivity". You simply don't have time for nonsense and stupidity. As a leader you can't be like that, you have to understand that people need to "buy into your vision" and that doesn't happen by hitting people over the head with your vision.

A leader realizes that everyone has a different style; some people need just the facts while others need much more hand holding. It's important for the leader to listen to everyone's opinion, respect everyone's feelings, be understanding, fair and compassionate, while still being able to make the final decision. Women often have more difficulty with how they are perceived. A no-nonsense, vocal, highly driven woman leader can be seen as "too aggressive and difficulty to work with". A more soft spoken, accomplished woman is

often described as "She is a really nice person but she can't lead". When you are negotiating as a women leader, you have to be very careful because there's a very fine line between being seen as a good, tough negotiator versus being seen as a pain in the neck. So, there's a fine balance between being cordial, respectful, humorous and at the same time letting people know that you mean business. I don't know of any woman who hasn't got burnt somewhere along the line with that.


*Recently awarded the 'Most Clinically Innovative Leader' by UC Health*

*SR- How difficult was it for you to get the recognition of a leader surpassing bureaucracies or systemic bias- not just as a program director but your roles as ASTS president, ILTS president etc, where you need support from a larger audience?*

LP- First and foremost, for people to respect you and take you seriously, you have to have the goods. You have to be a good surgeon and people have to be able to see that. They have to be able to say 'She's a great surgeon, you can't argue that'. You have to know what you are talking about. So, I never go into any discussion or negotiation without knowing all the facts, all the potential weaknesses of what I am trying to argue for or achieve. I always go in fully prepared. I always surround myself with people with all different points of view because I want to hear all the potential downfalls of what I am proposing. That's the only way you can appropriately prepare for something, by having arrows shot at you from all the different directions. And you have to be fair- absolutely truthful, honest and fair. People might not like what you say, but they will accept what you are saying if they know that you are fair and honest. You have to be absolutely hard lined about honesty and transparency, especially if you are holding a position like president of ASTS or chief of transplant centre. You must hold everyone to the same standards, no special deals for anybody. **In my opinion, the most influential leaders are honest, transparent and follow through with their commitments. They say what they mean, do what they say and they don't ask others to do things that they do not expect of themselves.**

*GN- LT itself has bloomed during these years from a restricted to a global specialty in terms of regions and number of programs. How do you see this growth in terms of quantity vs quality and regulations?*

LP- The growth of transplantation around the globe is extraordinary. Liver transplantation is no longer a treatment only available in wealthy, first world nations and that is a wonderful reality! I am concerned, especially with the exponential growth of LDLT, about the training and certification of such a complex procedure. With programs beginning all over the world, some in places with outstanding surgical talent, good hospital resources in terms of anaesthesia, ICU, blood bank, infectious disease and other critical medical physician expertise and other program's not so much. Who is paying

attention to the qualifications of the team starting the program, who is determining if the training of the various team members is appropriate, who is assessing the patient outcomes and calling out programs that maybe are not qualified to be doing LDLT? It bothers me that in the US, there is no formal training pathway. If you are not in a programme where LDLT is done, you can go to Eastern countries to observe, scrub on 8 LDLT, come back and say you want to start your own program. I don't consider that to be appropriate training. I believe there may be such instances in other countries as well.

One of my **signature contributions to ASTS** as its president is launching the **first LDLT Masterclass** that will occur in April 2024 at the University of Colorado. It is a 3 day didactic and hands-on course with 20 faculty and 20 learners who must be at least 5 years or more out of training and looking to start a LDLT program at their institution. This is a novel hands-on course using perfused (arterial, systemic venous and portal venous) cadavers. The didactic portion will include protocols, policies, order sets and lectures necessary for starting a LDLT program according to US regulations. The hands on portion will feature the donor operation in the morning followed by the recipient operation in the afternoon in the same cadaver. There will be 2 instructors and 2 learners per cadaver. Because of the massive media publicity following any liver donor death in the US, many programs that showed initial interest in LDLT didn't sustain their interest. Despite the recent uptick in LDLT in the US, it still comprises less than 7% of the total number of transplants performed.

*SR- The donor death- unfortunate but a reality world over. You faced criticism but you managed to come out of it and continue the good work. And you continue to be an advocate for the less popular areas in LT- LDLT, altruistic donations, transplant for extended oncological indications etc. It is necessary but not everyone would support it in the open. Can you please tell us your take on it?*

LP- **A donor death is unlike any other patients' deaths**. Any patient death is devastating and results in introspection and feelings of guilt that can consume the doctor. A donor death is that on steroids. Not just death but any serious adverse event in a living donor affects you in a profound manner. I have always been an advocate for donor safety and was lecturing and investigating how to ensure and improve donor safety long before the donor death occurred. What helped me to continue doing surgery and living donor surgery in particular was all the incredible support that poured in from the previous donors whom I had operated on earlier. Their letters telling me how important their donation was in their family etc, how the experience changed their lives and asking me not to stop was what gave me the confidence not to give up. I was horribly depressed for a very long time after the donor death. The combination of sadness, shame, guilt, fear, and disbelief that something like this could actually happen was overwhelming and suffocating. My mantra for many, many months was "Just get through today".

That was when I came to realize that our profession had failed us. Why do we as surgeons, especially transplant surgeons, who are dealing with life and death everyday have to hide how we feel? What is wrong with us that when a patient dies or some other terrible thing happens as a result of a medical error, we are supposed to just "shake it off". Obviously none of us start our day with the intention of harming a patient but despite our best attempts and in the best of hands, horrible things

can happen. We have spent our professional lives believing that self-vigilance and extraordinary diligence will prevent something like this from ever happening to "me". Yet that is a fantasy. How could we possibly care about and empathize with our patients if we didn't take care of our colleagues and ourselves?

To be a good doctor or even a good human being, empathy is essential. There are constant parallels drawn between aviation and surgery but the reality is, when Captain Sully landed a plane with 155 passengers in the Hudson river, no one said 'Ok, terrible thing, now let's get you dried up for your next flight'. When a policeman accidentally shoots an innocent bystander there is essentially a SWAT team that will whisk him away and put him on leave until the investigation concludes. Doctors do not have that comfort and protection. A surgeon has an awful complication intraoperatively and he or she often has a case to follow. At the very least, everyone expects them to show up able and ready to go tomorrow morning! We are not robots so how could be possibly feel nothing. That is why I chose to speak about my experience in public to my peers and why I started the ASTS Peer-to-Peer support program. The most effective thing that can happen to a surgeon that has been through a traumatic event is to speak with a peer who understands exactly what that surgeon is feeling and going through. This is not meant to be extensive psychiatric treatment, it is emotional first aid and hopefully enough for the surgeon to maintain a sense of balance. It is difficult to talk about situations that make you feel very vulnerable but I believe that in doing so it may give others hope that they are not alone. Many people from the transplant community have reached out and thanked me for being open about my experience. It's a learning experience for others as well, the gravity of LDLT is for everyone to see and learn.

About the other question, **innovation is important and it is the key to moving our field forward**. Many years ago the feasibility of transplantation was ridiculed. Similarly, in the not too distant future, I expect that extended oncological LTs, NRP, non-directed, anonymous donations etc. will become the standard of care with strict SOPs laid out. The future generation will look back and might think how primitive we were because their current paradigm will be xenotransplants or 3-D printing. Transplantation is a field that must continually push the envelope and continue to innovate in a responsible manner.

*With the team at Colorado*

*GN- Lifestyle disorders is emerging as the most common etiology for liver disease, world over. Do you think, the Transplant Community is focusing on any aspect of prevention and if not, do we have a responsibility to do that?*

LP- Yes, in US, during- and post-Covid, we are getting a lot of ALD cases for transplant in a much younger cohort of patients than we historically have seen. Due to the mental stress imposed by the pandemic, especially the isolation, many people began to drink much more often and in much larger quantities. Both men and women, especially those in their 30's and 40's had a dramatic increase in their alcohol use. We have seen a significant increase in women who found themselves

trying to do their own work from home while managing the majority of the household burdens, tutoring children in different grades, dealing with the anxiety of their children who no longer were able to see or play with friends and clearly had no "downtime" for themselves, turning to progressively more alcohol as a way to cope with their own anxiety and stress. Many of these men and women are presenting with MELD scores of 35+ in acute alcoholic liver failure in need of urgent transplant. We do transplants, yes, but there are not enough of resources in place for allied care like pre-transplant rehabilitation, psychiatric optimisation etc which in turn affects long term outcomes. This is something we are having to face day in and day out.

Childhood psychiatric illness too is at its maximum in the history of US. These kids have missed school for 2+ years and there has been an increase in alcoholism, drug addiction, depression and suicide due to this. One-fifth of our adolescents have psychiatric issues and we are looking at attrition of productivity in an entire generation.

The same would apply to **increase of MASH related transplants in India**, yes, we are looking at the problem once it has occurred. But as a **transplant/ hepatology community, we should work towards tackling these issues at the outset**. Involvement from societies will definitely help.

*GN- Almost all fields, across the board, realise that the Gen Z need a different approach and are adapting to make it mutually beneficial when dealing with that generation. What do you think has to be done in our field of transplant surgery to attract and accommodate them?*

LP- Several years ago, a large number of US transplant fellowship training positions were going unfilled. About 30-40% of positions remained open after the match and would ultimately fill with an International Medical Graduate. Unlimited work hours are not something that American surgical residents are used to and in general they are not attracted to positions like that. Combine long work hours with high stress, difficult work and it is no surprise why transplant surgery wasn't a favourite for many! The reality is that transplant surgery will never be a 9 to 5 job so you either accept that or find a different profession. Interestingly, in the last few years, we are getting many outstanding applicants, the really interested ones who are very smart, strong at research, many publications and great at academics. As with any generational shift, we have to accommodate to their requirements. They have grown up in a different culture and they are aware of their rights and feel free to speak up. They have also had a very different exposure growing up and their approach to issues is different. We need to be able to package our product differently and I have realised that an interactive format works much better for them. So, bottom line, **we need to change a bit and they need to adapt too**.

*SR- As someone from a nation where equal opportunity is promoted actively, do you think women play on a level ground in US or globally? And, on the contrary, do you believe in inclusion or EDI for the sake of it?*

LP- **A definite no.** There is no level ground globally and you can certainly argue whether the ground is level yet in the US…it is certainly better than what it was but I don't believe it is 100% equal yet.

EDI (equality, diversity, inclusion), yes, but the person in consideration still needs to be competent and qualified. He/she should be a good surgeon and it should be visible

to others. On my surgical faculty at the University of Colorado, I have 2 women attendings in addition to myself and 5 males. We have both male and female fellows. If I am faced with two equally qualified fellowship applicants (one male vs one female or one white vs one underrepresented minority) with similar great CVs, research etc, I would examine closely and be inclined towards hiring the underrepresented candidate as that person has likely put in a lot more effort to reach their current position.

