grupo brasileiro
de tumores
gastrointestinais

Associating Liver Partition and Portal Vein Ligation for Staged hepatectomy

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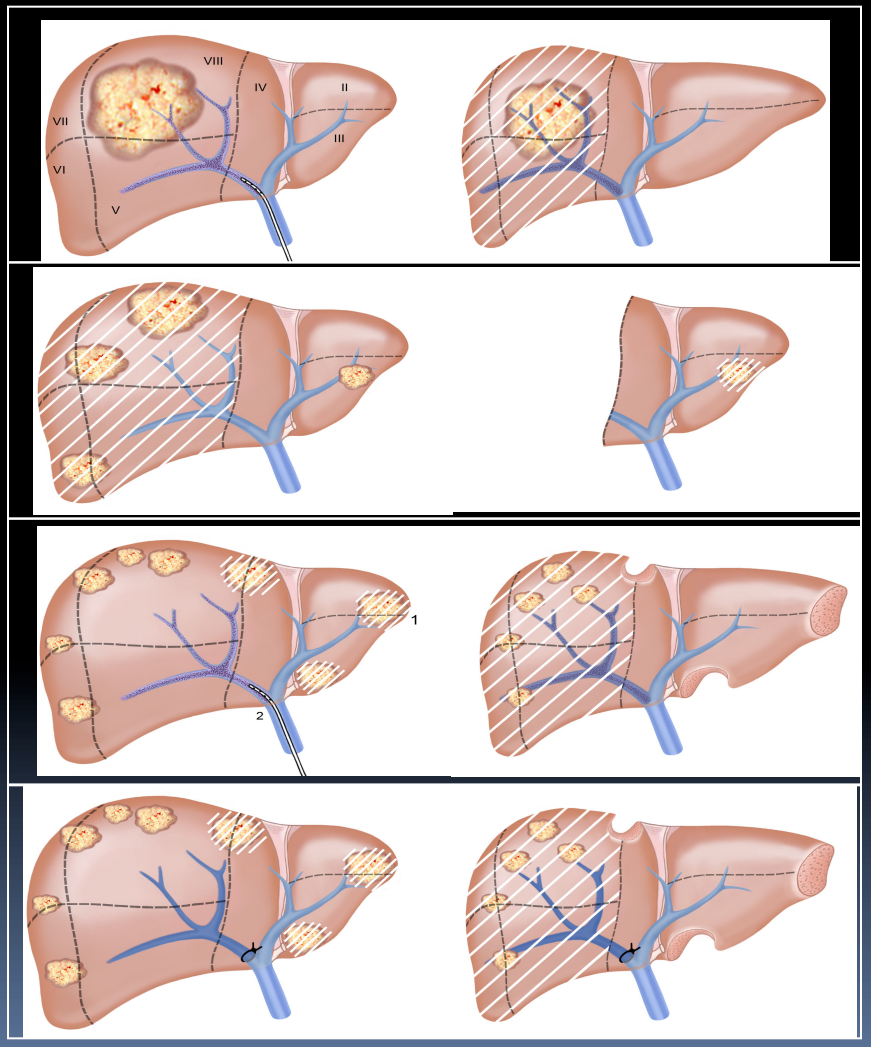
Indução de Hipertrofia

Embolização Portal (EP)
Makuuchi M, et al. *Surgery 1990*

Hepatectomia em 2 tempos
Adam R, et al. *Ann Surg. 2000*

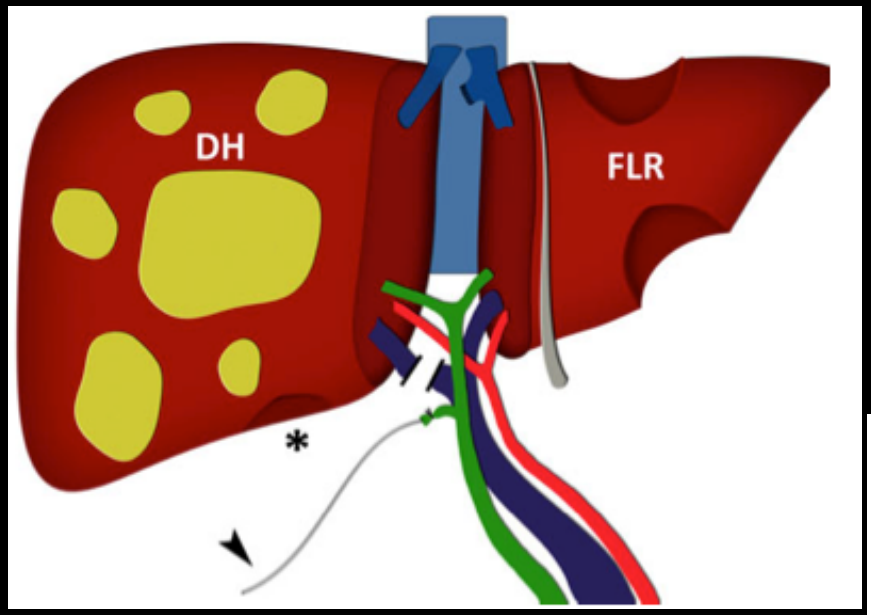
Hepatectomia 2 tempos + EP
Jaeck D, et al. *Ann Surg. 2004*

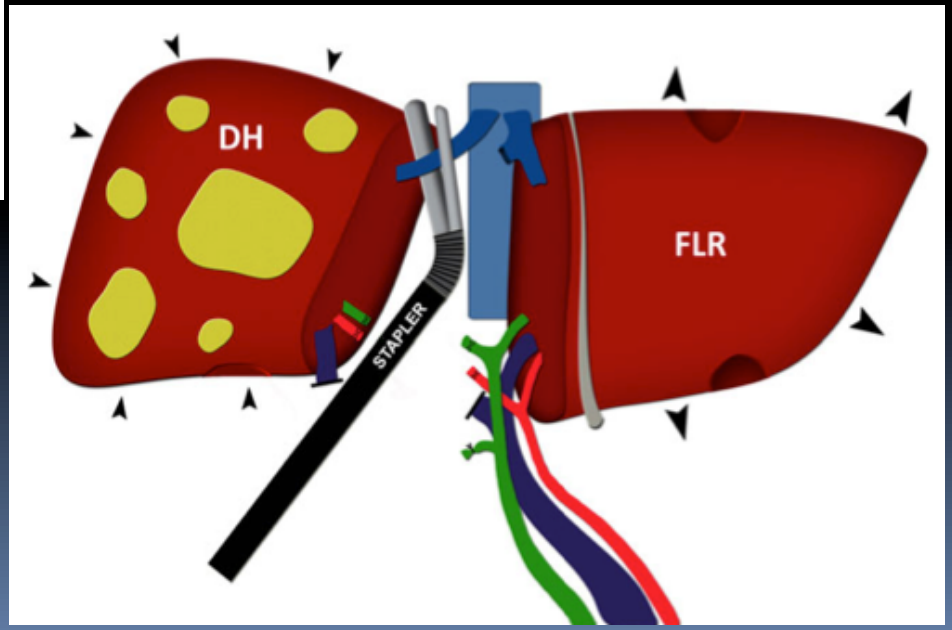
Hepatectomia 2 tempos + LP
J Belghiti, Clavien AP, et al. *Hepatology 2008*



