



Liver Transplantation for Hepatocellular Carcinoma: Should UNOS Criteria be Expanded?

Ronald W. Busuttil M.D., Ph.D.

Professor of Surgery

**Chief, Division of Liver and Pancreas
Transplantation**

**The Dumont-UCLA Transplant Center
University of California, Los Angeles**



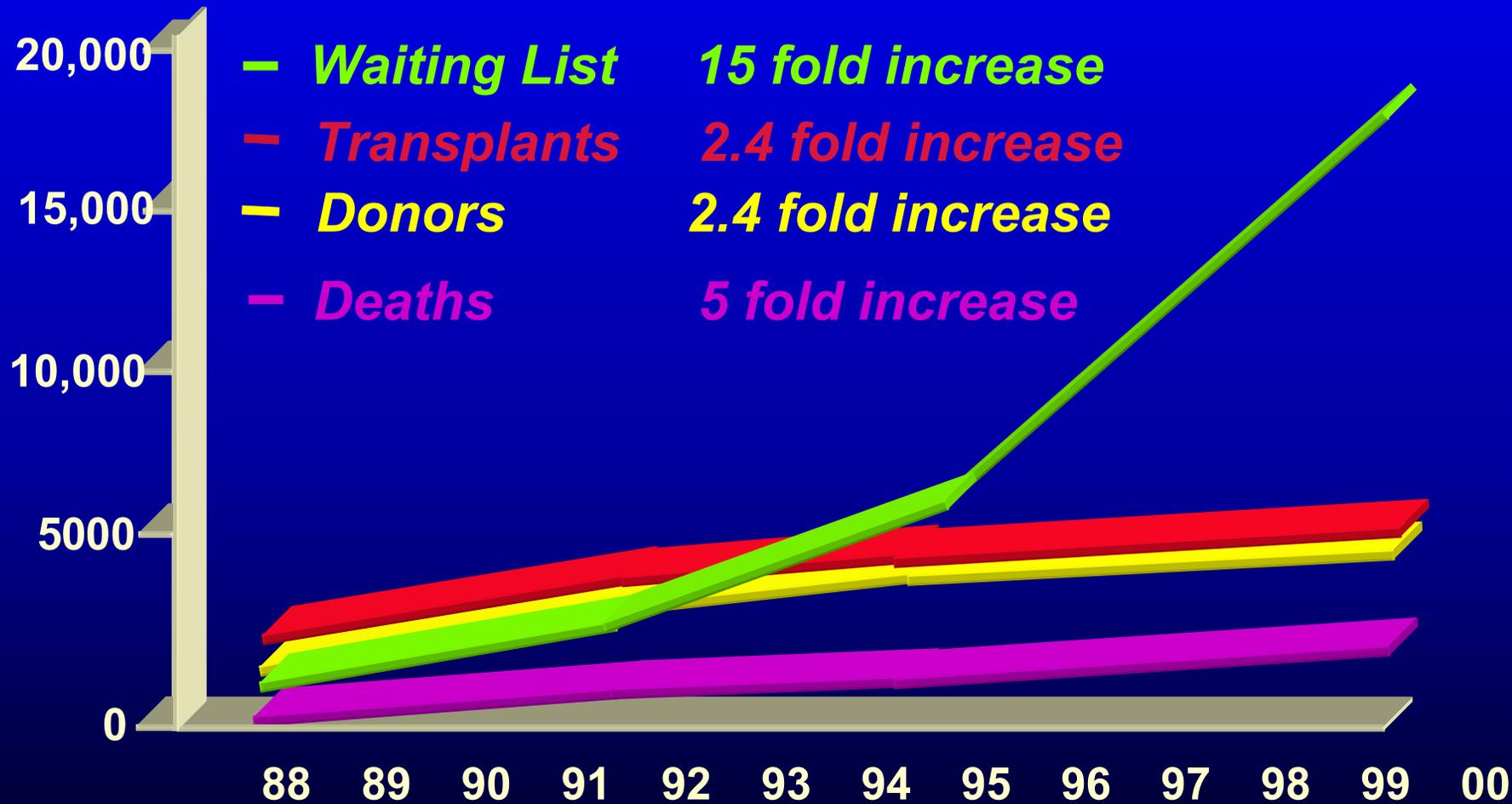
Expanding Criteria for OLT for HCC?

What is an acceptable short and long term survival to justify OLT for HCC using expanded UNOS Criteria?