*SR and GN- You have been to India on many occasions. What do you think of India and our people? What are the points in the field of LT that our countries can learn from each other?*

LP- I will respond to two aspects. First, to the women surgeons in India - The advantage US women surgeons have is that they have been in this longer, have overcome hurdles and we are very willing to partner with you to help negotiate obstacles. The good thing is that India is having a **steady increase in the number of women surgeons** as opposed to countries, some quite sophisticated and yet despite being world leaders in surgery and transplantation, there is hardly any woman surgeon in a leadership position. It is definitely not a good idea if we don't listen to the views of 50% of the population. Second, to the Transplant Community of India - with a large population like yours, the opportunity and magnitude of transplantation is tremendous. Given the number of transplants being performed, there is so much that can be learned from your experience. What we see currently is predominantly individual centre data, there is **huge opportunity for multi-centre trials and high impact publications from registry and outcome data**. With all the math backing that India is well known for, this should not be difficult, and you can actually teach the world.

*With Dr Jim and daughter Sophia in India*


*Antarctica vacation*

# SUSTAINING LIVER TRANSPLANTATION IN A PUBLIC SECTOR HOSPITAL: *"THE KGMU MODEL"*

**Dr. Utkarsh Srivastava**
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## Introduction

Department of Surgical Gastroenterology (SGE) at King George's Medical University, Lucknow (KGMU) was established in 2006. Since there was no medical gastroenterology (MGE) department back then, chronic liver disease (CLD) patients requiring medical care, including endoscopic services were managed by us. There was huge load of these patients without comprehensive care. Therefore, the requirement of liver transplantation (LT) as a cure for these patients was long realized. Additionally, there was a fully functional, high volume trauma centre and a huge potential for deceased donors' organ pool hitherto untapped.

On June 2nd, 2014, KGMU was recognized as non-transplant organ retrieval centre (NTORC). There was substantial support from administration including the then Vice-Chancellor mandating brain-death declaration. Subsequently, over next four years, retrieved organs were donated to various public sector hospitals as well as few private sector hospitals. Dr. Subhash Gupta, Director of Max Centre for Liver and Biliary Sciences (CLBS), New Delhi, was keen on establishing and training the surgeons at KGMU. His goal included providing affordable LT for patients of low socioeconomic status as a way of giving back to society. After a memorandum of understanding between the 2 centres, infrastructure was developed and manpower was trained at CLBS. On October 1st, 2018, the license for LT was obtained and first transplantation was performed at KGMU on May 14th, 2019 which was a live donor liver transplantation (LDLT).

Hospital staff carrying the liver on way to Delhi, in Lucknow on Wednesday. Express photo

*Initial retrievals as a NTORC*

THE TIMES OF INDIA

First liver transplant in KGMU's 100-year history

LUCKNOW: Achieving a major feat, doctors performed the first liver transplant in KGMU's over 100-year history on Thursday.

The patient is a 50-year-old man who was suffering from chronic liver disease. The 12-hour surgery is a big achievement for KGMU's surgical gastroenterology department which has conducted many organ retrievals till now.

The donor was patient's 48-year-old wife. The surgery began at 5.30am and ended at 5pm on Thursday, with both the recipient and the donor said to be stable. The transplant cost the patient around Rs 8 lakh, which is about one-tenth of the cost charged at private hospitals. The surgery was jointly performed by the liver transplant team of KGMU and doctors from Max hospital Saket, New Delhi.

*The first transplant*

*The KGMU team*

Till date, 31 LTs are done. Out of 31, 8 (25%) are deceased donor liver transplantations (DDLT) and the remaining LDLTs. ***At KGMU, the overall survival rate is 87.0% and 30-day post-transplantation mortality rate is 6.45%.*** The cause of early mortality in both patients was sepsis. After 16 months, one patient succumbed to graft failure caused by chronic rejection, while another patient passed away after 25 months, likely due to neurological complication of Tacrolimus. Before starting transplantation, 15 retrieved livers were allotted to various hospitals of Uttar Pradesh (UP) and Delhi.

**Our take on sustaining a LT programme in public sector**

Based on our experience, we propose these key strategies for program sustainability:

**1) Willpower and perseverance**

The key to success is having motivated individuals with strong willpower leading the program. Ideally, the lead person

should spearhead the effort, motivating everyone involved to step out of their comfort zones and actively engage. Initial inter-departmental and administrative challenges can be overcome through effective leadership and management skills, finding collective solutions as issues arise.

**2) Recruitment as well as continued training of the recruited faculties**

In public sector, the salary is much less than the private sector hospitals. Sustaining team interest becomes difficult over time in this demanding field due to lack of incentives. There is no tax rebate like that for professional fees or a system of variable pay as in private sector hospitals. In private sector hospitals, expertise is given preference over experience. Whereas in public sector, only experience is given preference even

though experience and expertise don't always go hand in hand.

Because of these factors, ***attrition rate is quite high*** in public sector hospitals. Therefore, continuous recruitment of faculties already trained in transplantation, as well as continuous training of the recruited faculties is very important. For the same, KGMU has a tie up with CLBS and by rotation, faculties are being sent to CLBS for 3 months.

**3) Recruitment, training and retention of trained paramedics**

The attrition rate of paramedics is nearly nil in public sector hospitals because of good salary as well as fixed working hours.

Two specific set of problems were identified:

- Firstly, with the *fixed working hours, there will be problems that arise due to shift change.* To overcome this problem, in KGMU, we have recruited more staff and trained them so that trained staff is always available on the job.
- Secondly, *transfer of trained staff.* At KGMU, this problem is handled by the team leader and the administrators. The senior members of the team make sure that all the staff are satisfied and small disputes are handled carefully. It is ensured that the trained staff don't demand for transfer as well as they are not transferred. Even if they get promoted, they are assimilated in the department resulting in proper training of the junior staff.

**4) Give due importance to the subsidiary departments (Team work)**

Transplantation success relies on collaborative efforts across multiple departments. In KGMU, we conduct regular inter-departmental educational activities to encourage participation.

For example, through collaboration with pathology and microbiology, we've developed a cost-effective package for recipient and donor evaluation. After surgery, labs for both follow a predefined marking pattern and undergo swift testing, preferably immediately after external quality control sample testing for valid results, expediting decision-making. To facilitate quick communication, a dedicated WhatsApp group includes designated faculties monitoring bacteriology, virology, and mycology. The head of the department oversees the group, ensuring prompt reporting of positive cultures and viral test results. In the event of an outbreak, an analysis is promptly conducted.

During pre-transplant meetings, active interaction occurs between MGE, Anaesthetists, and the SGE team. Post-transplant follow-ups are streamlined by coordinating common days for patients to meet both SGE and MGE.

**5) Principle of "Bare Minimum"**

In contrast to the corporate sector, the public sector programme runs on the principle of "bare minimum". There is always scarcity of the resources especially in UP, the most populous state of India. There are often compromises in the infrastructure as well as armamentarium but that is judiciously overcome. However, there must not be any compromise which can affect the outcome of the programme. As long as outcome is comparable to good centres, some compromise in

infrastructure and armamentarium are acceptable. To ensure this we were selective in our initial patients for transplantation.

**6) Maintaining good outcome of the programme**

Program sustainability depends on good results. Careful case selection is crucial; critically ill patients like acute on chronic liver failure and paediatric cases should be avoided initially, until the system has matured. DDLTs should be preferred initially, with a later transition to LDLTs.

**7) Smooth follow-up of the patients and post-op support**

For comprehensive pre-transplant work-up and post-transplant support, a single faculty member has been selected from various specialties. This ensures clear communication and rapid execution of consultations, minimizing confusion among team members.

A simple notebook system is used for data maintenance, with patients bringing it for each follow-up, containing vital labs and information. Transplant coordinators' contact numbers and department closed user group numbers are provided for scheduling consultations, minimizing waiting times. Patients are advised to stay nearby for 2 to 3 months post-transplant for frequent follow-ups to allow stabilization of immunosuppressants before returning to areas with limited medical facilities.

**8) Continuing Medical Educations (CMEs): for referral of patients to the department**

The medical gastroenterologists as well as general physicians have to understand that only curable treatment option for CLD patients is LT. It's also important to understand that the result of LT will be better in a relatively stable patient in comparison to a very sick patient. A patient who fulfils transplant criteria and is continued on medical management will spend more money than what is required for LT and still succumb to the illness. Through periodic CMEs, we constantly educate the medical gastroenterologists as well as general physicians to refer the CLD patients to us early, thus also creating awareness that LT is offered at KGMU with good results.


*Outreach CME organised by KGMU*

**9) Deceased donor awareness programmes**

The ideal transplantation program relies on deceased donors, supplemented by live donors for emergencies. Despite low brain-dead donation rates in UP, efforts are underway at KGMU to raise awareness through camps, school visits, and family involvement. The university actively promotes organ donation with banners, videos, and felicitations for deceased donors' families, positioning KGMU as the sole centre generating organs from brain-dead patients in UP.

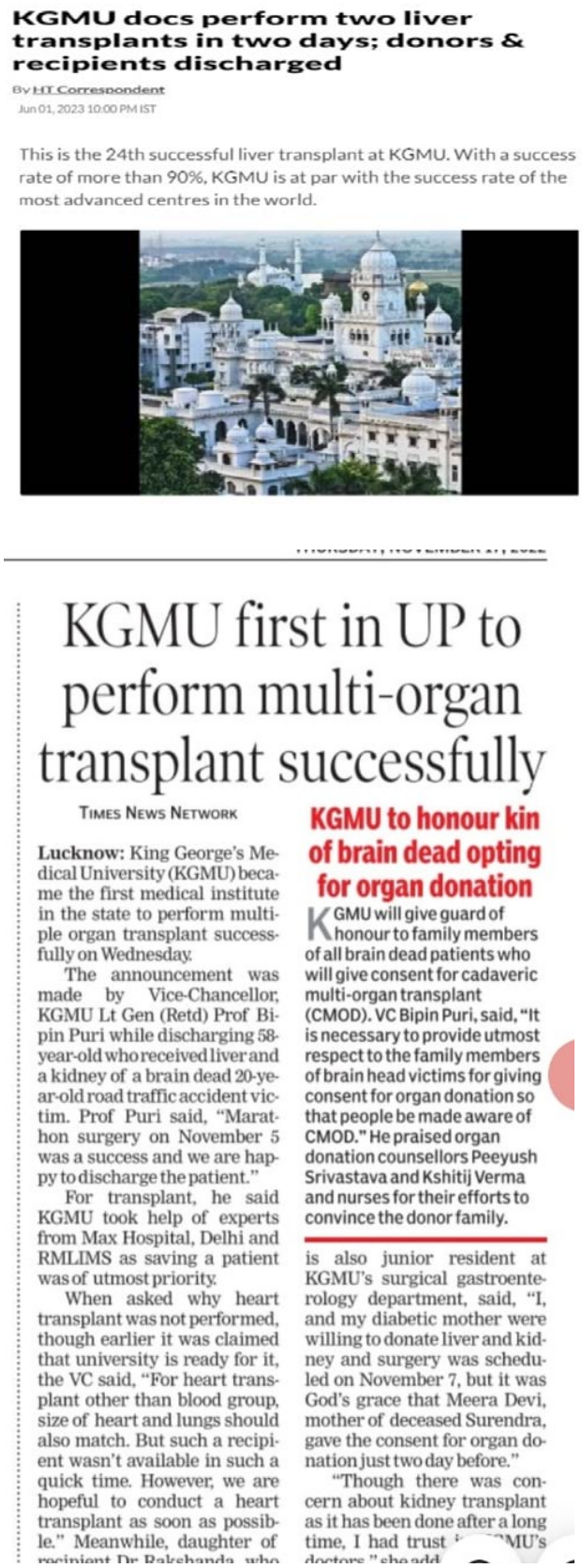
**10) Maintenance of the equipment & instruments**

We send the notifications to biomedical department, on regular basis to ensure their proper maintenance. If, due to unforeseen reason, some problem arises we take help from other surgical departments. We also maintain a departmental fund. This helps in urgent situations where maintenance is required and is not possible through proper channel.