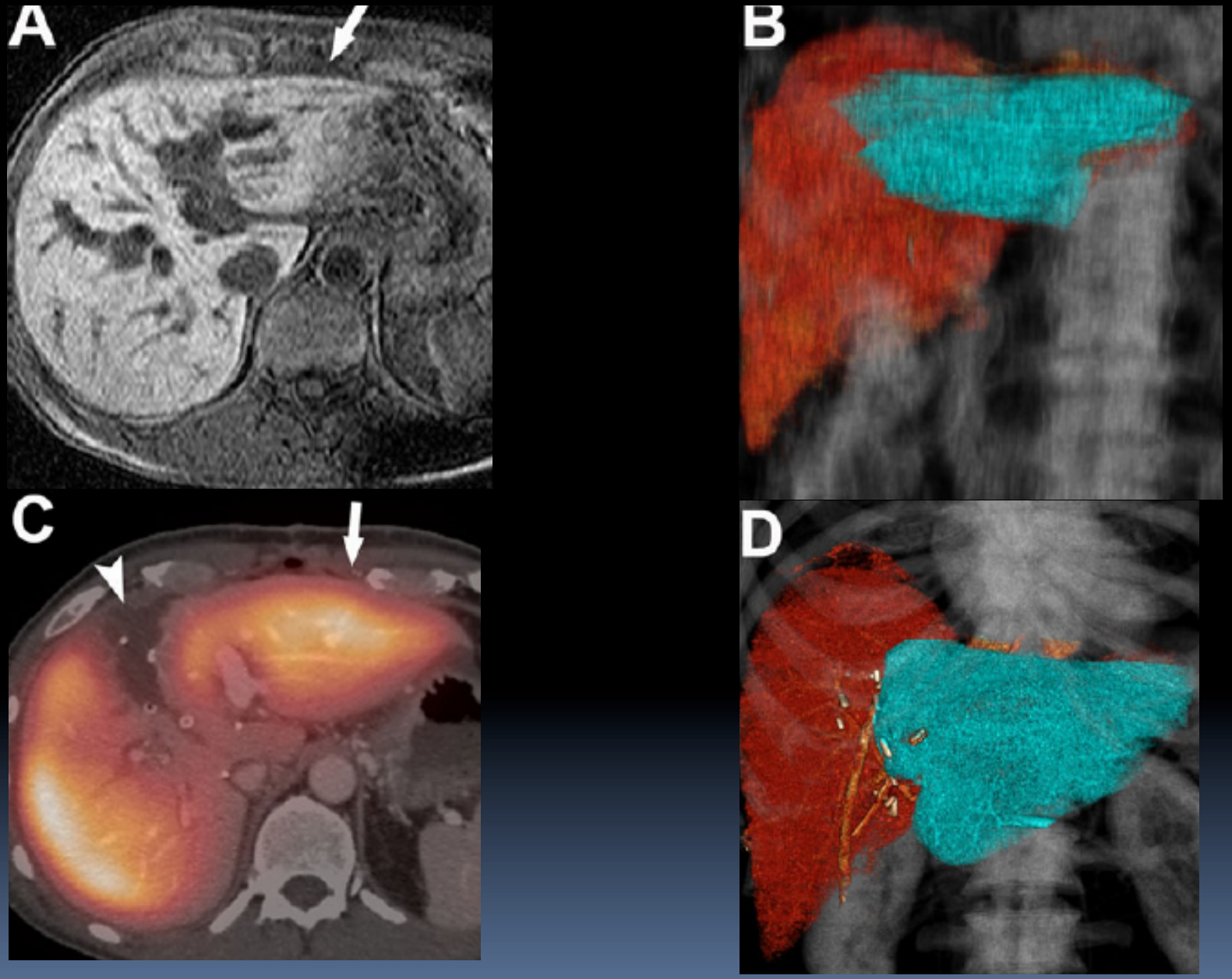
Aspectos técnicos

ALPPS





Ardiles V, et al. In Torres OJM. Ed Rubio. In Press



de Santibanes E, et al. World J Surg 2012;36:125-8

ALPPS

major advances to surgically induce fast liver hypertrophy. The rapid worldwide adoption of ALPPS, after being described in Germany, has resulted in preliminary single center and cooperative experiences showing a high morbidity and mortality of this emerging method. In the large multicenter experiences reported, the Brazilian[16] with 39 patients and the German[9] with 25 patients, a morbidity of 59% to 68% and a mortality of 12% to 12.8% were reported. Proponents of PVE argue that the ALPPS has excessively high morbidity and mortality rates. However, the recently reported data from 87 patients who underwent a major hepatectomy after chemotherapy and PVE or PVL at the Beaujon Hospital in France for initially unresectable

Cortesia Dr. Eduardo de Santibanes (Buenos Aires – Argentina)

Alvarez FA et al. Ann Surg. In Press.

Factibilidade (Completar resecção R0)

ALPPS vs Cirurgia em dois tempos

Author	Year	N° patients	Completed 2nd Stage	Resectability
Lamb *et al* (Systematic review)[1]	2013	459	352 patients	**76%**
Abbot *et al* (MD Anderson)[2]	2013	82	56 patients	**68%**
Cardona *et al* (MSKCC)[3]	2013	40	35 patients	**88%**
Tsai *et al* (J Hopkins)[4]	2010	45	35 patients	**78%**
Belghiti J (Beaujon)[5]	2008	35	26 patients	**74%**
Adam *et al* (Paul Brousse)[6]	2008	59	41 patients	**69%**
Torres et al (Brazil)[7]	2013	39	37 patients	**94,9%**
ALPPS Registry[8]	2013	202	197 patients	**98%**

[1] Lamb *et al.* HPB 2013
[2] Abbot *et al.* J Surg Oncol. 2013
[3] Cardona *et al*. Ann Surg Oncol. 2013
[4] Tsai *et al*. HPB 2010
[5] Belghiti J *et al*. J Gastrointest Surg. 2008
[6] Adam *et al.* Ann Surg. 2008
[7] Torres et al. ABCD 2013
[8] Schdde et al. Annals of surgery 2014

SEGURANÇA

Author	Year	N° patients	Morbidity (major)	Liver Failure	Mortality
Lamb *et al* (Systematic review)[1]	2013	459	40%	-	3%
Cardona *et al* (MSKCC)[2]	2013	40	45%	-	0%
Brouquet *et al* (MD Anderson)[3]	2011	65	29%	5%	6.4%
Tsai *et al* (J Hopkins)[4]	2010	45	28%	8.6%	8.8%
Belghiti J (Beaujon)[5]	2008	35	46%	15%	0%
Adam *et al* (Paul Brousse)[6]	2008	59	59%	22%	7%
ALPPS Registry (CRLM)[7]*	2013	202	38%	6%	8%

[1] Lamb *et al.* HPB 2013
[2] Cardona *et al*. Ann Surg Oncol. 2013
[3] Brouquet *et al.* J Clin Oncol 2011
[4] Tsai *et al*. HPB 2010
[5] Belghiti J *et al*. J Gastrointest Surg. 2008
[6] Adam *et al.* Ann Surg. 2008
[7] www.alpps.net

Resultados oncológicos a curto prazo

Author	Year	Nº patients	OS		DFS	
			1 yr	2yr	1yr	2yr
Lamb *et al* (Systematic review)[1]	2013	459	-	-	-	-
Tsai *et al* (J Hopkins)[2]	2010	45	88%	74%	85%	68 %
Brouquet *et al* (MD Anderson)[3]	2011	65	89%	80%	39%	-
Adam et al (Paul Brousse)[4]	2008	41	87%	76%	60%	40 %
ALPPS Registry (CRLM)[5]	2013	141	88%	74%	59%	41%

[1] Lamb *et al* HPB. 2013

[2] Tsai *et al*. HPB 2010

[3] Brouquet *et al.* J Clin Oncol 2011

[4] Adam *et al.* Ann Surg. 2008

[5] Schadde et al. Annals of Surgery 2014

O procedimento ALPPS é factível, seguro e com resultados oncológicos semelhantes aos procedimentos semelhantes com a mesma finalidade.

Article:ANNSURG-D-14-01138 **Date:**October 15, 2014 **Time:** 14:35

ORIGINAL ARTICLE

Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy Offers High Oncological Feasibility With Adequate Patient Safety

A Prospective Study at a Single Center

Fernando A. Alvarez, MD, Victoria Ardiles, MD, Martin de Santibañes, MD, Juan Pekolj, MD, PhD, and Eduardo de Santibañes, MD, PhD

Cortesia Dr. Eduardo de Santibanes (Buenos Aires – Argentina)

Alvarez FA, et al. Ann Surg 2014

TABLE 1. Baseline characteristics of the study population

Variable	Patients (n= 30)
Age/ yrs, median (range)	58.6 (35-81)
Sex/ male, n° (%)	19 (63)
BMI (kg/m^2), median (range)	25.2 (17.7-31.7)
ASA operative risk, n° (%)	
< 3	22 (73)
≥ 3	8 (27)
Charlson Index, median (range)	7 (2-10)
Tumor type, n° (%)	
Colorectal liver metastases	19 (63.3)
Neuroendocrine metastases	3 (10)
Hepatocellular carcinoma	3 (10)
Hilar cholangiocarcinoma	1 (3.3)
Lobar cholangiocarcinoma	1 (3.3)
Other*	3 (10)
Bilateral disease, n° (%)	19 (63)
Colorectal liver metastases	15
Neuroendocrine metastases	3
NCRNNE	1
Chemotherapy, n° (%)	18 (60)
≥ 6 cycles	13
≥ 2 lines	6
Targeted therapy	12
Diseased parenchyma, n° (%)	14 (46.6)
Chemotherapy-induced	11
Non chemotherapy-induced	3
Previous abdominal intervention, n° (%)	19 (63)
Synchronous primary tumor, n° (%)	9 (30)
% FLR/TLV, mean (s.d.)	22.1 (6.1)
% FLR/BW (cc/kg), mean (s.d.)	0.47 (0.14)

ASA, American Society of Anesthesiologists; BMI, body mass index; NCRNNE, non-colorectal non-neuroendocrine metastases; FLR, future liver remnant; TLV, total liver volume; BW, body weight.