- This criteria has been applied before
 - 1980's - HCC
 - 1990's - HBV



Increasing Demand for Liver Organs

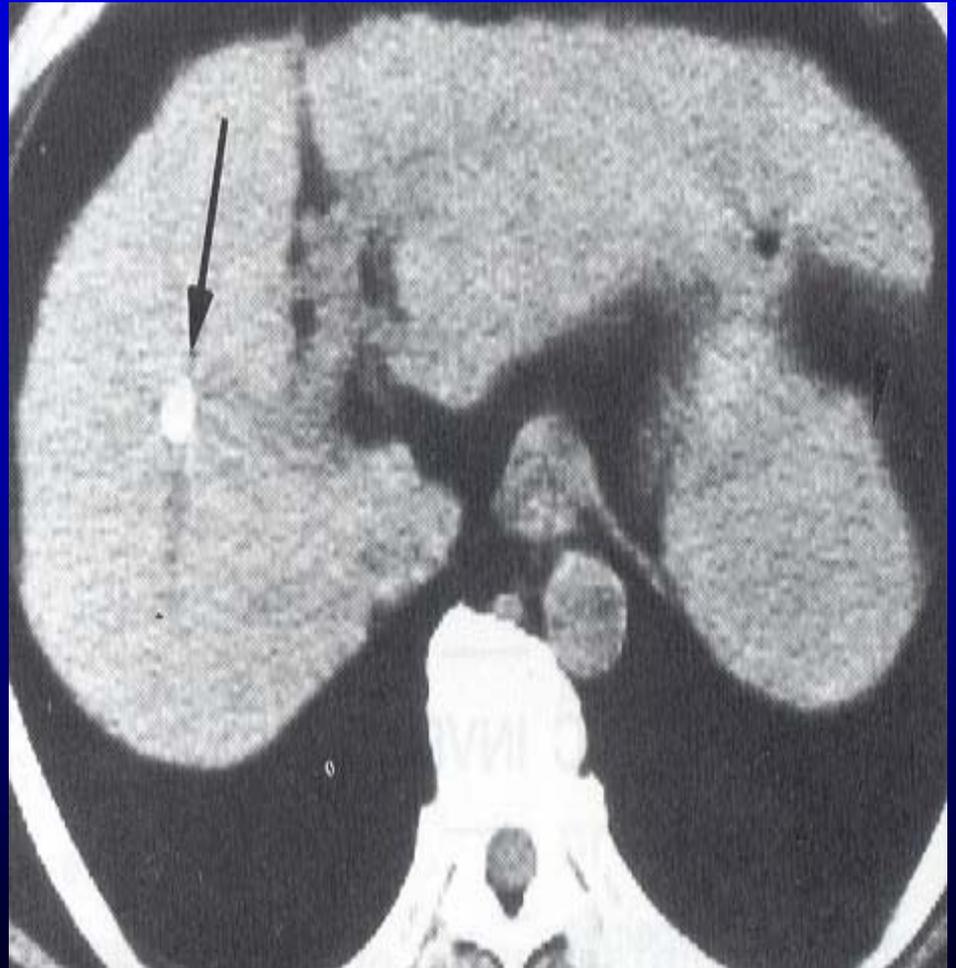


United Network for Organ Sharing



Hepatocellular Carcinoma (HCC)

- Common
- 1 million new cases per year worldwide
- HCV increasing
- Prognosis:
 - Tumor Biology
 - Differentiation
 - Vascular Invasion





OLT for HCC: Evolution of Treatment

- No accurate or practical way to preoperatively determine Tumor Biology or Differentiation
- There is a correlation between size (determined preop) and Vascular Invasion
- Preop determination of size underestimates at least 30% of cases



Recent Outcomes: Restrictive Criteria

Author	n	Criteria	Rec	Survival
Mazzaferro, NEJM 1996	48	1<5cm 3<3cm	8%	74%
Bismuth, Semin LD 1999	45	1<3cm 3<3cm	11%	74%
Llovet, Hepatology 1999	79	1<5cm	4%	75%
Jonas, Hepatology 2001	120	1<5cm 3<3cm	16%	71%



OLT for HCC: Evolution of Treatment

- 2001 Department of Health and Human Services approved HCC as an indication for OLT
- UNOS adopts criteria for organ allocation

UNOS CRITERIA

Single Tumor ≤ 5 cm

OR

Up to 3 Tumors, largest ≤ 3 cm



NOW: Proposals to Expand Criteria ?

- With current MELD system 25% or more of OLT are done for HCC
- Expanding UNOS criteria will increase the number of OLT for HCC by 20-30%



Exceeding UNOS Criteria

Author	n	Note	Survival
Mazzaferro, NEJM 1996	13	>UNOS Explant	50%: 4yr
Klintmalm, Liver Tx 2002 International Registry	232	>5cm	64%: 1yr 33%: 5yr
Yao, Liver Tx 2002	10	>UCSF Criteria 3<4.5 (total <8.5) or 1<6.5	38%: 1yr
	14	>UNOS & ≤UCSF	86%: 2yr (54-96%)
UCLA	97	>UNOS Criteria	64%: 1yr 11%: 5yr



UCSF Criteria Pitfalls

- **14 patients**
- **Evidence “not conclusive” due to wide confidence intervals**
- **42 of 47 patients with known HCC received Chemo-Embo**
- **Most patients were only marginally over Milan Criteria**



UCLA EXPERIENCE

- **1984 to 2002**
- **UCLA Medical Center**
- **>3,000 Liver Transplants**
- **250 OLTx with HCC**
 - 101 Incidental**
 - 149 Dx Preoperatively**
 - 52 Meet UNOS Criteria**
 - 97 Exceed UNOS Criteria**



Multifocal Tumors Greater than UNOS & Less than UCSF Criteria

- 9 patients
- 6 (67%) were moderate or poorly differentiated with microvascular invasion
- Mean Age: 53
- Mean F/u: 17 mos

Time	Survival
1 yr	38%
2 yr	29%
4 yr	17%



Unifocal Tumors > UNOS

- **20 patients**
- **Large Unifocal Tumors: Mean = 8 cm (Range 5.1-16 cm)**
- **10 Well Differentiated**
- **Mean Age: 55**
- **Mean F/u: 20 mos**

Time	Survival
1 yr	72%
2 yr	63%
3 yr	47%
4 yr	36%
5 yr	17%



CONCLUSIONS

1. Any change in UNOS Criteria should be evidence based.
2. Considering the shortage of organs there is no supporting data to expand criteria for HCC.
3. A prospective multicenter trial should be conducted prior to any change in criteria.