**11) Financial help for very poor patients for LT & post-LT**

If patients are very poor, we provide an estimate and refer them for help through ***CM and PM funds***. We have done few transplantations where the cost of transplantation was zero for the patient. ***"Asadhya Rog Scheme"*** provides post-transplant immunosuppressants free of cost. We also liaise with various NGOs for support.

Our unit is gradually maturing. During COVID pandemic, only one transplantation was performed. The programme regained pace after pandemic. UP's first multi-organ transplantation (simultaneous liver and kidney transplantation), was performed in KGMU on November 16th, 2022. We are continuously evolving to provide better and inexpensive LT facility to economically deprived section. We also express our gratitude to Max CLBS, New Delhi team for helping us in this noble project.



**KGMU docs perform two liver transplants in two days; donors & recipients discharged**

By HT Correspondent
Jun 01, 2023 10:00 PM IST

This is the 24th successful liver transplant at KGMU. With a success rate of more than 90%, KGMU is at par with the success rate of the most advanced centres in the world.

# KGMU first in UP to perform multi-organ transplant successfully

TIMES NEWS NETWORK

**Lucknow:** King George's Medical University (KGMU) became the first medical institute in the state to perform multiple organ transplant successfully on Wednesday.

The announcement was made by Vice-Chancellor, KGMU Lt Gen (Retd) Prof Bipin Puri while discharging 58-year-old who received liver and a kidney of a brain dead 20-year-old road traffic accident victim. Prof Puri said, "Marathon surgery on November 5 was a success and we are happy to discharge the patient."

For transplant, he said KGMU took help of experts from Max Hospital, Delhi and RMLIMS as saving a patient was of utmost priority.

When asked why heart transplant was not performed, though earlier it was claimed that university is ready for it, the VC said, "For heart transplant other than blood group, size of heart and lungs should also match. But such a recipient wasn't available in such a quick time. However, we are hopeful to conduct a heart transplant as soon as possible." Meanwhile, daughter of recipient Dr Rakshanda, who

**KGMU to honour kin of brain dead opting for organ donation**

KGMU will give guard of honour to family members of all brain dead patients who will give consent for cadaveric multi-organ transplant (CMOD). VC Bipin Puri, said, "It is necessary to provide utmost respect to the family members of brain head victims for giving consent for organ donation so that people be made aware of CMOD." He praised organ donation counsellors Peeyush Srivastava and Kshitij Verma and nurses for their efforts to convince the donor family.

is also junior resident at KGMU's surgical gastroenterology department, said, "I, and my diabetic mother were willing to donate liver and kidney and surgery was scheduled on November 7, but it was God's grace that Meera Devi, mother of deceased Surendra, gave the consent for organ donation just two day before."

"Though there was concern about kidney transplant as it has been done after a long time, I had trust in KGMU's doctors," she add

*News coverages of KGMU transplants*

# THE SYMBIOTIC SYMPHONY: GUT MICROBIOME AND ITS INFLUENCE ON LIVER HEALTH

**Dr Sumana K R**
Senior consultant HPB and liver transplant surgeon
AIG hospitals, Hyderabad

The holobiont concept sheds light on the symbiotic relationship between prokaryotic and eukaryotic organisms within a multicellular organism, aiding in our understanding of human evolution. In the human digestive system, a diverse and intricate microbial composition exists, crucial for maintaining human health. Our gut harbors approximately 1,000 bacterial species, possessing a gene count 100 times greater than the human genome (1). Referred to as the gut microbiome, these microbes act as a hidden metabolic "organ", significantly influencing various aspects of human health, such as metabolism, nutrition, immune function, and physiology. Co-evolving with humans (2), the composition of our gut microbiome can undergo alterations, which can have profound impacts, both positive and negative, on human health.

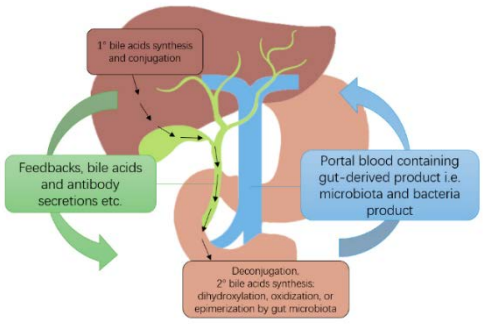
**The Significance of the Gut Microbiome in Achieving Symbiotic Harmony**

In recent years, numerous studies have emphasized the connection between the gut microbiota and various diseases. These findings underscore the importance of investigating the gut microbiota and its implications for personalised healthcare strategies in the future. Moreover, they suggest that directly manipulating the gut microbiota could yield considerable benefits for the host (3).

***Microbiome – Gut - Liver - Brain axis***

In recent years, the gut-liver interaction has gained recognition due to its relevance to liver disease. The gut and liver communicate through the portal vein, biliary tract, and systemic circulation. Intestinal products, including metabolites and microbial patterns, reach the liver via the portal vein, influencing its function. Conversely, the liver releases bile salts and antimicrobial molecules through the biliary tract to maintain a balanced gut microbiota. Gut dysbiosis can lead to metabolic disorders in the liver and subsequent liver damage. For example, imbalance in gut microbiota reduces the synthesis of secondary bile acids resulting in bile salt retention, bacterial translocation and overgrowth, ultimately causing liver disease. Liver disease compromises the liver's ability to control bacterial growth and eliminate harmful by-products. Studies indicate a strong

association between liver damage and the severity of gut dysbiosis (4). Considering the gut-liver interaction is vital in understanding the development and occurrence of diseases, particularly in liver diseases like hepatic encephalopathy, which serves as a typical model of microbiota-gut-liver-brain axis disease.




***Microbiota - Gut - Liver - Brain axis and NAFLD***

NAFLD is generally considered to be the liver manifestation of metabolic syndrome. Currently, the understanding of the pathogenesis of NAFLD is still incomplete. It is believed to be the result of a combination of multiple damaging factors, including insulin resistance, oxidative stress, lipid metabolism alteration, inflammatory cytokines liberation, endoplasmic reticulum stress, gut dysbiosis or gut-liver axis activation, genetic and epigenetic factors. Studies have confirmed that the microbiota-gut-liver-brain axis plays an important regulatory role in the pathogenesis of NAFL/NASH, and the main participants are the gut microbiota, its bacterial products, and the intestinal barrier (5). Studies have also shown that severity of NAFLD is related to dysbiosis and that the disruption of the intestinal epithelial barrier and gut vascular barrier (GVB) are early events in the onset of NASH.

***Microbiota – Gut – Liver - Brain axis and Alcohol Liver Disease***

Alcohol-related liver disease (ALD) is a growing concern among young people, leading to increased hospitalizations and economic burden. Emerging evidence suggests that ALD is associated with changes in gut microbiota, leading to dysfunction in the gut-liver axis. The microbiota's role in bile acid metabolism and its impact on alcohol-related damage, including cirrhosis and alcoholic hepatitis, has been observed. Additionally, alterations in the gut microbiota can affect brain function and contribute to the interaction between gut microbiota and alcohol addiction. It also plays a role in the development of alcohol-related psychotic symptoms and increases the risk of serious alcohol-related illnesses. Research has indicated that alcohol-induced toxicity to brain tissue, neuroinflammation, and changes in the gut microbiota may contribute to hepatic encephalopathy associated with alcohol use. Thus, understanding the influence of gut microbiota and the gut-brain axis is crucial for the occurrence and progression of ALD, providing opportunities for new treatment approaches.

***Microbiota -Gut Liver -Brain Axis and Cirrhosis and HE***

Bacterial translocation and its products, such as endotoxin, are important in the development of conditions like hepatic encephalopathy (HE) and spontaneous bacterial peritonitis in cirrhosis patients.

Research shows that the gut microbiota undergoes changes as cirrhosis progresses, leading to dysbiosis. And this gut dysbiosis is associated with a diverse range of circulating bacteria in cirrhosis patients. Additionally, certain types of gut microbes are associated with alterations in neurons and astrocytes, contributing to brain dysfunction in cirrhosis. This emphasizes the close relationship between changes in the microbiota-gut-liver-brain axis and the progression of cirrhosis. HE, a model of gut-liver-brain axis disease, causes neurological abnormalities due to toxic metabolites like ammonia and endotoxin, as well as impaired liver function. Inflammation, leaky gut, bacterial translocation and small intestinal bacterial overgrowth are also contributors to HE's development. Understanding these factors is crucial for managing cirrhosis complications.

In conclusion, the microbiota and the intricate interplay within the gut-liver-brain axis demonstrate a remarkable symbiotic relationship. This symphony of interactions profoundly influences our health. By unraveling the mechanisms and exploring treatment strategies, we can advance disease management for conditions such as NAFLD, ALD, cirrhosis, and HE. However, further clinical research is necessary to evaluate efficacy, safety and patient tolerability. The pursuit of understanding these interactions holds great promise for personalised, targeted therapies and optimising health. By cultivating a deep understanding of the microbiota-gut-liver-brain axis, we can orchestrate a harmonious relationship that revolutionises disease management and fosters optimal health.

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# TRICKS OF THE TRADE

## PURE LAPAROSCOPIC DONOR HEPATECTOMY: *THE AILBS EXPERIENCE*

Dr Kausar Makki
Senior consultant in HPB and liver transplantation
AILBS, Fortis hospitals, Delhi NCR

Pure Laparoscopic Donor Hepatectomy (PLDH) is a relatively new technique in the field of Living Donor Liver Transplantation. Recent experience and published studies have proven its feasibility and benefits for the living donor.

Learning Curve of PLDH is very steep because of various reasons. The AILBS team envisioned on embarking this journey in 2018 after we started believing in the benefits of the procedure. We visited a high-volume centre doing this procedure for a week.

We were able to complete our first PLDH in 2019 *(Figure 1)*. As we moved ahead in our journey towards PLDH as standard procedure for donors, we came across many hurdles. We devised our own ways to cross these hurdles to the best of our capabilities. Presently we are doing 6-8 cases of PLDH every month (constituting about 30% of our Transplant cases) with whole team trained to do the procedure.