* Metastatic breast cancer (n= 1), metastatic leiomyosarcoma (n= 1), metastatic esophageal cancer (n= 1).

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TABLE 2. Intraoperative data in 30 patients treated.

Characteristic	1st Stage	2nd Stage
Type of major liver resection, n° (%)		
Right hepatectomy	-	8 (27)
Right trisectionectomy		21 (70)
Left trisectionectomy	-	1 (3)
FLR clean-up, n° (%)	19 (63)	0
Lesions resected, median (range)	2 (1-20)	
Extrahepatic procedures, n° (%)	11 (37)	0
Colorectal resection	4	-
Colorectal resection + RYH	1	-
RYH	1	-
Small bowel resection	1	-
Distal spleno-pancreatectomy	1	-
Distal spleno-pancreatectomy + LRN	1	-
Colostomy	1	-
Diaphragmatic resection	1	-
Operative time (min), median (range)	315 (160-480)	120 (60-300)
Intermittent Pringle maneuver, n° (%)	9 (30)	0
Duration (min), median (range)	29 (7-50)	-
Plastic bag used, n° (%)	15 (50)	
RBC transfusion *, n° (%)	8 (26.6)	13 (43.3)
Packs per patient, median (range)	2 (1-4)	2 (1-4)
Portal pressure (mmHg), n° (%)	9 (30)	3 (10)
Baseline, median (range)	12 (7-18)	15 (13-17)
After PV ligation, median (range)	15 (12-21)	-
After RHA clamping, median (range)	18 (12-23)	15 (13-17)
R0 resection †, n° (%)	19 (100)	27 (93.1)

FLR, future liver remnant, RHY, roux-en-Y hepaticojejunostomy; LRN, left radical nephrectomy; RBC, red blood cells; PV, portal; vein; RHA, Right hepatic artery.

* Three patients received blood transfusion during both stages.

† 1st stage= % in patients with FLR clean-up. 2nd stage= % in patients who completed the strategy.

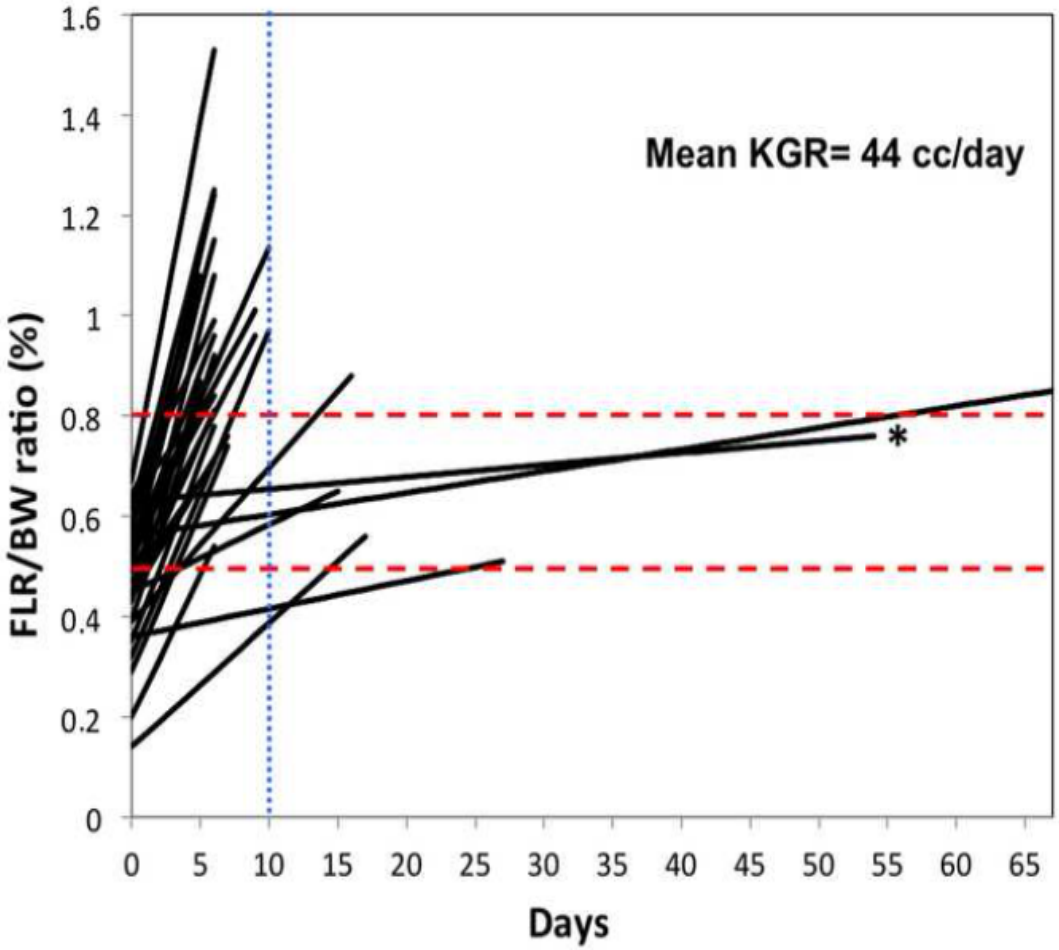

FIGURE 2. Volumetric increase in terms of FLR to BW ratio in all patients treated. As observed, only 6 patients did not reach a sufficient hypertrophy within 10 days of the interval period (*blue dashed line*). The *red dashed lines* indicate the critical FLR/BW ratios for safe liver surgery of 0.5% and 0.8% respectively. *In this patient the FLR/total liver volume ratio was 35% and the sectorial FLR function by scintigraphy was 41% of the overall liver function before reoperation.

24 pacientes alcançaram o volume hepático necessário em 10 dias

A media de hipertrofia foi de 89% em 6 dias

TABLE 4. Postoperative morbidity according to severity grade*

Stage	Grade[24]	Number	Event (n)
1st	I	2	Acute renal insufficiency (2)
	II	3	Pancreatic fistula (2)
			Catheter-related infection (1)
	IIIa	2	Intra-abdominal collection (2)
	IIIb	4	Abdominal pain (2)
			Reduced portal flow (1)
			Portal vein thrombosis (1)
	IVa	1	Acute renal insufficiency (1)
	IVb	1	Intra-abdominal hemorrhage (1)
	V	1	Multi-organ failure (1)
2nd	I	5	PHLF/ Grade A (3)
			Acute renal insufficiency (2)
	II	1	Intra-abdominal hemorrhage (1)
	IIIa	3	Pleural effusion (3)
	IIIb	4	Biliary fistula (4)
	IVa	1	PHLF/ Grade B (1)
	IVb	1	Pneumonia (1)
	V	1	Multi-organ failure (1)

PHLF, posthepatectomy liver failure.
* A total of 30 events were recorded in 16 patients, 10 of which occurred in 2 patients who died due to multi-organ failure.

Morbidade: 53%

Mortalidade: 6,6%

39% de complicações >IIIb

TABLE 3. Risk factors associated with a reduced kinetic growth of the future liver remnant.

	KGR<35cc/day	Univariate		Multivariate	
Variables	**Yes, n° (%)**	**OR (95% CI)**	***P***	**OR (95% CI)**	***P***
Age, yr					
≥ 60	6 (50)	5 (0.9-26.8)	0.06	2.7 (0.1-65.3)	0.55
< 60	3 (16.7)				
Sex					
Male	4 (21)	3.1 (0.6-15.8)	0.16		
Female	5 (45.5)				
ASA operative risk					
≥ 3	6 (75)	19 (2.5-141)	0.004	10.3 (0.8-136.8)	0.08
< 3	3 (13.6)				
Charlson Index					
≥ 7	8 (47)	10.6 (1.1-101)	0.039	0.9 (0.04 – 21)	0.93
< 7	1 (7.7)				
BMI, kg/m^2					
≥ 25	4 (25)	0.6 (0.1-2.9)	0.52		
< 25	5 (35.7)				
Chemotherapy					
Yes	4 (22.2)	0.4 (0.1-1.9)	0.26		
No	5 (41.6)				
FLR/TLV, %					
< 20	4 (44.4)	0.4 (0.1-2)	0.26		
≥ 20	5 (23.8)				
Transfusion, 1st stage					
Yes	4 (50)	3.4 (0.6-18.7)	0.16		
No	5 (22.7)				
Extrahepatic procedure					
Yes	3 (27.3)	0.8 (0.1-4.1)	0.8		
No	6 (31.6)				
Pringle use					
Yes	2 (22.2)	0.6 (0.1-3.5)	0.54		
No	7 (33.3)				
Liver partition					
Total	5 (55.6)	5.3 (0.1-29.2)	0.055	5.4 (0.3-106.3)	0.26
Partial	4 (19.1)				
Complication, 1st stage					
Yes	6 (60)	8.5 (1.4-49.5)	0.017	2.9 (0.2-37.1)	0.42
No	1 (5.6)				

OR, odds ratio; CI, confidence interval, ASA, American Society of Anesthesiologists; BMI, body mass index; FLR, future liver remnant; TLV, total liver volume.

