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Updates on Liver Transplantation: Exploring MELD Score & Donor Safety

Dr. Buch:
Practice guidelines and tools for liver transplantation continue to evolve as clinical advances are made. What facts should we keep in mind when considering liver transplantation? And how do we determine which patients are the right candidates?

Welcome to *GI Insights* on ReachMD. I'm your host, Dr. Peter Buch. And today we're joined by Dr. Koji Hashimoto to update us on liver transplantation. Dr. Hashimoto is the Director of Liver Transplantation at the Cleveland Clinic.

Welcome to the program, Dr. Hashimoto.

Dr. Hashimoto:
Thank you for having me.

Dr. Buch:
Diving right in, Dr. Hashimoto, how do you use the Model for End-stage Liver Disease, or MELD score, to assess transplant candidates? And are there any MELD exception points?

Dr. Hashimoto:
So the MELD score stratifies the risk of mortality of end-stage liver disease, so this score is calculated based on your blood test such as total bilirubin, INR, serum sodium and creatinine. So it's very important to understand why the creatinine in kidney function is included in the liver score because the most of the patients with liver disease, when the liver disease advances, they have kidney failure due to hepatorenal syndrome. So it's very important that the creatinine is included in this MELD score. So this score goes anywhere from 6 to 40. The higher your MELD score goes, the more priority you have on the waiting list. So, for example, you have MELD score 40, so you probably get a liver transplantation in days to week, but if your MELD score is low, your waiting time for transplant will be much longer.

The policy of allocation for liver transplantation is the sickest first, so the higher priority will be given for someone who has high MELD score. Now, even such the fair organ allocation policy we still have a 20 percent of patients dying or becoming too sick waiting for liver transplantation. And so there is some certain medical conditions that you can get medical exception points. So those points will be given to someone who has low MELD score but high likelihood of death on the waiting list, so those include the primary liver cancer, such as hepatocellular carcinoma and cholangiocarcinoma, hepatopulmonary syndrome, pulmonary hypertension and some metabolic diseases.

Dr. Buch:
Great. And which of our patients with primary liver neoplasms are the best candidates for transplantation?

Dr. Hashimoto:
So the most common primary liver neoplasm is hepatocellular carcinoma, HCC. So the HCC is actually a good indication for liver transplantation, but to receive a liver transplantation, HCC needs to be confined in the liver, where if you have metastasis outside of the liver, you lose the candidacy for transplantation. The best indication in HCC is we call Milan criteria. So the tumors are less than 3 cm in up to 3 tumors or less than 5 cm in single lesion. If the patients meet these Milan criteria, you have very good outcome of a liver transplantation. On the other hand, if your tumor is outside the Milan criteria, even you can downstage the tumor to receive liver transplantation. To downstage the HCC, you can get the local regional therapy so which includes trans arterial chemoembolization, Y-90, this is a radio embolization, and also you can receive radiofrequency ablation. We call it RFA. So, for example, if your HCC is 6 cm in the liver, you can receive one of these treatments, and once your tumor size becomes 2 or 3 cm, you will be a good candidate for transplantation. And also, when you talk about transplantation for HCC, the tumor biology is very important, so which means how aggressive the tumor is a very important indicator for the prognosis of transplantation. And alpha fetoprotein, this is a tumor marker for

HCC, is considered as a surrogate for the tumor biology. When alpha fetoprotein is greater than 500 ng/mL, you are not a good candidate for transplantation because of a high recurrence risk.

The second common primary liver cancer is a cholangiocarcinoma, which it used to be a contraindication for liver transplantation, but it was a new treatment protocol that include external beam radiation therapy, brachytherapy, which is the local radiation therapy, and a systemic chemotherapy. You will be eligible for liver transplantation. And with this new treatment protocol for cholangiocarcinoma, the five-year survival for after liver transplantation is about 70 percent.

Dr. Buch:
That's absolutely amazing. Now, could a previous transjugular intrahepatic portosystemic shunt procedure, or TIPS for short, interfere with a future liver transplant?

Dr. Hashimoto:
Actually the presence of TIPS is not a contraindication for liver transplantation. So the TIPS usually placed for someone who has intractable GI bleeding or ascites before liver transplantation to bridge to liver transplant. So this treatment can lower the portal vein pressure, which is very helpful to reduce the intraoperative bleeding because liver transplantation is usually a very bloody surgery because of portal hypertension. By placing a TIPS to shunt between a portal vein and a hepatic vein, we can reduce the portal vein pressure significantly. That's very helpful for us. And we also published a paper recently. So this study shows the survival outcome between a patient with and without TIPS was very similar.

Dr. Buch:
For those just tuning in, you're listening to *GI Insights* on ReachMD. I'm Dr. Peter Buch, and I'm speaking with Dr. Koji Hashimoto about liver transplants.

Dr. Hashimoto, let's switch gears and look at safety. How do you ensure donor safety when considering liver donor transplants?