Every new centre embarking on this journey should pay attention to four stages and hurdles of learning new procedure:

I. **Unconscious Incompetence** - stage to mentally prepare the team for learning a new procedure

- Mentally accept and believe in the benefits of the procedure
- Do several departmental meetings and literature search for planning
- Visit centres of expertise willing to positively share their experience- only key team members driving the program are required to visit – 2 Surgeons/ Anaesthetist/ Technician and Scrub nurse.
- Procure all required protocols, instruments and equipment's after visiting experienced centres
- Informed consent from donor and family

*In a first, part of liver removed laparoscopically*

In a what is being claimed as a first in India, doctors at a Delhi hospital laparoscopically removed a part of the liver of a 23-year-old Iraqi woman, who donated the part to her ailing son after a 10-hour procedure.

The procedure hepatectomy, a surgical resection, is usually done in traditional open surgery.

The woman's two-and-a-half-year-old son was suffering from a liver disease and as his condition deteriorated, she voluntarily donated a part of her liver.

In India, this is possibly the first case in which such minimally invasive technical procedure has been conducted for a liver transplant, the hospital said.

Image for representation

The recipient had a condition known as 'glycogen storage disease', a precursor to advanced liver disease and liver cirrhosis. The mother offered to donate a part of her liver and after a thorough examination a graft was retrieved from the left lateral segment of the donor.

The entire procedure took 10 hours, the hospital said.

While using minimally invasive surgical techniques to conduct the surgery posed several difficulties, it also presented the patient with several advantages such as lesser pain, invisible scars. The recovery was smooth and uneventful with a minimum hospital stay for the donor, Vivek Vij, director of liver transplant at Fortis Healthcare, said.

According to the World Health Organisation, liver diseases are the 10th most-common cause of death in India. Since the liver is a multi-function organ, it is susceptible to viruses, toxic substances, and contaminants present in food and water.

People with liver problems often experience few or no symptoms. While there have been major advances in treating liver diseases, a complete cure is still elusive. The only way to manage a failed liver is to get a transplant. —PTI

**WHY THE OPERATION**

- The woman's two-and-a-half-year-old son was suffering from a liver disease and as his condition deteriorated, she voluntarily donated a part of her liver
- **The entire procedure took 10 hours, the hospital said. The recovery was smooth and uneventful involving a month's hospital stay**

II. **Conscious Incompetence-** stage of maximum struggle where team tries to surpass all the hurdles

- The best situation is to have a mentor present in OR during procedure- learning will be faster without any mishaps
- Do not search for the ideal candidate - no donor is an ideal donor, only steps are ideal!
- Stepwise approach – target completing one step at a time (e.g. liver mobilisation, porta dissection, partial liver transection)
- Avoid wasting time - decide amongst your team that you are going to dedicate 3-4 hours for the procedure during early learning and then convert. Do not make it an ego issue!
- Make it a habit to pen down your hurdles and probable solutions
- Keep experimenting and looking for your working style, port positioning, port switching (for instruments), take inputs from your team.
- Learn laparoscopic suturing and basic laparoscopy skills

III. **Conscious Competence -** stage where the planned procedure can be completed with effort

- Team is getting trained in their respective roles
- Chief surgeon comes to know about her/his dexterity and style of working
- Team gives constructive feedback to streamline and speedup the procedure
- Surgical time improves consistently
- There may be conversions but are fewer
- Anatomical variations are relative contraindications

IV. **Unconscious Competence -** Final stage of learning where major part of procedure is done at a subconscious level

- Team becomes very confident in handling the procedure
- Learning curve flattens
- Junior surgeons in the team also gain confidence in handling few steps of the procedure
- Everybody starts paying attention to doing things with more finesse so that recipient outcomes are similar to open donor hepatectomy if not better
- Anatomical variations are accepted
- Primary team starts training other teams

Our Team went through all these stages. Approximately 10-15 procedures are required at every stage to proceed to next stage. We reached final stage of learning after approximately 60 cases *(Figure 2)*.

*Figure 2: Our team at work*


Sharing a few tips and tricks of our technique for PLDH.

1. **Patient and port placement** *(Figures 3 and 4)*:
   Initially we faced a lot of challenges with ports placements. We learnt through trials and errors that firstly, it is important to maintain adequate distance between ports to prevent instrument clashes. Second, the port

placements need to be flexible depending on the type of abdomen and size of liver. Placing the umbilical port can be supra- or infra- umbilical depending on the length from xiphoid to umbilicus. If ports are too far, it may be difficult for the instruments to reach. Also most ports we use are 12mm (except xiphoid) so that we can use all ports interchangeably as per our convenience. Also, if required we don't hesitate to change or add more ports.

*Figure 3: Donor positioning*

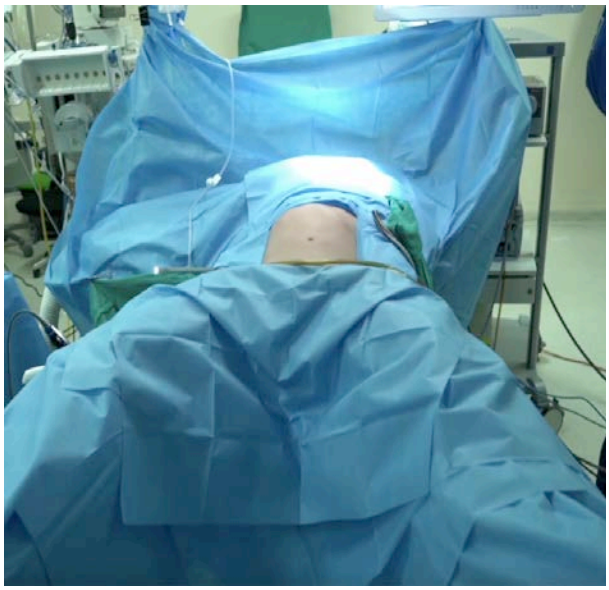
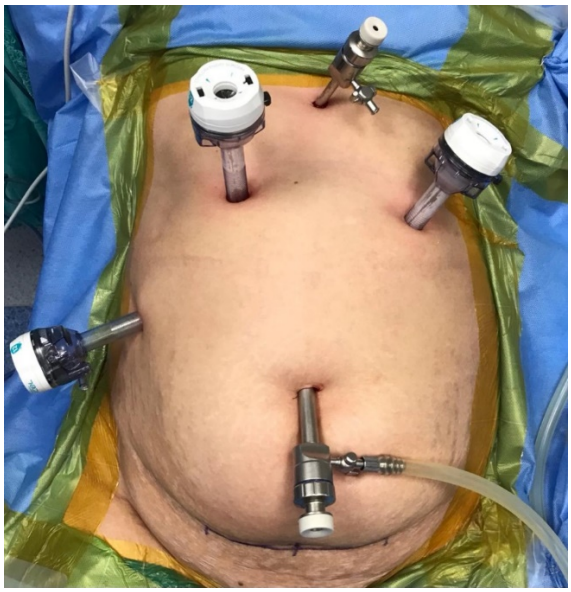


*Figure 4: Port placement*



2. **Right lobe mobilisation and IVC dissection:**
   This can be a bit tricky especially with large right lobe. Selecting initial cases with a smaller right lobe can help with the learning curve. The gall bladder can be used for traction to lift/turn the right lobe in addition to gold finger retractor (we cover the tip with a gauze to avoid inadvertent injury). Harmonic scalpel and hook with cautery are used to help with dividing the ligaments. Xiphoid port is used for the suprahepatic dissection of IVC. A flexible 3D scope is of great use during right lobe mobilisation and cava dissection.
   We find that it is best to complete IVC dissection before starting the next steps as we have the luxury of the GB for retraction. Also after transection, it becomes difficult to rotate the liver. Large IHV are tackled with hemoclips. We do not hesitate to use a vascular stapler to divide a caudate wrap or a large IHV. Once dissection is done, a grasper or goldfinger can be used to accentuate the plane between the RHV and MHV and allow placement of a Ryle's tube to used later for hanging manoeuvre. A laparoscopic Debakey forceps can help with the looping of veins.
3. **Porta dissection:**
   Cystic artery is identified and divided first. We don't divide the cystic duct yet as GB is still helpful for retraction. We prefer a 2-point retraction with a grasper at GB and another on the cystic duct to help us divided the peritoneum over the portal vein. The right portal vein is identified and a sling is placed around it. Difficulty in looping the RPV can be solved by dividing the caudate below. In case of type C portal anatomy,

sometimes, it may be difficult to loop the anterior RPV. In such a scenario, we simply clamp the entire PV (or the RPPV and RAPV without slinging, using a long bulldog). Right hepatic artery is similarly looped and clamped to mark the demarcation. Small clips should be used to tackle arterial branches.

We do IOC in each case by diving the cystic duct and cannulating it using a ureteric catheter. This helps in confirmation of biliary anatomy and avoiding mishaps. We inject ICG once the RHA and RPV are clamped. This not only helps in ensuring the exact line of transection but also helps in bile duct division later. GB is removed after this.

4. **Transection:**

We use laparoscopic CUSA in addition to harmonic scalpel. Lap CUSA helps in getting good quality veins for later reconstruction and also reduces bleeding and bile leaks from the pedicles. The principles of transection remain same. MHV needs to be followed meticulously to avoid missing the plane. Care must be taken to ensure that all segment 8 veins have been dealt with before the hanging manoeuvre.

In the event of bleeding during transection, we reduce pneumoperitoneum to avoid embolization. Using a gauze piece and argon can help to stop small venous bleeds. For bleeding from larger veins, it is important to dissect and divide them (using clips/ hemoclips) to stop the bleeding.

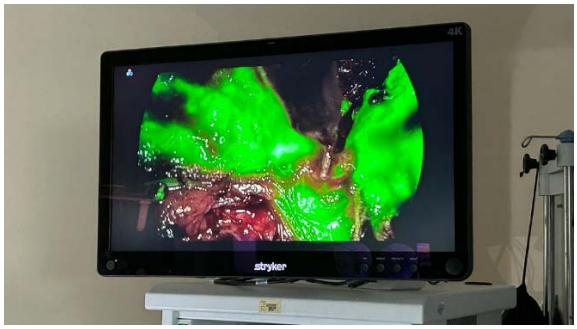
5. **Bile duct division** *(Figure 5)*:

Once transection is completed, we use IOC and ICG to locate the exact site of duct division. We prefer to loop the RHD/s and clip it with hemoloks before cutting it. Rarely the duct may be divided then clipped. In case of 2 ducts on the right, if close by, they may be looped together. We prefer looping each duct separately as far as possible to minimize the risk of clip slippage.

The hilar plate is looped, clipped and divided as well. It is important to ensure avoiding inadvertent injury to RHA during duct division. We have DELHI technique of duct division which can be summarised as:

- IOC/ICG for anatomy and optimal site of duct division
- Sharp incision of hilar plate without diathermy
- Loop the duct
- Hem-o lock clip and cut

*Figure 5: ICG for bile duct anatomy*




6. **Pfannensteil incision:**

Once duct is divided and transection is complete, a Pfannensteil incision is made. It is important to ensure that all perforating vessels are properly handled to avoid hematoma at the incision site later. Another 12 mm port is placed through the Pfannensteil incision and a retrieval bag is placed. The right lobe graft is positioned inside the bag such that it falls into it once pedicles are divided.