Early Survival and Safety of ALPPS

First Report of the International ALPPS Registry

Erik Schadde, MD, FACS, Victoria Ardiles, MD,† Ricardo Robles-Campos, MD,‡ Massimo Malago, MD, FACS,§ Marcel Machado, MD,¶ Roberto Hernandez-Alejandro, MD,‖ Olivier Soubrane, MD,** Andreas A. Schnitzbauer, MD,†† Dimitri Raptis, MD,* Christoph Tschuor, MD,* Henrik Petrowsky, MD, FACS,* Eduardo De Santibanes, MD, PhD, FACS,† and Pierre-Alain Clavien, MD, PhD, FACS*§§; On behalf of the ALPPS Registry Group*

Schadde E, et al. Ann Surg 2014;260:829-38

ALPPS Registry

TABLE 1. Main Characteristics of 202 Patients in the ALPPS Registry

Variable of Interest	All Patients (n = 202)
Age, median (IQR), yr	60 (53–68)
Sex, male/female, number (%)	121/81(60%/40%)
Ethnic origin	
White, n (%)	188 (93)
Asian, n (%)	10 (5)
Other*, n (%)	4 (2)
Tumor type	
CRLM, n (%)	141 (70)
HCC, n (%)	17 (8)
PHCC, n (%)	11 (5)
IHCC, n (%)	8 (4)
NET, n (%)	8 (4)
Gallbladder cancer, n (%)	6 (3)
Others, n (%)	11 (5)
Charlson Index (1–14)†, median (IQR)	8 (6–9)
Histological abnormalities, data available (100%)	n = 150 (100%)
Abnormal liver histology (fibrosis/steatosis/chemotherapy-related changes), n (%)	79 (52)

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ALPPS Registry

Location of ALPPS patients	
Total centers (no. centers registered)	75
Total (no. patients/no. centers)	202/41
Europe (no. patients/no. centers)	136/27
South America (no. patients/no. centers)	43/4
North America (no. patients/no. centers)	13/4
Asia (no. patients/no. centers)	9/5
Middle East (no. patients/no. centers)	1/1
Year in which ALPPS was performed	
2011, n (%)	28 (14)
2012, n (%)	112 (55)
2013, n (%)	62 (30)
Low- and high-volume centers	
<8 procedures, no. patients/no. centers	75/31
≥8 procedures, no. patients/no. centers	127/10

"Data available" refers to the number of patients in the registry with complete information about the respective variable.

*Other include 3 African patients and 1 Indian patient.

†Charlson Index is a validated method to quantify comorbidities.

CRLM indicates colorectal liver metastasis; HCC, hepatocellular carcinoma; IHCC, intrahepatic cholangiocarcinoma; IQR, interquartile range; NET, neuroendocrine tumor; PHCC, perihilar cholangiocarcinoma.

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ALPPS Registry

TABLE 2. Main Operative Characteristics of 202 Patients in the ALPPS Registry

Variable	All Patients (n = 202)
Laparoscopic/robotic ALPPS, n (%)	5 (3)
Type of ALPPS*	
Right hepatectomy ALPPS, n (%)	106 (52)
Right trisectionectomy ALPPS + Sg 1, n (%)	69 (34)
Right trisectionectomy ALPPS − Sg 1, n (%)	17 (8)
Other types†, n (%)	10 (5)
Mean operative time ALPPS stage I, minutes, mean (SD)	327 (±119)
Mean operative time ALPPS stage II, minutes, mean (SD)	156 (±75)
Pringle maneuver, data available	n = 134 (100%)
Performed in n (%) of cases	65 (49)
Cumulative time performed, minutes, median (IQR)	30 (16–45)
CVP, data available	n = 68 (100%)
mm Hg, median (IQR)	5 (3–6)

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Blood loss ALPPS stage I, data available	n = 159 (100%)
<100 mL, n (%)	23 (14)
101–600 mL, n (%)	77 (48)
601–1000 mL, n (%)	35 (22)
>1000 mL, n (%)	24 (15)
Blood loss ALPPS stage II, data available	n = 145 (100%)
<100 mL, n (%)	60 (41)
101–600 mL, n (%)	67 (46)
601–1000 mL, n (%)	10 (7)
>1000 mL, n (%)	8 (6)
RBC transfusion ALPPS stage I	n = 189 (100%)
Patients transfused, n (%)	53 (28)
Units of RBC, median (IQR)	3 (2–4)
RBC transfusion ALPPS Stage II, data available	n = 184 (100%)
Patients transfused, n (%)	44 (24)
Units of RBC, median (IQR)	2 (2–3)

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ALPPS Registry

TABLE 3. Main Postoperative Outcomes of 202 Patients in the ALPPS Registry

Variable	All Patients (n = 202)
Failure to reach stage II, n (%)	5 (2)
30-d mortality, n (%)	5 (2)
In-hospital mortality, n (%)	18 (9)
90-d mortality	
In all patients n (%)	19 (9)
In CRLM, n (%) (no. total CRLM)	11 (8%) (n = 141)
In HCC, n (%) (no. total HCC)	2 (12%) (n = 17)
In PHCC, n (%) (no. total PHCC)	3 (27%) (n = 11)
In IHCC, n (%) (no. total IHCC)	1 (13%) (n = 8)
In NET, n (%) (no. total NET)	0 (0%) (n = 8)
In gallbladder cancer (%) (no. total gallbladder cancer)	2 (33%) (n = 6)
In subgroup ≤60 yr + CRLM, n (%), (no. total)	4 (5.1%) (n = 78)
Highest complication ≥grade IIIa in both stages	
All patients, n (%) (no. total)	80 (40%) (n = 202)
In CRLM group, n (%) (no. total)	51 (36%) (n = 141)
In subgroup ≤60 yr + CRLM, n (%) (no. total)	23 (29%) (n = 78)

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ALPPS Registry

Highest complication ≥grade IIIb in both stages	
All tumor types, n (%)	56 (28%) (n = 202)
In CRLM group, n (%), (no. total)	30 (21%) (n = 141)
In subgroup ≤60 yr + CRLM, n (%) (no. total)	12 (16%) (n = 78)

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ALPPS Registry

TABLE 4. Survival and Disease-Free Survival in 202 Patients in the ALPPS Registry

Patients According to Tumor Type	All Patients (n = 202)
All patients	202
R-status available	n = 185 (100%)
Incomplete resection (R1/R2), n (%)	16 (9)
Median follow-up, mo (IQR)	9 (6–13)
Median survival, mo	25
Survival at 1 yr (patients at risk)	73% (52)
Survival at 2 yr (patients at risk)	59% (5)
Median disease-free survival, mo	14
Disease-free survival at 1 yr (patients at risk)	60% (27)
Disease-free survival at 2 yr (patients at risk)	42% (1)
CRLM, no. patients	141
R-status available	n = 130 (100%)
Incomplete resection (R1/R2), n (%)	12 (9)
Survival at 1 yr* (patients at risk)	76% (41)
Survival at 2 yr* (patients at risk)	62% (6)
Disease-free survival at 1 yr* (patients at risk)	59% (28)
Disease-free survival at 2 yr* (patients at risk)	41% (9)
Subgroup <60 yr + CRLM only, number of patients	78
R-status available	n = 73 (100%)
Incomplete resection (R1/R2), n (%)	6 (8)
Disease-free survival at 1 yr* (patients at risk)	55% (17)

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Subgroup <60 yr + CRLM only, number of patients	78
R-status available	n = 73 (100%)
Incomplete resection (R1/R2), n (%)	6 (8)
Disease-free survival at 1 yr* (patients at risk)	55% (17)
Disease-free survival at 2 yr* (patients at risk)	36% (7)
Survival at 1 yr* (patients at risk)	88% (33)
Survival at 2 yr* (patients at risk)	74% (10)
HCC, no. patients	17
R-status available	n = 15 (100%)
Incomplete resection (R1/R2), n (%)	0
Disease-free survival at 1 yr* (patients at risk)	87% (1)
Survival at 1 yr* (patients at risk)	61% (1)
PHCC, no. patients	11
R-status available	n = 9 (100%)
Incomplete resection (R1/R2), n (%)	2 (22)
Disease-free survival at 1 yr*	NA†
Survival at 1 yr*	NA†
IHCC, no. patients	8
R-status available	n = 7 (100%)
Incomplete resection (R1/R2) in %	1 (14%)
Disease-free survival at 1 yr* (patients at risk)	31% (1)
Survival at 1 yr* (patients at risk)	73% (1)