Dr. Hashimoto:
The living donor is a very important source of liver donor because unless they want to donate a piece of the liver to save someone else, they don't need a surgery or medications, so the living donor safety is most important in living donor liver transplantation. Now, according to the US data, the risk of mortality of living donor is about 0.2 percent. So this is a very small number, but we have to take this number very seriously. And also the risk of major complications after living donor surgery is 20 to 30 percent. This includes bleeding, bile leak, wound infection, and hernia in incision.

At the time of living donor liver transplantation, we can take either left lobe, which is 30 to 40 percent of the liver, or right lobe, which is 60 to 70 percent of the liver. So, to ensure the donor's safety, you may consider taking the left lobe rather than the big right lobe. The other thing to ensure the donor safety is minimally invasive donor surgery, which is a laparoscopic living donor hepatectomy. The Cleveland Clinic is one of the few centers who can provide this minimally invasive, safe technique. With this technique the patient can have a smaller incision, shorter length of stay in the hospital and a lower dose of narcotics use for pain control and a faster recovery after living donation. Most of the living donors who receive this minimally invasive technique, they can go back to work or school within one month.

Dr. Buch:
Pretty amazing. Let's switch areas a little bit. Does using a liver that's been infected with hepatitis C pose any concerns?

Dr. Hashimoto:
So hepatitis C donor is very safe to use from a liver function standpoint because most of the HCV positive donor are young donor. Unless HCV donor has advanced fibrosis, their liver is of great quality. Interestingly, the HCV donors are often used for HCV-negative patients. After transplant with hepatitis C donors, the older patients become viremic. By using the direct-acting antiviral for 12 weeks after liver transplantation, you can almost completely eliminate HCV virus and 99 percent of cure chance.

So, when we use hepatitis C donor, there's a small risk of disease transmission, such as HIV and hepatitis B. So, according to the available data, the risk of transmission of HIV and hepatitis B when we do a liver transplantation is very minimal, so when the patients refuse to receive the hepatitis C donor, which is a good source of liver donor, I always tell them that waiting for liver transplantation on the waiting list has a much higher risk of mortality compared to the risk of disease transmission of HIV and hepatitis C.

Dr. Buch:
And that's even with the immunosuppression that is given to the transplanted patients. That's really amazing. So, with all of that in mind, what is the long-term outcome after a patient receives a liver transplant?

Dr. Hashimoto:

So, generally speaking, the long-term outcome of the liver transplantation is very satisfactory. One-year survival after liver transplantation is greater than 90 percent. Five-year survival is around 70 to 80 percent. But there are some concerns in the long term of liver transplantation. For example, if you receive a liver transplantation for autoimmune disease, such as autoimmune hepatitis, PSC, PBC, there is a 20 percent risk of disease recurrence on the new liver, so those patients need liver transplantation down the road. And after transplantation for alcoholic cirrhosis, the good number of patients start drinking again, unfortunately, so for those patients, very close follow-up by multidisciplinary team is very important. So in this case, a social worker and a psychologist play a very important role in patient care.

When you receive the transplantation for NASH cirrhosis, nonalcoholic fatty hepatitis, it is very important to control metabolic disorders after transplant. And one of the most important issue of the liver transplantation is a chronic kidney failure. There is a 10 to 20 percent risk of kidney failure in 10 years after liver transplantation, and those patients usually end up on hemodialysis. So this happens because the one very important medication for immunosuppression we call tacrolimus is nephrotoxic. And most of the patients are very concerned about acute rejection of the transplant, but it is very rare to lose a liver graft or die because of acute rejection because nowadays we have many, many good immunosuppressant medications to prevent rejection. And even the patient has a rejection, we can reverse the liver function to normal.

Dr. Buch:
Before we close, Dr. Hashimoto, are there any other thoughts you'd like to share with our audience today?

Dr. Hashimoto:
So I want to talk about a new technology of organ preservation. So, after a liver is taken out from a deceased donor, this liver is preserved in a cold solution. But with this cold preservation, the liver graft quality declines as the time goes. So now we have new technology we call machine perfusion with oxygenated blood.

So with this new technology, after the liver is taken from the donor, the donor is connected to the machine profusion pump with oxygenated blood. So by using this, we can check the liver graft viability before transplant, and even we can resuscitate the liver graft to make the transplant surgery very safe, and also, we can potentially increase the number of donor livers.

Dr. Buch:
With those final thoughts in mind, I want to thank my guest, Dr. Koji Hashimoto, for sharing key considerations for liver transplantation.

Dr. Hashimoto, thanks so much for joining us today and sharing your wisdom.

Dr. Hashimoto:
Thank you so much. It's my pleasure.

Dr. Buch:
For ReachMD, I'm Dr. Peter Buch. To access this and other episodes in this series, visit ReachMD.com/GIInsights where you can be Part of the Knowledge. Thanks for listening, and see you next time.