



30 November 2006

The Question

Should marginal liver donors be used for patients who fall outside of the Milan Criteria?

NO

What is a “marginal” liver?

There is no uniformly accepted definition for extended criteria livers, therefore how can the answer be “yes”?

(We’re not talking about kidneys.)

The Evidence

“There are no good or bad organs but only livers bearing different levels of risk...”

S. Feng, et al. Characteristics Associated with Liver Graft Failure: The Concept of a Donor Risk Index. *Am J Transplantation*, 2006.

“It is critical that ... clinicians understand the limitations of defining extended criteria donors in yes or no terms.”

R.B. Freeman and G.B. Klimmalm. Is It Time To Re-Think ‘Extended Criteria.’ *Am J Transplantation*, 2006.

A. Joseph Tector, et al. Use of Extended Criteria Livers Decreases Wait Time For Liver Transplantation Without Adversely Impacting Posttransplant Survival. *Ann Surg*, 2006.

Extended criteria donors	388/571 (68.0)
Age ≥ 60 yr	60 (10.5)
BMI ≥ 35 kg/m ²	51 (8.9)
Maximum serum Na ⁺ ≤ 170 mEq/L	72 (12.6)
Maximum total bilirubin ≥ 2.0 mg/dL	71 (12.4)
Maximum AST ≥ 500 μ L	47 (8.2)
Maximum ALT ≥ 500 μ L	27 (4.7)
Elevated LFTs (Any of following 3: AST/ALT/total bilirubin)	117 (20.5)
Serology (HIV or HCV or HTLV)	35 (9.6)
Non-heart beating donor	16 (2.8)
Cold ischemia time > 12 hours	20 (3.5)
More than 2 pressors at any time	58 (10.2)
ICU stay greater than 5 days	53 (9.3)
EOH use > 30 g/day for 10 years or more	65 (11.4)
Current central nervous system tumor	14 (2.5)
Current meningitis	2 (0.4)
Any history of non-skin cancer	13 (2.3)
Significant liver trauma (\geq grade I injury)	15 (2.6)

Why Milan Criteria?

Currently utilized UNOS criteria for MELD upgrade.

These are currently thought to be too restrictive. What about UCSF Criteria?

What about downstaging?

Both UCSF Criteria and down-staging are currently under consideration by UNOS.

The Evidence

5 year survival rate the same for UCSF as for Milan.

Yao, Francis, et al. Liver Transplantation for Hepatocellular Carcinoma: Comparison of the Proposed UCSF Criteria with the Milan Criteria and the Pittsburgh Modified TNM Criteria. *Liver Transplantation*, 2002.
“Successful tumor downstaging can be achieved in the majority of carefully selected patients...”

Yao, Francis, et al. A Prospective Study on Downstaging of Hepatocellular Carcinoma Prior to Liver Transplant. *Liver Transplantation*, 2005.

Why not living donors instead?

No impact on donor pool

Better recipient outcomes

The Evidence

2002
LDLT: 83 days.
cadaveric: 414 days.

2004
LDLT: 62 days.
cadaveric: 459 days.

Gondolesi, M.D., et al. Hepatocellular Carcinoma: A Prime Indication for Living Donor Liver Transplantation. *J. of Gastrointestinal Surgery*, 2002.

Gondolesi, G. E., et al. Adult Living Donor Liver Transplantation for Patients With Hepatocellular Carcinoma. *Ann Surg.*, 2004.

The Evidence

“19 of the 30 people in the deceased donor group died waiting for transplant...”

Lo, C.M., et al. The Role and Limitation of Living Donor Liver Transplantation for Hepatocellular Carcinoma. *Liver Transplantation*, 2004.

“...LDLT that were performed for HCC on patients who did not meet the Milan criteria showed favorable outcomes...”

Lee, K.W., et al. Can We Expand The Milan Criteria For Hepatocellular Carcinoma in Living Donor Liver Transplantation? *Transplantation Proceedings*, 2004.

The Evidence

“...no significant difference in the patient survival rates was observed between the patients who met the Milan criteria and those who did not.

Yokoi, H, et al. The role of living-donor liver transplantation in surgical treatment for hepatocellular carcinoma. *J. Hepatobiliary Pancreat Surg.*, 2006.

“LDLT can achieve acceptable survival in HCC patients, even when liver function is markedly impaired...”

Todo, S., et al. Living Donor Liver Transplantation for Adult Patients with Hepatocellular Carcinoma. *Ann Surg.*, 2004.

The Evidence

“...more patients may be potentially cured, without punishing patients on the waiting list with non-malignant liver disease.”

Sauer, P., et al. Liver Transplantation for Hepatocellular Carcinoma: Is there evidence for expanding the Selection Criteria? *Transplantation*, 2005.

“For patients with tumors exceeding the current criteria for prioritization, LDLT offers the only realistic hope for survival.”

Gondolesi, G. E., et al. Adult Living Donor Liver Transplantation for Patients With Hepatocellular Carcinoma. *Ann Surg.*, 2004.

Guiding Principle

A liver transplant either functions or fails to function.

if likely to function it should be placed into a recipient within UNOS tumor criteria.

if not likely to function, it should not be transplanted *at all*.

Conclusion

There is no accepted definition of an “extended criteria liver.”

The Milan criteria are too restrictive.

LDLT offers a far better alternative.