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ALPPS Registry

IHCC, no. patients	8
R-status available	n = 7 (100%)
Incomplete resection (R1/R2) in %	1 (14%)
Disease-free survival at 1 yr* (patients at risk)	31% (1)
Survival at 1 yr* (patients at risk)	73% (1)
NET, no. patients	8
R-status available	n = 8 (100%)
Incomplete resection (R1/R2), n (%)	1 (13)
Disease-free survival at 1 yr* (patients at risk)	83% (5)
Survival at 1 yr* (patients at risk)	73% (1)
Gallbladder cancer, no. patients	6
R-status available	n = 6 (100%)
Incomplete resection (R1/R2), n (%)	0
Disease-free survival at 1 yr*	NA†
Survival at 1 yr*	NA†

*Cumulative proportion surviving at the time according to Kaplan-Meier estimates.
†Not available: follow-up not long enough to assess.
CRLM indicates colorectal liver metastases; HCC, hepatocellular carcinoma; IHCC, intrahepatic cholangiocarcinoma; IQR, interquartile range; NET, neuroendocrine tumor; PHCC, perihilar cholangiocarcinoma.

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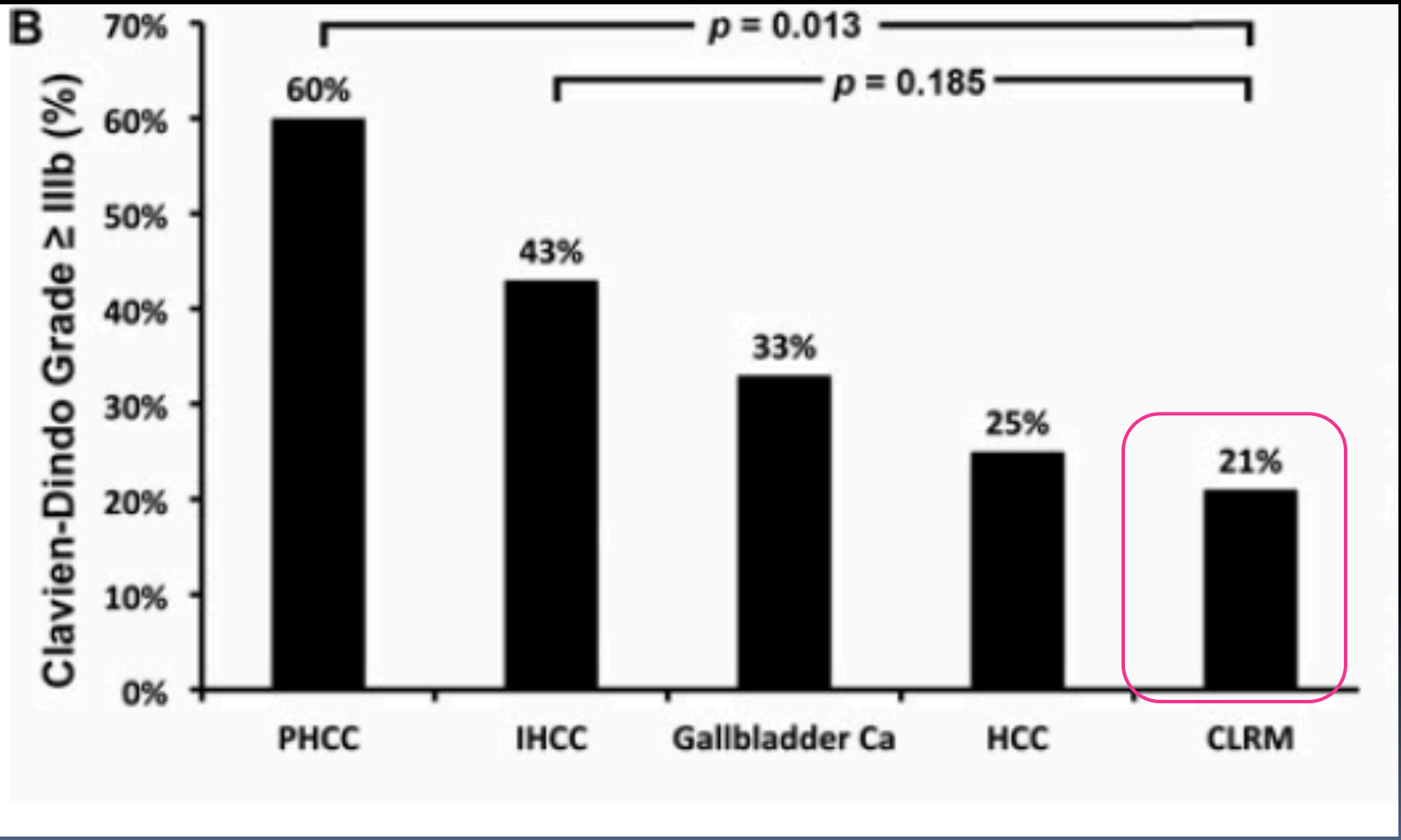
ALPPS Registry



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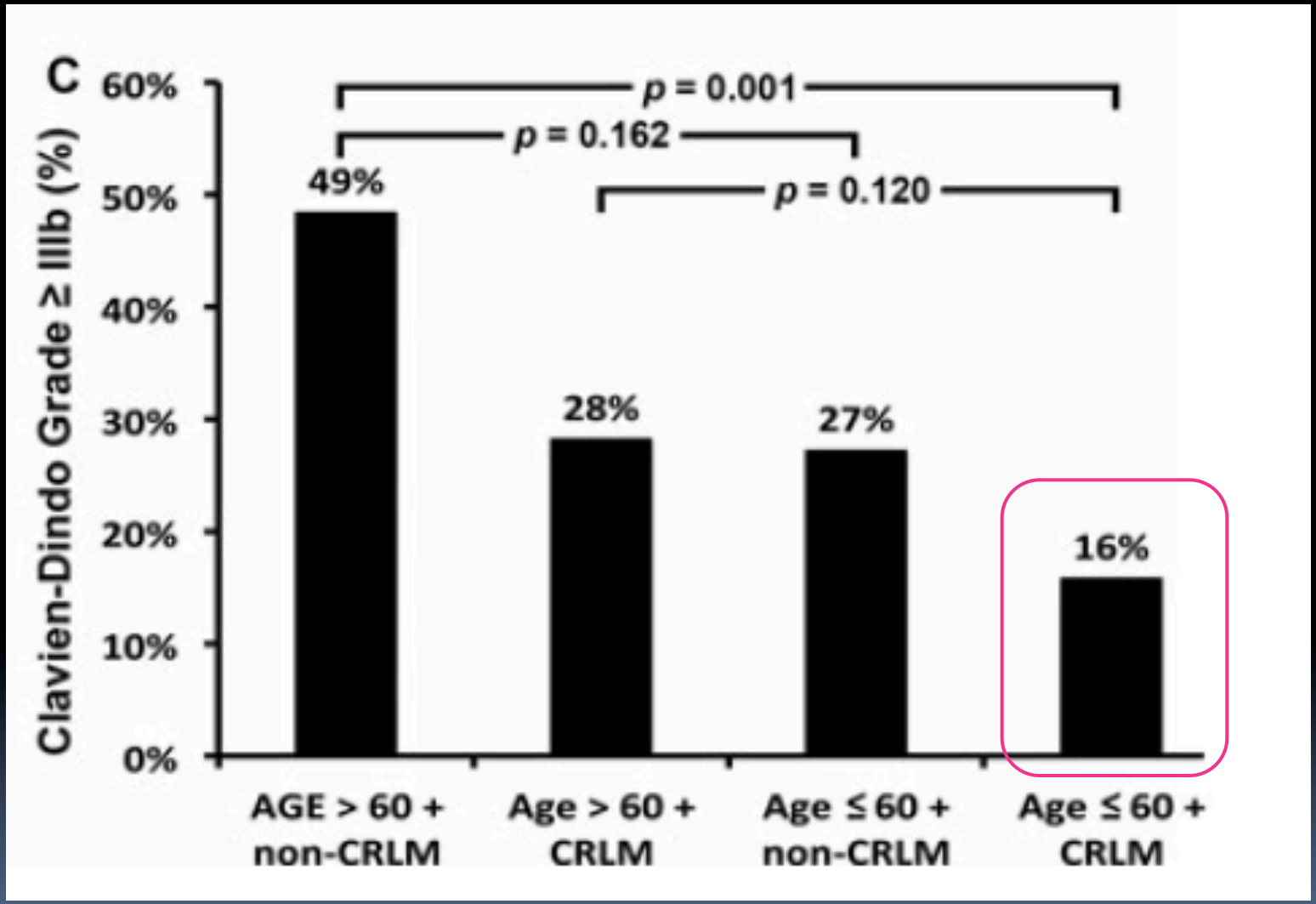
ALPPS Registry



