Organização
Dr. Hugo Gouveia – INCA - RIVOA
Dr. José Hugo Luz – INCA - RIVOA
Dr. Raphael Braz Levigard – RIVOA

31 mar e 1 abr
3º SRio 2023
Simpósio de Radiologia Intervencionista em Oncologia
Hotel Prodigy Santos Dumont • RJ

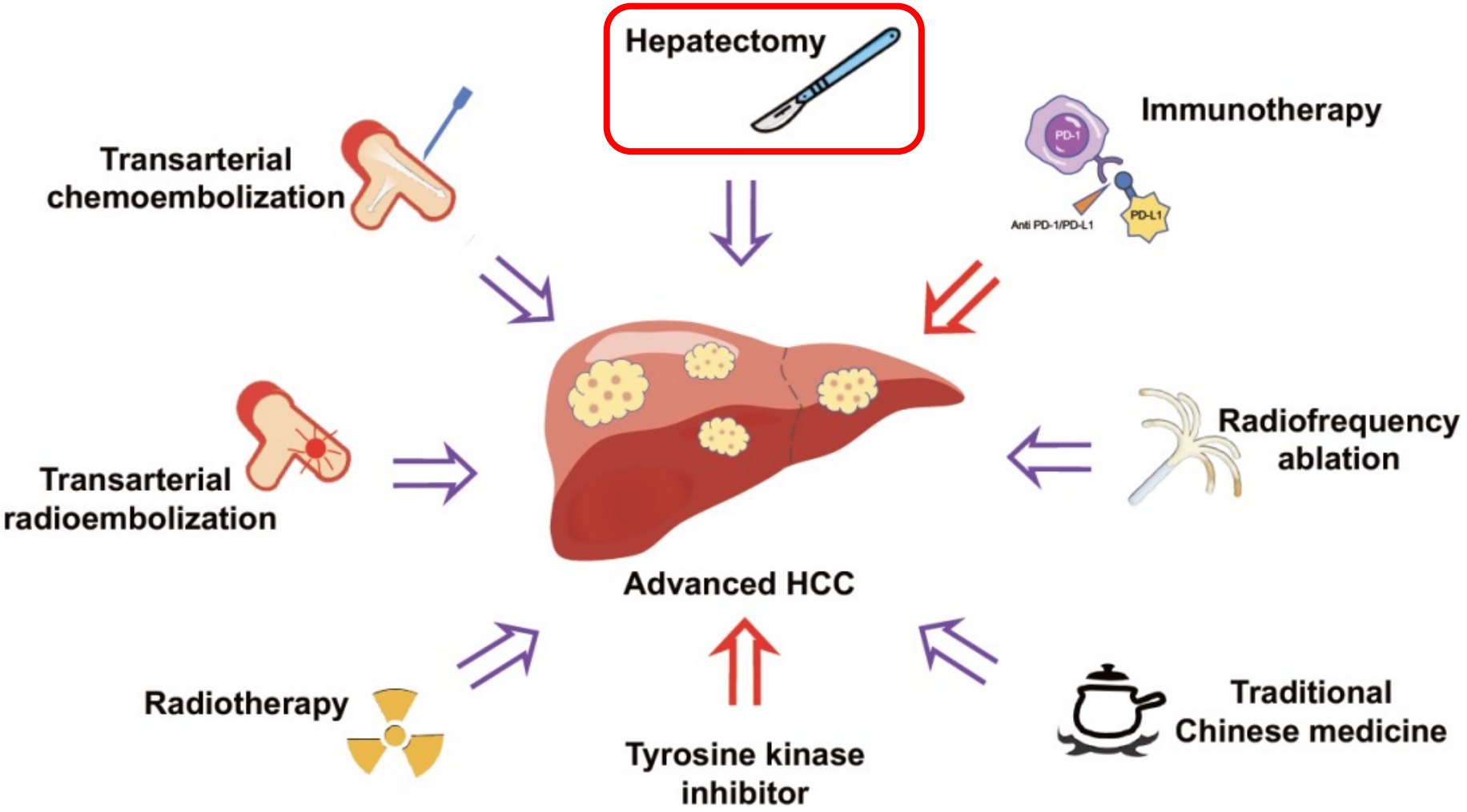
Carcinoma hepatocelular com trombose tumoral portal

Eu trato com cirurgia

Orlando Jorge M. Torres
Professor Titular e Chefe do Serviço de
Cirurgia do Aparelho Digestivo
Unidade Hepatopancreatobiliar
Universidade Federal do Maranhão - Brasil