7. **Graft retrieval:**

One of the important factors that determine outcomes compared to open donor hepatectomy is providing similar warm ischemia time (WIT) during graft retrieval. Although many papers report similar patient outcomes with WIT as long as 15 minutes, in our study (unpublished) we found that longer WIT often leads to graft injury especially with slightly marginal grafts. To avoid long WIT, we do the following: Completing caval dissection in entirety before retrieval, Keeping the needed staplers ready, Giving the Pfannensteil incision without opening the peritoneum prior to heparinisation and intraperitoneal venting of portal blood after portal vein division.

It is essential to follow the basic caveats too. It is important to have good instruments and good posture to avoid fatigue. Always keep donor safety first; don't hesitate to convert. And above all, enjoy what you do.

**Our results:**

We have done a total of 250 PLDH between October 2019 to November 2023. Of these, 199 were right lobe retrievals, 28 left lobe retrievals, 22 left lateral segments and 1 right posterior sector graft. Over the last 150 cases, we have zero conversion to open. Our average WIT in PLDH is 3.36 ± 0.92 minutes (vs 3 ± 0.96 minutes in open donor hepatectomy). Our donor biliary complication rate is 0.8% in PLDH (vs 1.5% in open). This can be attributed to the difference in number of cases as well initial selection of donors with single duct in the PLDH cohort. We have a 92.4% 30-day recipient survival rate in our PLDH cohort (vs 96.45% in our open donor cohort).

# BIOLOGICAL AGENTS IN LIVER TRANSPLANT

**Dr Sachin Palnitkar**
Consultant Hepatologist and Liver Transplant Physician,
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The use of biological agents, particularly monoclonal antibodies, has revolutionized the field of immunosuppressive treatment in liver transplant. These agents specifically target components of the immune system to prevent rejection of the transplanted liver while minimizing the overall immunosuppressive drug load. Monoclonal antibodies such as basiliximab and alemtuzumab have become integral components of immunosuppressive regimens in LT. They target specific immune cells to prevent rejection, allowing for lower doses of traditional immunosuppressive medications like CNIs and corticosteroids. This targeted approach not only reduces the risk of graft rejection but also mitigates the adverse effects associated with higher doses of these drugs. The evolving landscape of immunosuppressive treatment in LT underscores the importance of personalized medicine, where the selection and combination of medications are tailored to the individual patient's needs. This approach not only improves outcomes but also minimizes the overall medication burden on the recipient.

Current immunosuppressive treatment in LT typically has combination of medications, including calcineurin inhibitors (CNIs), corticosteroids, inhibitors of the molecular target of rapamycin (mTOR), anti-metabolites, and biologic agents. This approach allows for lower dosages of each medication, reducing the

**Table 1 Classification and Action of Immunosuppressants.**

| Immunosuppressant | Action |
|---|---|
| **T-cell activation inhibitors** | |
| Cyclosporine | Inhibits calcineurin via cyclophilin, blocking IL2 transcription |
| Tacrolimus | Inhibits calcineurin via FKBP12, blocking IL2 transcription |
| Belatacept | CTLA-4 homologue competing with CD28 for CD80/86 binding, inhibiting T-cell co-stimulation |
| **T-cell depletion** | |
| Anti-thymocyte globulin | Antibody preparation directed against lymphocytes |
| Alemtuzumab | Anti-CD52-specific antibody highly depletive of lymphocytes, as well as NK cells, monocytes and thymocytes |
| Muromonab-CD3 (OKT3) | Anti-CD3-specific antibody causing T-cell depletion |
| **T-cell proliferation inhibitors** | |
| MPA prodrugs | IMPDH inhibitor: enzyme required for de novo synthesis of guanosine nucleotides, required for lymphocyte proliferation |
| mTOR inhibitors | mTOR blockade prevents IL2-induced T-cell proliferation |
| Azathioprine | Inhibits purine synthesis, thereby blocking immune cell proliferation |
| IL2 receptor antibodies | Blocks IL2 engagement and resultant lymphocyte proliferation |

potential for graft rejection and simultaneously diminishing the toxicity associated with each drug.

Biological immunosuppressives play a crucial role in liver transplant procedures. They are classified into two main categories: T-cell-depleting agents and non-depleting agents. T-cell-depleting agents include polyclonal antibodies such as ATGs, monoclonal antibodies like alemtuzumab (Campath-1H), and muromonab-CD3. On the other hand, non-depleting agents encompass interleukin 2 receptor antagonists (IL-2Ra) and anti-CD28 inhibitor (Belatacept).

Polyclonal T-cell-depleting antibodies, such as anti-thymocyte globulins, play a crucial role in depleting circulating lymphocytes and are commonly used to treat steroid-resistant rejection in liver transplant recipients. While ATG is rarely used as an induction agent in liver transplantation, it has shown efficacy in specific cases. Two main preparations of ATG are available - ATGAM, derived from horses, and Thymoglobulin, of rabbit origin. These medications have demonstrated their efficacy in managing rejection episodes in liver transplant recipients.

Monoclonal antibodies: Alemtuzumab (campath- 1H) is a humanized rat monoclonal antibody against CD52 receptors on peripheral mononuclear cells. It has a significant depleting effect on peripheral as well as lymph node lymphocytes. As a potent immunosuppressant agent alemtuzumab has its own potential benefits for induction therapy in LT. It has lost the charm due to increased risk for infectious complications, specific subgroups, like groups who are in of need renal sparing regimens. The safety of alemtuzumab induction is most in doubt in HCV positive recipients as increased complications and a rapidly progressive recurrence of HCV have been reported. Further studies are required to address the risk benefit issues on use of this agent as induction immuno- suppression for LT.

Muromonab-CD3 (OKT3) was a monoclonal antibody directed against CD3 receptors on peripheral T-cells that was successfully used for the treatment of steroid unresponsive acute liver rejection and also for immunosuppression prophylaxis. However, the side- effect profile was considerable and with the availability of newer agents, the manufacturer discontinued its production in 2010.

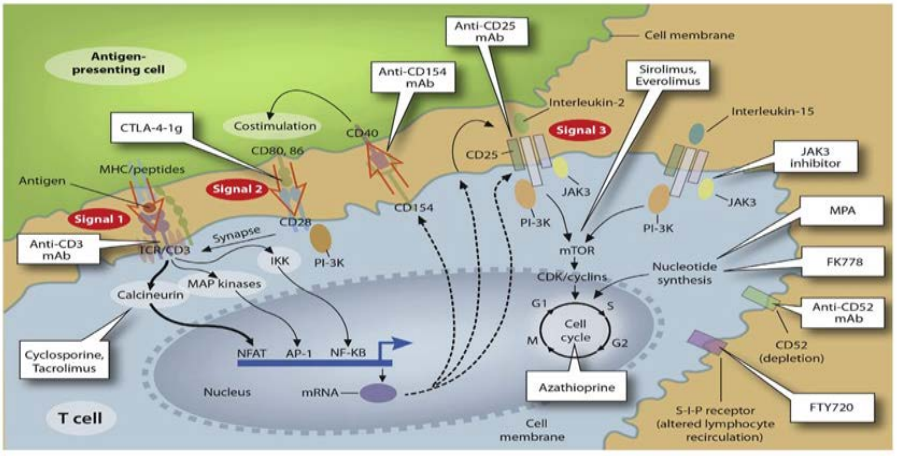



**Figure 2** Individual immunosuppressive drugs and sites of action in the Three-Signal Model (adapted with permission from Halloran et al[13]).

Non-depleting antibodies: IL-2Ras are humanized monoclonal antibodies that bind to IL-2 receptor on T-cells and thus suppress the proliferative response of T-cells to circulating IL-2. These agents are less immunogenic than other antibodies such as OKT3. For LT, specific role of IL-2R in patients who need to avoid or to decrease dosages of an accompanied immunosuppressant agent, such as corticosteroids or CNIs. Less frequent diabetes mellitus, less CMV infections and higher glomerular filtration rate where few important aspects were highlighted among patients receiving IL-2Ra vs those who received corticosteroids as induction therapy. The two IL-2Ra agents, basiliximab and daclizumab did not differ in the mentioned advantages when analyzed by Penninga et al and may be used interchangeably. Although, daclizumab has been off the market since about 2010. Basiliximab induction was not associated with increased risk of PTLD, CMV infection or HCV recurrence in another study by Ramirez et al, while the rate of acute rejection was decreased, and rejection free survival increased. Furthermore, monoclonal antibodies, including anti-interleukin-2-receptor antibodies and basiliximab, have shown promise in reducing acute cellular graft rejection in liver transplant recipients. Studies have demonstrated the efficacy of basiliximab in combination with a tacrolimus-based immunosuppressive regimen in reducing episodes of acute cellular rejection and increasing rejection-free survival after liver transplantation. The use of these biological agents has significantly improved outcomes in liver transplantation, ensuring better graft survival and overall patient well-being. These antibodies are used as induction agents or to treat steroid-refractory rejection in liver transplant recipients. Importantly, antibody induction is commonly utilized in "steroid-free" protocols and as calcineurin inhibitor sparing agents. The "steroid-free" regime has demonstrated its benefits, particularly in hepatitis C and non-alcoholic steatohepatitis-related cirrhosis. Furthermore, antibody induction allows for the delayed introduction of CNIs, thereby safeguarding renal function in liver transplant recipients. Studies have indicated a decrease in acute rejection episodes and no increase in adverse side effects with antibody induction, although the costs associated with these agents should be taken into consideration.

# JOURNAL CLUB

## *Hepatology*

**Dr N Murugan**
Senior consultant hepatologist and liver transplant physician
Apollo Hospital, Chennai

***GOOD READS:***

1. Kumar A, Acharya SK, Singh SP, Duseja A, Madan K, Shukla A, Arora A, Anand AC, Bahl A, Soin AS, Sirohi B, Dutta D, Jothimani D, Panda D, Saini G, Varghese J, Kumar K, Premkumar M, Panigrahi MK, Wadhawan M, Sahu MK, Rela M, Kalra N, Rao PN, Puri P, Bhangui P, Kar P, Shah SR, Baijal SS, Shalimar, Paul SB, Gamanagatti S, Gupta S, Taneja S, Saraswat VA, Chawla YK. **2023 Update of Indian National Association for Study of the Liver Consensus on Management of Intermediate and Advanced Hepatocellular Carcinoma: The Puri III Recommendations.** J Clin Exp Hepatol. 2024 Jan-Feb;14(1):101269. doi: 10.1016/j.jceh.2023.08.005. Epub 2023 Aug 19. PMID: 38107186; PMCID: PMC10724697.
   Comment: *This is a comprehensive and practical update on HCC management adapted for Indian scenario. A must read for all, and very useful guidelines to follow in day to day practice*.