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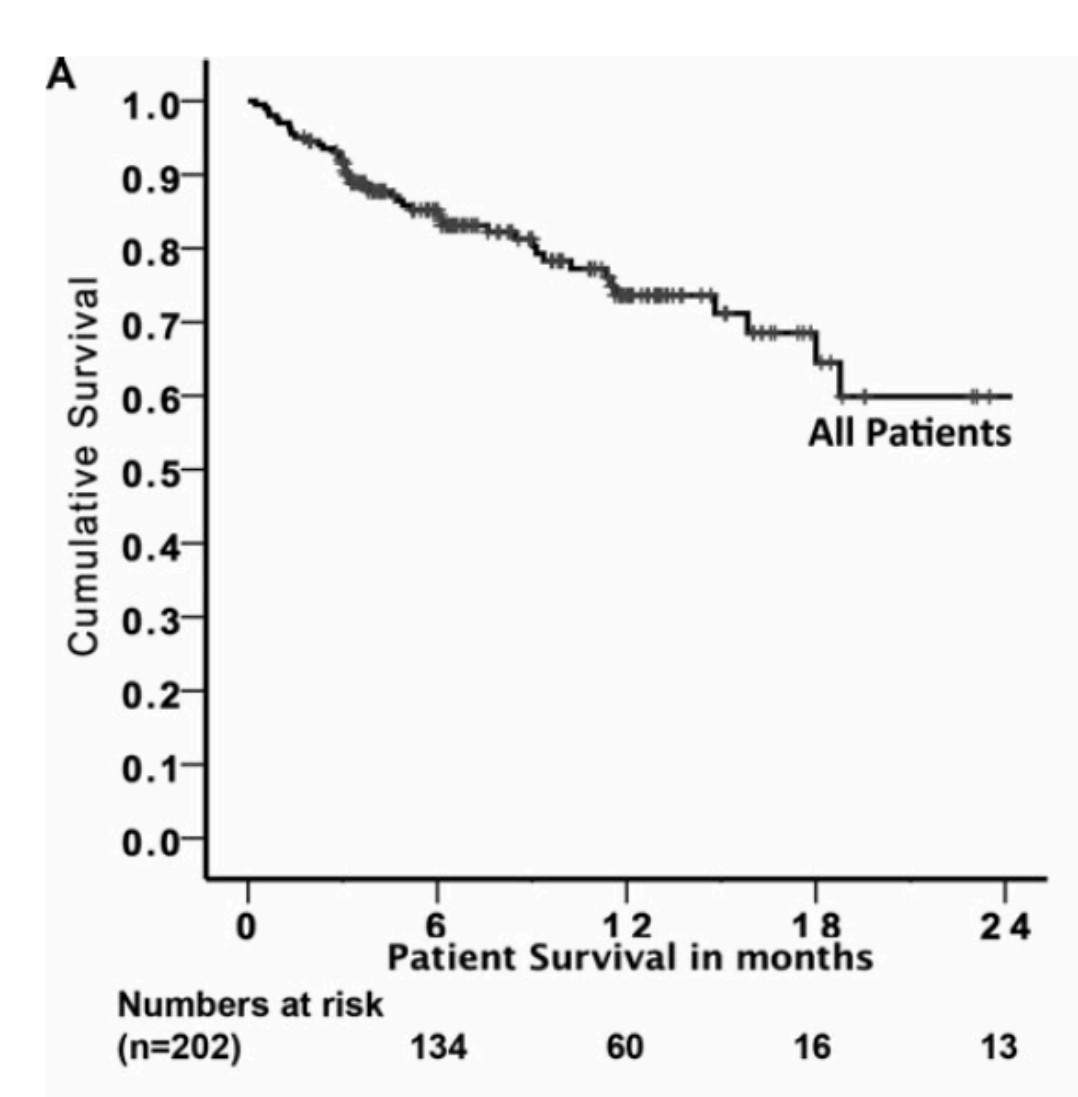
ALPPS Registry



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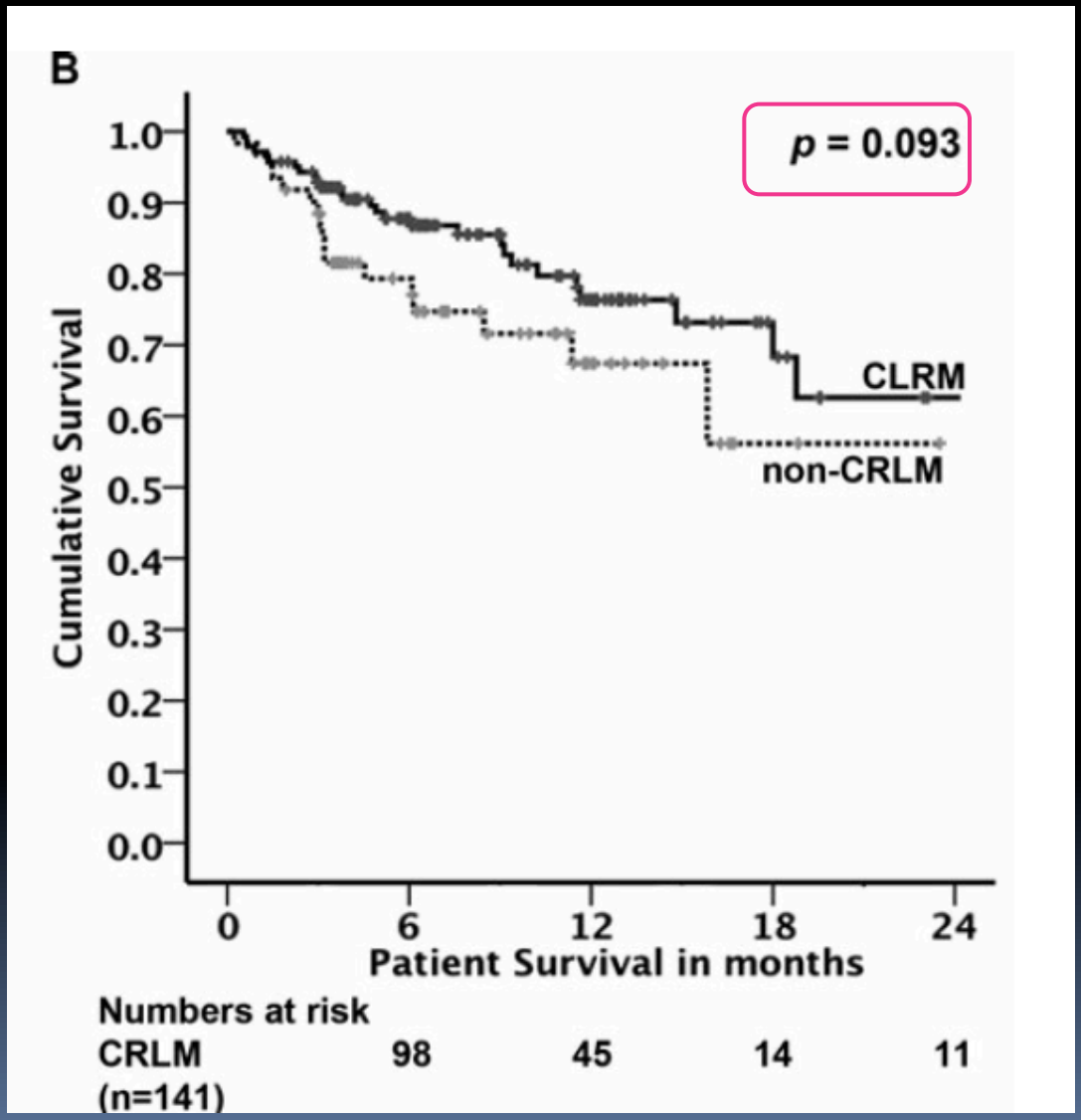
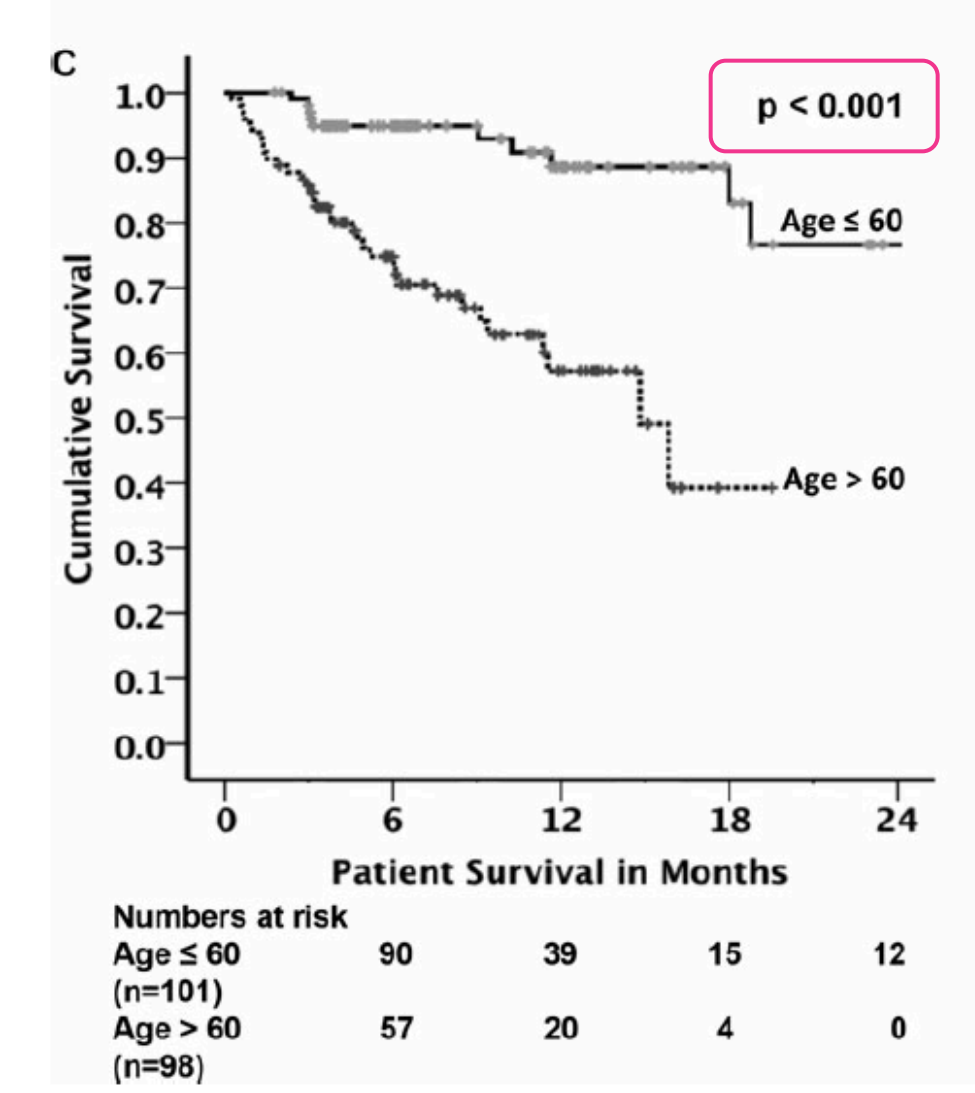
ALPPS Registry



