

Hypothermic Oxygenated Perfusion and Liver Transplantation for Hepatocellular Carcinoma:

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Lower Hepatic Recurrence and Increased Use of Elderly Donors

UNIDADE LOCAL DE SAÚDE COIMBRA



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BACKGROUND

Tumor recurrence after liver transplant (LT) has been associated with several factors, including ischemia-reperfusion injury (IRI).

Hypothermic oxygenated perfusion (HOPE) reduces IRI and downstream inflammation.

Studies suggest a decreased recurrence rate of hepatocellular carcinoma (HCC) in grafts undergoing HOPE.

AIM

To study tumor recurrence in HCC transplanted patients with grafts perfused with HOPE.

METHODS

- Retrospective analysis
- HCC adult patients
 - 100% DBD donors
 - LT between 8/2020 - 10/2023: same team; Piggyback; same preservation solution (Celsior®)
 - Two groups:
 - Group 1: without HOPE
 - Group 2: HOPE

Perfusion

- VitaSmart ® – MEDICA
- Belzer MPS ®
- Portal Vein – minimum 120'
- Maximum pressure – 3 mmHg
- Maximum flow – 250 ml/min

Oxygenation

- PaO₂ 450 mmHg

Temperature

- 4-10°C



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RESULTS

n=76	Without HOPE n=24	HOPE n=52	p
Sex (male)	23 (95.8%)	48 (92.3%)	1.000
Age (years)	61 (IQR 56-66)	62 (56.25-66.75)	0.618
MELDNa	12 (IQR 10-18.75)	12 (IQR 9-18.5)	0.302
Preoperative AFP (ng/dL)	4.65 (IQR 2.15-7)	5.1 (IQR 2.85-12)	0.175
Number of nodules	1 (IQR 1-3)	2 (IQR 1-3)	0.452
Largest nodule (cm)	2.5 (IQR 1.6-3.5)	2.7 (IQR 2.13-4.15)	0.234
Milan Out	6 (25%)	19 (36.5%)	0.320
Microvascular invasion	6 (25%)	23 (44.2%)	0.095
Differentiation (G2/G3)	17 (70.8%)	42 (80.8%)	0.220
Metroticket	72.9 (IQR 54.8-75.1)	68.9 (IQR 49.3-72.4)	0.067

n=76	Without HOPE n=24	HOPE n=52	p
Donors' age	58.5 (IQR 54.25-67.75)	73 (IQR 68.25-79)	<0.001
Donors >80 years	0%	23.1%	0.014

n=76	Without HOPE n=24	HOPE n=52	p
Total ischemia time (min)	321.5 (IQR 275-385.5)	248.5 (IQR 211.75-297.25)	<0.001
Cold ischemia time(CIT) HOPE time	283.5 (IQR 241.75-336.25)	220.5 (IQR 185.5-255) 132.5 (IQR 123-173.5)	<0.001
IRI	20 (83.3%)	29 (55.8%)	0.255
- Mild	4 (20%)	17 (58.6%)	0.001
- Moderate	8 (40%)	12 (41.4%)	
- Severe	8 (40%)	0	
		Missing: 2 (8.3%)	

Without HOPE

- Follow-up 45 months (IQR 22-50.75)
- Mortality n= 4 (16.7%)
- DFS at one year: 95.8%
- Recurrence n= 2 (8.3%)
→ Mortality 100%
- Liver and bone
- Liver, peritoneal and bone

HOPE

- Follow-up 29.50 months (IQR 23.25-37)
- Mortality n= 6 (11.5%) (p=0.539)
No mortality due to disease recurrence
- DFS at one year: 98% (p=0.913)
- 23.1% with Metroticket ≤50%: only 1 recurrence
- Recurrence n= 4 (7.7% (p=1.000)
 - Adrenal and pulmonary
 - Peritoneal (2)
 - Pulmonary

CONCLUSIONS

- appears to reduce hepatic recurrence after LT for HCC and the consequent mortality;
- allowed the use of grafts from donors aged ≥80 years old, improving access to LT for these patients;
- significantly reduced the CIT and IRI severity.