***ARTICLE IN FOCUS:***

**Etiological cure prevents further decompensation and mortality in patients with cirrhosis with ascites as the single first decompensating event.**

**Authors:** Tonon M, Balcar L, Semmler G, Calvino V, Scheiner B, Incicco S, Barone A, Paternostro R, Gambino CG, Bauer DJM, Accetta A, Hartl L, Brocca A, Jachs M, Trauner M, Mandorfer M, Angeli P, Reiberger T, Piano S.

**Journal:** Hepatology

**Institutes:** University of Padova, Italy and the University of Vienna, Austria.

**DOI:** 10.1097/HEP.0000000000000460.

**Summary:**
To study the impact of removal or suppression of the primary etiological factor in patients with cirrhosis who developed ascites as the single index decompensating event.
The etiology was considered "cured" (alcohol abstinence, hepatitis C cure, and hepatitis B suppression) versus "controlled" (partial removal of etiologic factors) versus "uncontrolled." A total of 622 patients were included, etiology was

"cured" in 146 patients (24%), "controlled" in 170 (27%), and "uncontrolled" in 306 (49%). During follow-up, 350 patients (56%) developed further decompensation. In multivariable analysis (adjusted for age, sex, varices, etiology, Child-Pugh class, creatinine, sodium, and era of decompensation), etiological cure was independently associated with a lower risk of further decompensation (HR: 0.46; p = 0.001). During follow-up, 250 patients (40.2%) died, while 104 (16.7%) underwent LT. In multivariable analysis, etiological cure was independently associated with a lower mortality risk (HR: 0.35, p < 0.001).

**Comments:**

It is well known that etiology cure as described above results in considerable improvement in clinical outcomes in many patients with compensated cirrhosis, and should be done as a standard of care. This study illustrates the fact that even in early decompensated states, etiology control can result in significant clinical improvement, improved MELD scores and lower 5-year mortality. It is to be noted that an etiology cure does not reduce the risk of HCC or dying from non-liver causes. Whilst patients with a MELD > 15 were found to have less progression to decompensation after cured etiology, a higher MELD cutoff where early liver transplant may be more prudent was not analysed.

We can infer from this study that in early decompensation, with ascites as a single event, we should aim to "cure" etiology, with emphasis on maintaining long term alcohol abstinence and compliance with antivirals, thus reducing risk for further decompensation, mortality and need for live transplantation in a significant number of patients.

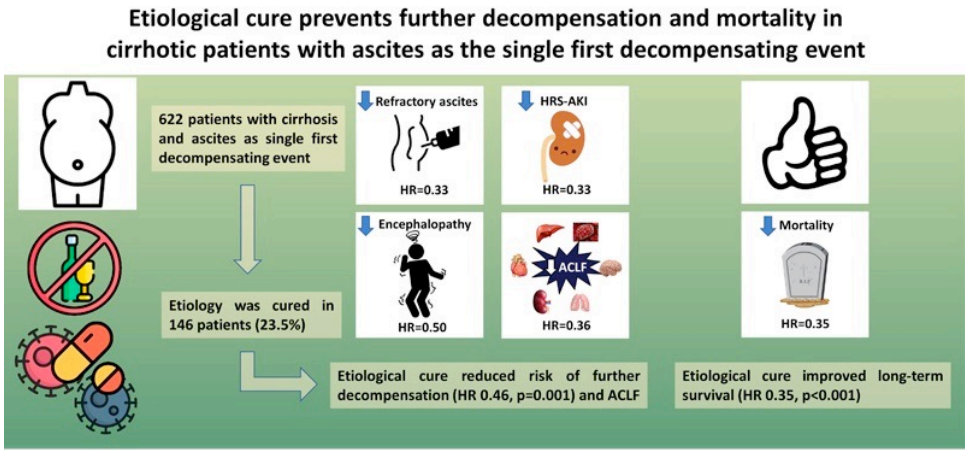



*Figure 1 Toni et al Hepatology 2023*

## *Liver transplant surgery*

**Dr Vibha Varma**
Senior consultant HPB and liver transplant surgeon

***GOOD READS:***

1. Hong SY, Yi NJ, Hong K, Han ES, Suh S, Lee JM, Hong SK, Choi Y, Jin US, Chang H, Lee KW, Suh KS, Minn KW. **Redo hepatic artery reconstruction for thrombosis without retransplantation in 1355 adult living donor liver transplantations.** Liver Transpl. 2023 Sep 1;29(9):961-969. doi: 10.1097/LVT.0000000000000185. Epub 2023 Jun 1. PMID: 37254603.
2. Kubo M, Tomimaru Y, Gotoh K, Kobayashi S, Marukawa D, Sasaki K, Iwagami Y, Yamada D, Akita H, Noda T, Takahashi H, Asaoka T, Tanemura M, Marubashi S, Nagano H, Dono K, Doki Y, Eguchi H. **Long-Term Feasibility of Rescue Reconstruction for Isolated Bile Ducts With Using Cystic Duct in Living Donor Liver Transplantation.** Transplant Proc. 2023 Sep;55(7):1611-1617. doi: 10.1016/j.transproceed.2023.03.086. Epub 2023 Jun 28. PMID: 37385837.
3. Sambommatsu Y, Hirukawa K, Shimata K, Honda M, Sakurai Y, Ishii M, Ibuki S, Isono K, Irie T, Kawabata S, Hirao H, Sugawara Y, Tamura Y, Ikeda O, Hirai T, Inomata Y, Morinaga J, Hibi T**. Hepatic venous outflow obstruction after adult living donor liver transplantation.** Liver Transpl. 2023 Dec 1;29(12):1292-1303. doi: 10.1097/LVT.0000000000000234. Epub 2023 Aug 7. PMID: 37540170.

***ARTICLE IN FOCUS:***

**Recurrence-free Survival After Liver Transplantation Versus Surgical Resection for Hepatocellular Carcinoma: Role of High-risk MRI Features.**

**Authors:** Dong Ik Cha , Jong Man Kim, Woo Kyoung Jeong , Nam-Joon Yi , Gyu-Seong Choi , Jinsoo Rhu, Kwang-Woong Lee, Dong Hyun Sinn , Jeong Ah Hwang, Won Jae Lee, Kyunga Kim, Kyung-Suk Suh, Jae-Won Joh.

**Journal:** Transplantation

**Institutes:** Samsung Medical Center, Sungkyunkwan University School of Medicine, and Seoul National University College of Medicine, Seoul, Republic of Korea.

**DOI:** 10.1097/TP.0000000000004675.

**Summary:**
This study aimed to evaluate RFS and OS after liver transplantation (LT) or liver resection (LR) for HCC) and perform subgroup analysis for HCC with high-risk imaging findings for recurrence on preoperative liver magnetic resonance imaging (MRI; high-risk MRI features).

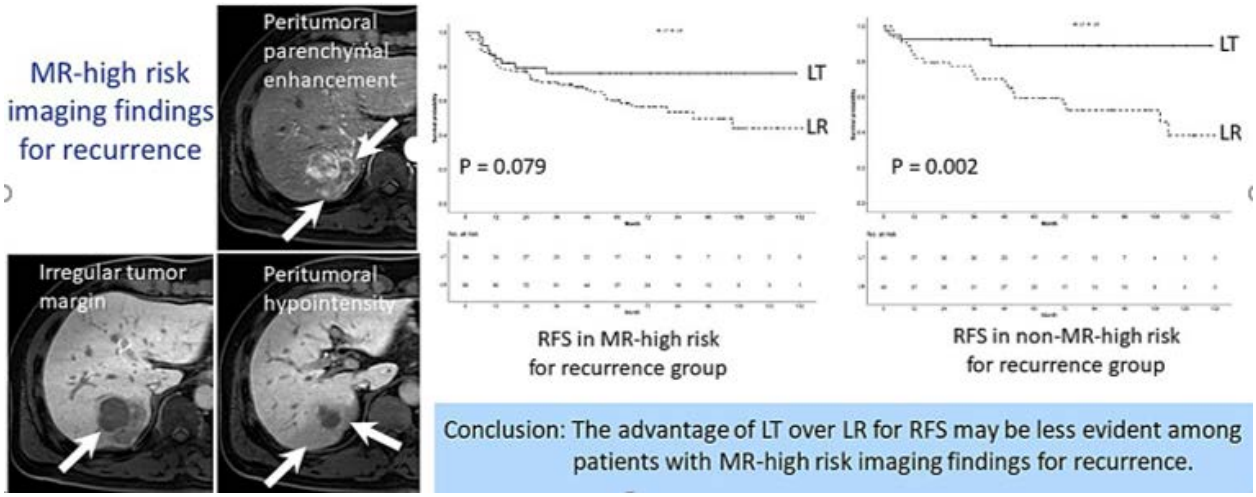
Authors included patients with HCC eligible for both LT and LR and received either of the treatments between June 2008 and February 2021 from 2 tertiary referral medical centers after propensity score-matching. Propensity score-matching yielded 79 patients in the LT group and 142 patients in the LR group. High risk MRI features for recurrence were identified as peritumoral parenchymal enhancement, irregular tumor margin, and peritumoral hypointensity. High-risk MRI features were noted in 39 patients (49.4%) in the LT group and 98 (69.0%) in the LR group. The Kaplan-Meier curves for RFS and OS were not significantly different between the 2 treatments among the high-risk group (RFS, P = 0.079; OS, P = 0.755). Multivariable analysis showed that treatment type was not a prognostic factor for RFS and OS. Authors conclude that the advantage of LT over LR for RFS may be less evident among patients with high-risk MRI features.

**Commentary** (by Laurence, Jerome Martin MBChB, PhD, FRCS(C). Department of Transplant Surgery, University of Sydney, Royal Prince Alfred Hospital, Australia):

Certain high-risk features on the liver MRI are associated with pathological MVI (MR-MVI). When MR-MVI was present preoperatively, RFS and OS not was statistically different between LT and LR groups. This is conceptually intriguing as it challenges our a priori intuition with respect to the superiority of transplantation. 2 major methodological issues temper the strength of the conclusions-

1) Decreasing sample size, subgroup analysis on statistical power must be considered (especially when there is no difference between LR and LT groups)
2) Despite propensity matching - demonstrable differences in disease state of populations (severity of portal hypertension), patient-related (fitness, social conditions, donor availability), disease-related (location of tumor[s], varices, prior foregut surgery, liver morphological distortions) factors are difficult to detect, especially in retrospect (which determined the treatment allocation)

Allocation to LT or LR was a decision made by clinicians for specific reasons (for eg. non-availability of donors), assessment of MR-MVI may be a consideration but likely only a minor factor to be weighed in the decision matrix.



**Author suggestion:** *Please read this paper which gives a different perspective.*

Di Sandro S, Sposito C, Ravaioli M, et al. **Surgical Treatment of Hepatocellular Carcinoma: Multicenter Competing-risk Analysis of Tumor-related Death Following Liver Resection and Transplantation Under an Intention-to-treat Perspective.** Transplantation. 2023 Sep;107(9):1965-1975. DOI: 10.1097/tp.0000000000004593. PMID: 37022089.