Schadde E, et al. Ann Surg 2014;260:829-38

ALPPS Registry



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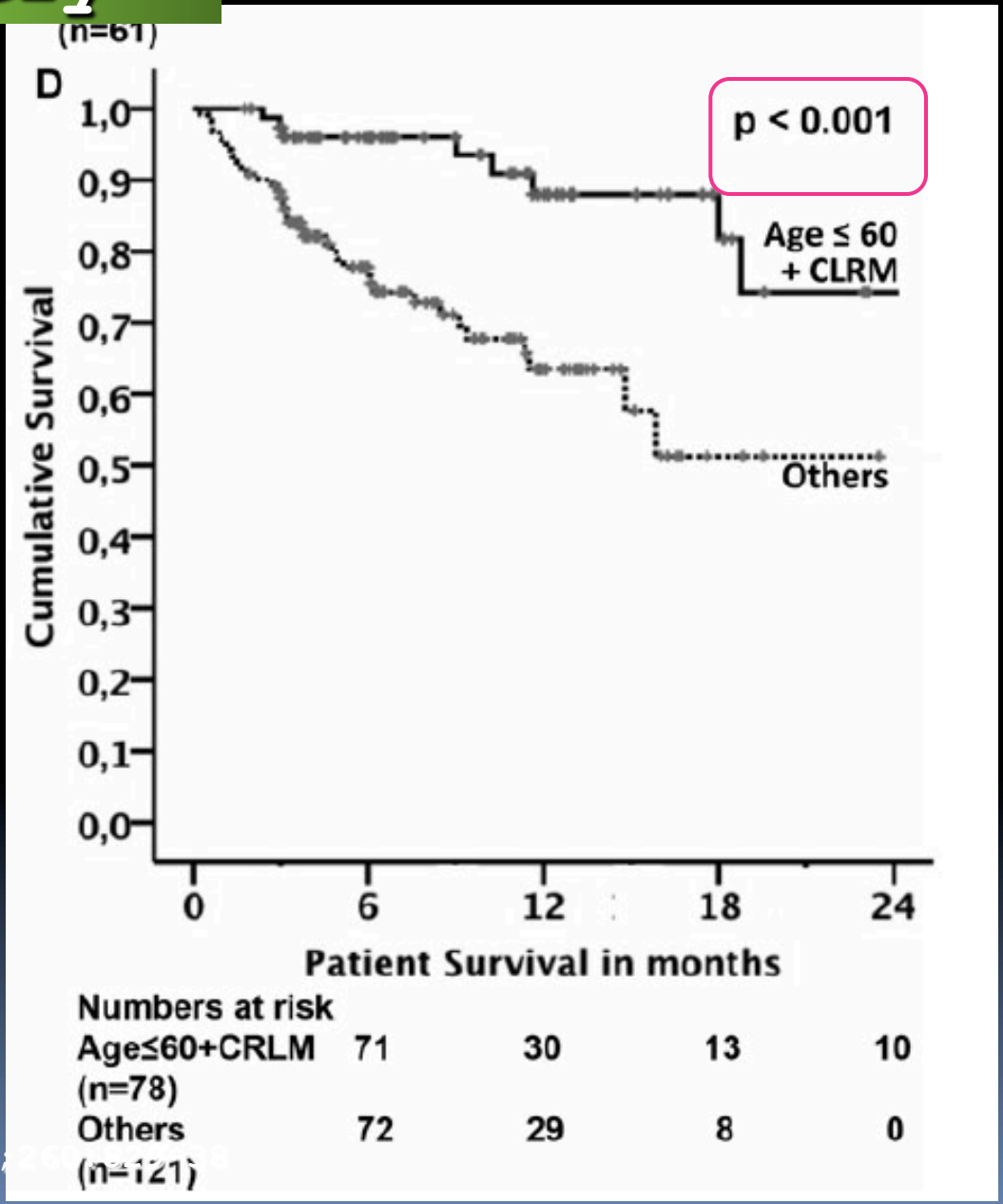

Schadde E, et al. Ann Surg 2014;260:[illegible]

Deve ser indicado no remanescente < 30% ou < 0,5% do peso corporal para fígado sadio (< 40% ou 0,8% em fígados doentes), doença bilobar, fracasso na EVP ou LVP, extensão do tumor inesperada durante a operação e necessidade de hipertrofia > 65%.

Can we improve the morbidity and mortality associated with the associating liver partition with portal vein ligation for staged hepatectomy (ALPPS) procedure in the management of colorectal liver metastases?