A multicentre study from Italy.

**Summary:**

Multicenter retrospective identification of HCC amenable to both LR and LT was done. Nomogram based risk stratification (AFP, AST, MELD, CTP, tumor burden - nodule number and size) and propensity score matched study of oncological outcomes of LR & LT for HCC, stratifying the study population into a low, intermediate & high-risk class (risk of death at 5-y predicted by a previously developed prognostic model). The impact of tumor pathology on oncological outcomes of low- & intermediate-risk. Ninety-nine high-risk patients selected from each treatment cohort were selected through propensity-matching). Three & 5-y cumulative incidence of tumor-related death were 29.7% & 39.5% vs. 17.2% & 18.3% for LR and LT group (P = 0.039), respectively. Low-risk and intermediate-risk patients with LR and presenting satellite nodules and MVI had significantly higher 5-y tumor-related death (29.2% vs. 12.5%; P < 0.001). The study concluded that high-risk patients had significantly better ITT tumor-related survival after upfront LT than LR. Cancer-specific survival of low and intermediate-risk LR patients was significantly impaired by unfavorable pathology, suggesting the application of ab-initio salvage LT in such scenarios.

**Comments on the 2 articles-** *High risk HCC benefit most from upfront LT than LR, while low/intermediate-risk classes share similar oncological outcomes after the 2 treatments, provided they do not show unfavorable tumor pathology. Satellite nodules and MVI on resected specimen warrants immediate listing and salvage transplant. Role of locoregional therapy and the effect of the same on the oncological outcome is not mentioned in these papers.*

## *Anaesthesia/ critical care*

**Dr Sunil Kumar Narasaiah**
Senior Consultant in liver transplant anaesthesia and critical care
Star Hospital, Hyderabad

***GOOD READS:***

1. Flores AS, Forkin KT, Brennan MM, Kumar SS, Winegar DA, Viola F. **Multicenter evaluation of the Quantra with the QStat Cartridge in adult patients undergoing liver transplantation.** Liver Transpl. 2023 Nov 1;29(11):1216-1225. doi: 10.1097/LVT.0000000000000138. Epub 2023 Mar 29. PMID: 36976255; PMCID: PMC10578515.

***ARTICLE IN FOCUS:***

**Prognostic value of two-dimensional strain-echocardiography in patients with liver cirrhosis in Intensive Care Unit. A prospective, observational Study.**

**Authors:** Sophia EL Boukili, Laurent Reydellet, Valery Blasco, Karim Harti, Jacques Albanese, Cyril Nafati.

**Journal:** Journal of Liver Transplantation

**Institutes:** La Timone hospital, Assistance Publique-Hôpitaux de Marseille, Aix Marseille University, Marseille, France

**DOI:** 10.1016/j.liver.2023.100165.

**Summary:**

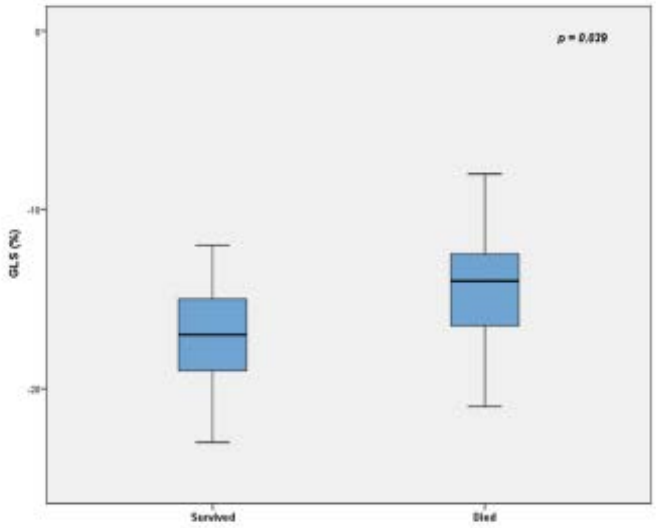
Cirrhotic cardiomyopathy (CCM) is a major comorbidity of cirrhosis. This study is a prospective observational study to assess whether the 2D-strain will allow a more relevant assessment of CCM than conventional echocardiography.
48 consecutive patients were included. Exclusion criteria were age < 18 years, absence of normal sinus rhythm, refusal of participation and previous known heart disease.
The apical, lateral-basal, and septo-basal points were positioned on the LV wall for the software to delineate the ventricular myocardium during a cardiac cycle and determine the regional strain and Global Longitudinal Strain (GLS). The distribution of variables was studied and the association between the variables and 28-day mortality rate was analysed.
GLS impairment was noted in a total of 28 patients (64%). GLS impairment was seen in 75% of patients who died and 54% of patients who survived. GLS was associated with higher 28-day mortality (17 vs 14, p < 0.039).

**Comments:**

CCM is combination of systolic dysfunction, diastolic dysfunction and electrophysiological abnormalities. Newer modalities to assess it include stress echocardiography, stress electrocardiogram and quantitative magnetic resonance imaging. Of these only stress echocardiography is feasible at the bedside. GLS is a measure of left

ventricular function and a diagnostic criterion for systolic dysfunction in CCM. *Normal values for GLS is below 18%.* GLS has excellent feasibility (95%) of myocardial strain. GLS is the only echocardiographic criteria that strongly correlated with 28-day outcome. In advanced cirrhosis, CCM correlates with hepatorenal dysfunction. This study suggests that in critically ill patients, CCM can be detected with GLS. In addition, identifying impaired GLS can lead to careful management of renal function and prevention of hepatorenal syndrome. *Measurement of myocardial strain is recommended at least in patients with end-stage liver disease.*

GLS correlates with prognosis of cirrhotic patients. Further clinical trials are needed on how to incorporate this in clinical practice.




**Global longitudinal Strain was significantly impaired in patients who died as compared with those who survived (GLS − 17 vs − 14, p = 0.039).**

## *Paediatrics*

**Dr Jagadeesh Menon**
Consultant pediatric gastroenterology, hepatology and liver transplant physician
Dr Rela institute and medical centre, Chennai

***GOOD READS:***

1. Rodriguez-Davalos MI, Lopez-Verdugo F, Kasahara M, Muiesan P, Reddy MS, Flores-Huidobro Martinez A, Xia Q, Hong JC, Niemann CU, Seda-Neto J, Miloh TA, Yi NJ, Mazariegos GV, Ng VL, Esquivel CO, Lerut J, Rela M; Pediatric Liver Transplantation Global Census Group. International Liver Transplantation Society Global Census: First Look at Pediatric Liver Transplantation Activity Around the World. Transplantation. 2023 Oct 1;107(10):2087-2097. doi: 10.1097/TP.0000000000004644. Epub 2023 Sep 25. PMID: 37750781.

2. Gautam V, Kumar V, Agarwal S, Gupta S. ABO Incompatible Living Donor Liver Transplantation in Children: A Single Centre Experience from India. J Clin Exp Hepatol. 2024 May-Jun;14(3):101340. doi: 10.1016/j.jceh.2023.101340. Epub 2023 Dec 22. PMID: 38283705; PMCID: PMC10809086.

3. Menon J, Shanmugam N, Valamparampil J, Vij M, Kumar V, Munirathnam D, Hakeem A, Rammohan A, Rela M. Outcomes of liver transplantation in children with Langerhans cell histiocytosis: Experience from a quaternary care center. Pediatr Blood Cancer. 2023 Jan;70(1):e30024. doi: 10.1002/pbc.30024. Epub 2022 Nov 1. PMID: 36317422.

***ARTICLE IN FOCUS:***

**Development and validation of a nomogram to predict allograft survival after pediatric liver transplantation**

**Authors:** Guang-Xiang Gu, Shu-Ting Pan, Yi-Chen Fan, Chen Chen, Qiang Xia
**Journal:** World Journal of Pediatrics
**Institutes:** 4 centers from China (3 from Shanghai and 1 from Guangzhou)
**DOI:** 10.1007/s12519-023-00766-y

**Summary:**

This analysis from China focuses on developing and validating a nomogram to predict post pediatric liver transplant graft survival. This is a retrospective study performed in 2032 children who underwent a liver transplant from 2006 to 2020. The authors review the existing literature by emphasising the lack of an accurate prediction model for assessing the survival probability of grafts, prior to surgery. A few scores which are available

include Pediatric end stage liver disease score (PELD), Survival outcomes following pediatric liver transplant (SOFT) and Pediatric risk of mortality (PRISM) III. The new tool was named as ASPELT (Allograft survival post pediatric liver transplantation).

Children less than 12 years were enrolled in this study. 23 candidate predictors were used which included 20 recipient predictors and 3 donor predictors. The recipients predictors included, age, body weight, growth failure, diagnosis, presence of any heart disease, portal hypertension, gastrointestinal bleeding, cholangitis, ascites, preoperative levels of albumin (g/dL), total bilirubin (mg/dL), prothrombin time (s), international normalized ratio (INR), and IL-1β (pg/mL) as per the results of laboratory tests; perioperative features including direction of the portal vein flow, spleen thickness (mm), spleen diameter (mm), surgical method, graft-to-recipient weight ratio; and the year of transplantation. Body mass index (BMI), relationships to recipients, and ABO compatibility was taken for the donors. The prediction model was developed for graft survival at 1, 3 and 5 years post liver transplant using standard statistical methods.

Results showed a 1-, 3-, 5-, and 10-year graft survival rates of 93.3%, 90.9%, 89.9%, and 87.3%, respectively where a patient survival of 94%, 92%, 91%, and 89% respectively. The adjusted odds ration showed that lower body weight (< 7.2 kg), age ≥ 10 years, heart disease, cholangitis, direction of portal vein flow, spleen thickness (≥ 27 mm), retransplantation, split-liver transplantation, higher levels of total bilirubin (≥ 5.3 mg/dL) and IL 1β(>7.4 pg/ml) increased the risk of allograft dysfunction. The authors have also presented a graphic nomogram in page no. 8 of the manuscript where the prediction of graft survival can be made manually and those with score < 146 falls into low risk, 146-196 falls into median risk and more than 196 falls into the higher risk of graft dysfunction respectively. The ASPELT was found superior to PELD and Child Pugh score with respect to the variables taken and C-indices. (An online calculator is also available; link on page 8 of the manuscript)

# MEETINGS IN FOCUS

## *Joint meeting of LTSI and iLDLT, Jaipur 2023*

**Dr Jagadeesh Krishnamurthy**
Consultant Liver transplant surgeon
Max CLBS, Delhi

We are very proud to announce the successful conclusion of 6th annual conference of Liver Transplant Society of India held jointly with 6th iLDLT group World Congress and 9th CLBS symposium. The theme of this year's world congress was "Liver Transplant Beyond Borders". This event provided a platform for sharing the latest innovations and surgical techniques in the field of liver transplantation. It also promoted medical tourism. Organ donation workshops empowered the transplantation coordinators nationwide to gain expertise from each other.

We had over 500 delegates from 30 countries attending the conference over 3 days from November 17th to 19th, 2023 in Jaipur. Jaipur being a historical city was apt to host the event which was speaking across borders about the best in Liver transplantation. We are grateful to the esteemed faculty who made our scientific extravaganza a great success. 40 international faculty from 22 countries and 120 national faculty graced the event.

***Day 1***

We discussed about the latest innovations in minimally invasive donor hepatectomy and liver transplant surgery. Prof Dieter Broering delivered a talk on cost minimization and future of robotics in transplant. Prof KW Lee, one of the very few in the World to do laparoscopic liver transplantation shared his experience. iLDLTG president Prof Hiroto Egawa enlightened us about the reducing the mortality to near zero in liver transplant. We had a dedicated transplant hepatology session which dealt with updates on immunosuppression, artificial intelligence and post-transplant issues.

The day concluded with inaugural ceremony presided by Honourable Governor of Rajasthan Shri Kalraj Mishra followed by LTSI general body meeting. Dipak Sarma- Flutist extraordinaire, a post ABO-incompatible liver transplant patient himself, performed at the musical night.

***Day 2***

Conference was about sharing updates from across the borders. Experts from around the World shared the commendable works done in Iran, central Asia, Nepal, Philippines, UK, Singapore as well in public sector hospitals in India. The afternoon session had best surgeons enthralling the audience visually with

videos which helps to improve the post liver transplant outcomes. We had a dedicated session on transplant anesthesia and critical which discussed on consensus on pre-operative cardiac evaluation, ICU management and peri-operative challenges. Interventional radiology session by the best in business was lauded by all. We had a team of doctors from NUHS, Singapore who conducted a Virtual Reality workshop on Holo medicine which will be future of liver surgeries worldwide.

The day concluded with iLDLTG general assembly where Prof Kim Olthoff declared as the new president of iLDLTG. Vijay Prakash, the singer of Oscar winning song "Jai ho" enthralled the delegates at the Gala dinner concert. Everyone on the floor shook a leg to the great songs performed by his music band.

***Day 3***

We started with a LTSI debate on the "Hub & Spoke" model by Prof AS Soin and Prof Krish Menon. This was followed by detailed discussions on ABO-incompatible liver transplant and Liver transplantation in ACLF. Prof Mohammed Rela and Prof SK Sarin shared their experiences on ACLF. The session on HCC gave us all the latest updates. The afternoon session had a panel discussion on ensuring gender equality in career opportunities in liver transplantation and deceased donor liver transplant updates. The machine perfusion talks gave us the great insights from across the globe. We had a dedicated session on pediatric hepatology discussing on pre/ post-transplant care and long term outcomes. The transplant coordinator workshop was attended by nationwide transplant coordinators and had brain storming discussions.

The highlight of the day was LTSI Annual Oration by Prof Samiran Nundy who took us along the beautiful journey of evolution of liver transplant in India, which received a standing ovation by over 400 delegates.

We received 120 abstracts from 30 countries. The best abstracts were invited to present their Oral / Video presentations on first two days and were published in Journal of clinical and experimental hepatology.

***The winners were***

**Oral session – 1**

1st place- Renal resistive index – a bedside tool to predict acute kidney injury after living donor liver transplantation: a prospective observational study - Dr Saravanan M

2nd place- Comparison of the effect of isoflurane and propofol on liver regeneration after donor hepatectomy- a randomised controlled trial - Dr SV Abhinaya

**Oral session – 2**

1st place- The current status of ABO blood type incompatible liver transplantation in Japan: 11- year surveillance and additional research of hepatocellular carcinoma and acute liver failure - Dr Yoshihira Hirata

2nd place - International Multicenter Study of outcomes of Ultra-Low GRWR grafts for adult living donor liver transplantation - Dr Ashwin Rammohan

**Oral session – 3**

1st place- Living donor kidney followed by right lobe living donor liver: a dual center case study - Dr Vinay Kumaran

2nd place- Early Recipient Outcomes following neo-Middle Hepatic Vein Thrombosis in modified right lobe graft - Dr Vibha Varma

**Video session**

1st place- Vascular stapler malfunction during laparoscopic donor hepatectomy - Dr Vishal Kumar Chorasiya

**Poster session**

1st place- Dr Vibha Varma

2nd place- Drs Deepti Ramachandra, Sushmita Dongari and Rohit

My sincere thanks to the entire organising team and Prof Subhash Gupta, the Congress president for guiding me to successfully conduct this academic and cultural extravaganza.

## *LTSI Fellows' Symposium 2023*

**Dr Gayatri Balachandran MS, DNB(GI Surgery)**
LTSI Surgical Fellowship candidate,
Gleneagles Global Health City, Chennai

The inaugural LTSI Fellows' Symposium took place on December 16th and 17th 2023 in Kochi. It was a comprehensive programme, tailored for a specific audience - individuals pursuing fellowship courses in Liver transplantation Surgery, Transplant Hepatology and Liver Anaesthesia/Critical Care. Noteworthy was the informal atmosphere of the meeting, designed precisely to offer guidance to trainees and foster open dialogue by removing inhibitions.

Day 1 featured presentations covering recipient and donor selection, intraoperative and post-operative patient management of transplant recipients. Additionally, two sessions delved into the importance of pursuing research, data collation and collaboration. Emphasis was laid on evaluation of evidence, formulation of study questions, and the necessity of involvement in basic and translational science. The symposium underscored the imperative to generate quality publications and presentations from the wealth of data that is available in the country. Also highlighted was the feasibility of maintaining a thriving clinical practice while prioritizing research.

Arguably the best part of the symposium was the relaxed "fireside chat" on the first evening, where senior figures discussed practical topics crucial to trainees like selection of future career pathways, negotiation of the intricacies of corporate practice, challenges of a career in academia and hurdles in setting up of transplant centres. The faculty members readily shared from their individual experiences, which greatly enriched the conversation. Such a candid and personal exchange is not commonly encountered in conventional scientific meetings and that enhanced the overall experience. So engaging was the deliberation, that it went on into the night, well past ten o'clock!

On Day 2, there were excellent visually engaging talks on multiorgan retrieval, surgical techniques of explant hepatectomy and graft implantation, ischemia-reperfusion injury and transplant immunology. Active audience participation facilitated a bidirectional flow of information, and not just didactic teaching. Several of the faculty discussed individual institution practices and fellows were able to raise queries and clarify concepts almost on a one-on-one basis. A particularly novel

talk was on the ever-growing importance of social media platforms, particularly X (formerly known as Twitter) in academic medicine and how to optimally harness their potential in the advancement of the research, dissemination of information to peers and patients, and importantly, to build and maintain professional networks. Being technologically updated and plugged into the social frequency of the scientific community can be profoundly valuable and this was an important takeaway.

The meeting provided a platform for fellows to recount their experiences during training and provide feedback to the LTSI. Several constructive suggestions were volunteered including holding of monthly teaching sessions on web-conferencing platforms, arranging formal workshops on statistical methods, facilitation of observership postings for fellows, formulating mentorship programmes, and standardization of training curriculum for the various fellowship specialities.

The symposium concluded with a talk by LTSI president, Dr Sonal Asthana, outlining the organisation's genesis, history, and long-term goals toward advancing liver transplantation in India. He enumerated the various initiatives, some already in place and several in the pipeline, designed to enable career growth and exposure. Notable ones include support for observerships, research grants for work related to translational medicine, and the creation of an 'Online Educational Universe' containing a wealth of academic content for all members.

It was a fruitful weekend in "God's own country" and it is hoped that such symposia will continue annually, addressing the specific needs of those in training in the field of liver transplantation, both academic and otherwise.

# OFF PISTE

## *Everest Base Camp: Where Adventure Meets Self-Discovery*

**Dr Ravi Chandra R S**
Senior consultant in anaesthesiology and critical care
Gleneagles Global hospital, Hyderabad

Embarking on the EBC trek is more than just a physical challenge; it's a journey of self-discovery and an immersive experience in the heart of the Himalayas. While some may view it as too difficult or even impossible, I believe it's an achievable goal for anyone with the right mindset and preparation.

The initial thoughts of "too expensive," "too hard," or "only for athletes" often cloud our judgment. But the reality is, the EBC trek is accessible to people of all ages and backgrounds. It's true that physical fitness plays a role, but mental strength and determination are equally important. There's no room to blame others for mistakes; it's all on you. This can be a daunting realization, but it's also an empowering one. It forces you to confront your limitations and push yourself beyond perceived boundaries. Freezing cold nights, dangerous rocky terrain, steep cliffs, potential avalanches, limited food, and water, need I say more? It’s a lofty adventure, but one that’s sure to change your life forever.

*Kala Patthar: Place with the best Mount Everest view*

I consider Himalayas sacred and hold it in a special place in my heart. Surrounded by breathtaking mountains, glaciers, and the raw power of nature, one cannot help but feel a sense of awe and humility. As you ascend the trail, the landscape transforms dramatically. Lush forests give way to barren plains, and eventually, all vegetation disappears, replaced by a stark white and grey world of ice and rock. EBC sits at 5,300 meters and the altitude can be a challenge for even the fittest individuals, acclimatization is necessary. We hiked for many hours every day, running out of breath constantly, fighting the elevation. For a week and a half, our daily schedule was- early mornings, long walks, quick meals and resting in a teahouse in the evening. The last days were ice cold and windy. The memories of freezing nights, treacherous terrain, and breathtaking sunrises from vantage points like Kala Patthar will stay with you long after you return home.

While the summit is the ultimate goal, the journey itself is just as important. You'll encounter local people with their warm smiles and adorable children, reminding you of the simple joys in life. With the camaraderie of fellow trekkers bonds will be forged that will last a lifetime. And most importantly, you'll have the opportunity to reflect on your life and come to terms with who you are and what you want to achieve.

If you're looking for a challenge that will push you to your limits and leave a lasting impact on your life, then the EBC trek is for you. It forces you to face your fears, embrace the unknown, and discover an inner strength you never knew you possessed. The sense of accomplishment upon reaching your goal is unparalleled, and it leaves you feeling empowered and ready to tackle any challenge life throws your way.

The right training for EBC trek would comprise of building cardiovascular endurance, strength training and mental conditioning. One should start with full body strength training with flexibility and cardio training for 30 minutes daily. Usefulness of hiking/ trekking with and without a 4 kg backpack at the speed of 6-7 kmph cannot be understated. Depending on one's individual fitness 6 to 8 weeks of prior training should be sufficient to embark the EBC trek.

Recommended booking websites:

www.thenepaltrekkingcompany.com

www.himalayanwonders.com

*At the base camp*


Medanta Institute of Liver Transplantation & Regenerative Medicine
LTSI
Liver Transplantation Society of India
6th INTERNATIONAL
LIVER SYMPOSIUM
AND LTSI CONFERENCE 2024
Liver Diseases and Transplantation in the 2020s and Beyond
8th-10th March, 2024
The Westin
Sector 29, Gurugram (Delhi-NCR)