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Cortesia Dr. Roberto Hernandez-Alejandro (London-Ontario – Canada)

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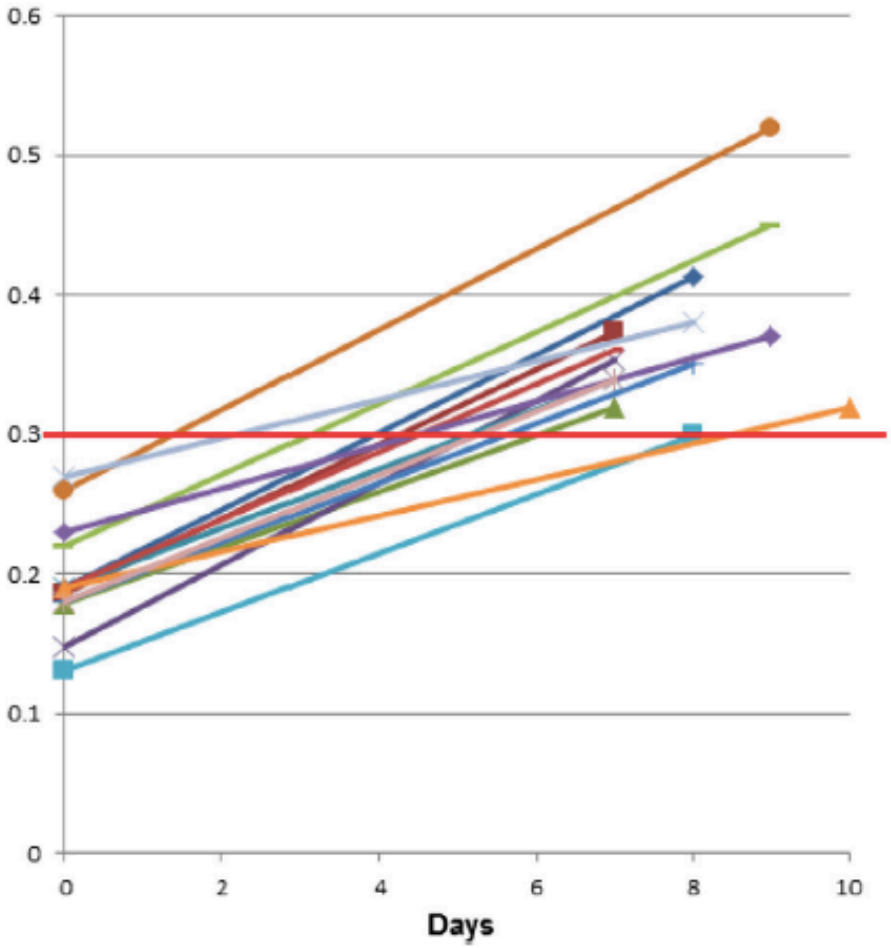

Patient	sFLR0	sFLR1
1	19%	41%
2	19%	37%
3	18%	32%
4	15%	35%
5	19%	34%
6	26%	52%
7	18%	35%
8	19%	36%
9	23%	40%
10	25%	41%
11	13%	30%
12	19%	32%
13	27%	38%
14	17%	34%

Fig. sFLR in ALPPS.

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Table I. Summary table of ALPPS patients

	ALPPS (N = 14)
Age, y	57 (31–66)
Sex, male	9 (64%)
Number of lesions	9 (4–15)
Simultaneous resection	4 (29%)
Reversal approach	2 (14%)
OR time, min, stage 1	385 ± 59
Blood loss, mL, stage 1	725 ± 85
Units of RBC transfused stage 1	0.5 ± 0.8
OR time, min, stage 2	144 ± 41
Blood loss, mL, stage 2	178 ± 80
Units of RBC transfused stage 2	0 ± 0
Any complication	5 (36%)
Severe complications (Clavien-Dindo ≥ IIIB)	2 (14%)
Duration of stay between stages, mean ± SD (median) days	8 ± 1 (8)
Total duration of stay, mean ± SD (median) days	23 ± 12 (18)

ALPPS, Associating liver partition with portal vein ligation for staged hepatectomy; *OR*, operating room; *RBC*, red blood cell.

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Table II. Complications

Patient	*Clavien-Dindo*	*Description*	*50/50 criteria*	*Ascites*	*Prolonged cholestasis*	*R resection*
1	IVA	Liver dysfunction	Yes	Yes	Yes	R0
2a	I	Wound infection	No	No	No	R0
3b	0	N/A	No	No	No	R0
4	0	N/A	No	No	No	R0
5c	IVA	Liver dysfunction, wound dehiscence	Yes	Yes	Yes	R1
6d	IIIA	Abscess requiring drain	No	No	No	R0
7d,e	0	N/A	No	No	No	R1*
8	0	N/A	No	No	No	R0
9	II	Ileus, TPN	Yes	Yes	No	R0
10d	0	N/A	No	No	No	R0
11d	0	N/A	No	No	No	R0
12	0	N/A	No	No	No	R0
13b	0	N/A	Yes	No	No	R0
14	0	N/A	No	No	No	R0

*R0 resection achieved with resection of IVC at second stage.

a = failed previous PVE; b = reversal approach; c = segment 4 ALPPS; d = simultaneous approach; e = vena cava resection during stage 2 of ALPPS involving the region of previous caudate R1 resection.

IVC, Inferior vena cava; *N/A*, not applicable; *TPN*, total parenteral nutrition.

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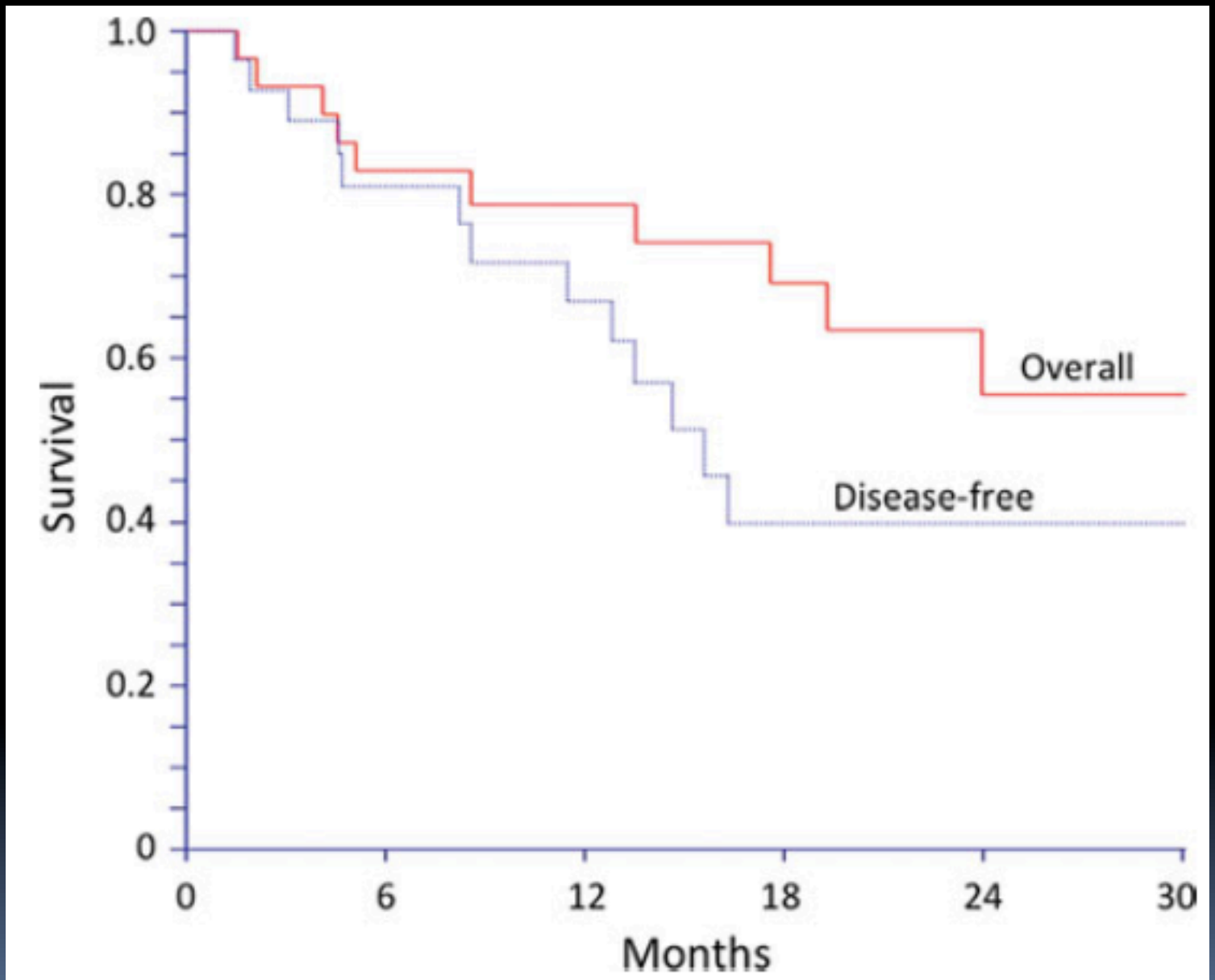

FIGURE 4. DFS and OS of the study population.

Conclusões

O procedimento ALPPS é factível, seguro e com resultados oncológicos semelhantes aos procedimentos semelhantes com a mesma finalidade.

Deve ser indicado no remanescente < 30% ou < 0,5% do peso corporal para fígado sadio (< 40% ou 0,8% em fígados doentes), doença bilobar, fracasso na EVP ou LVP, extensão do tumor inesperada durante a operação e necessidade de hipertrofia > 65%.

O procedimento ALPPS deve ser realizado em pacientes com metástase hepática de origem colo-retal, naqueles com idade igual ou inferior a 60 anos.

Evidência 3
Recomendação C