- ❑ Identificar trombose se beneficia da ressecção
- ❑ Outros fatores relacionados com o prognóstico
- ❑ Recorrência após ressecção
- ❑ Considerar cirurgia minimamente invasiva
- ❑ Considerar outras opções

Carcinoma hepatocellular



Wang J, et al. J BioScience Trends. 2022; 16:405-25

Non-cirrhotic liver

Liver resection

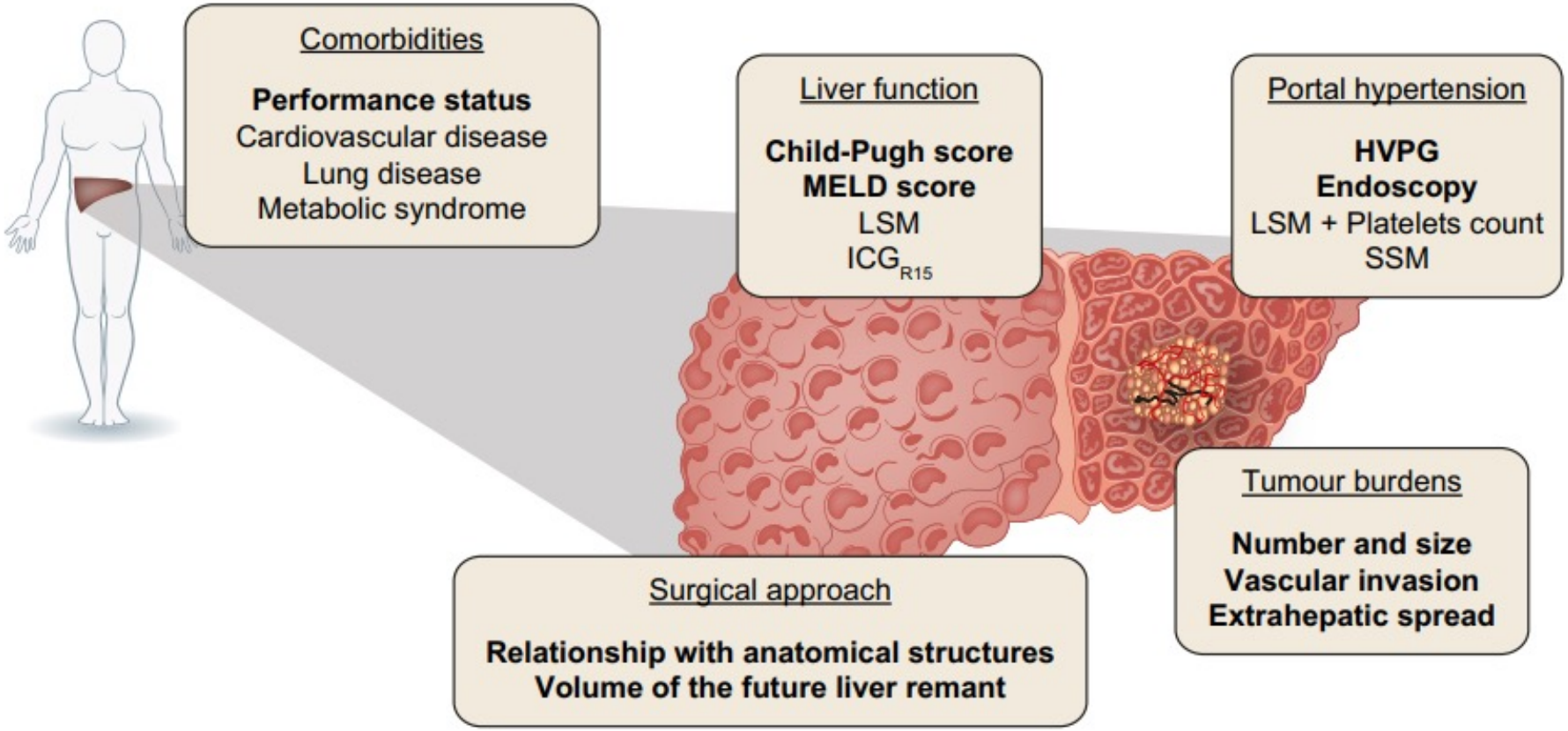
Recommendations

- Surgical resection is recommended as treatment of choice in patients with HCC arising on a non-cirrhotic liver (**evidence low; recommendation strong**).

RESECTION

Galle PR, et al. J Hepatol 2018;69:182-236

- Child-Pugh A
- MELD ≤ 9
- Bilirrubina total <1 mg/dL
- Sem hipertensão porta
- Bom PS
- Extensão da hepatectomia



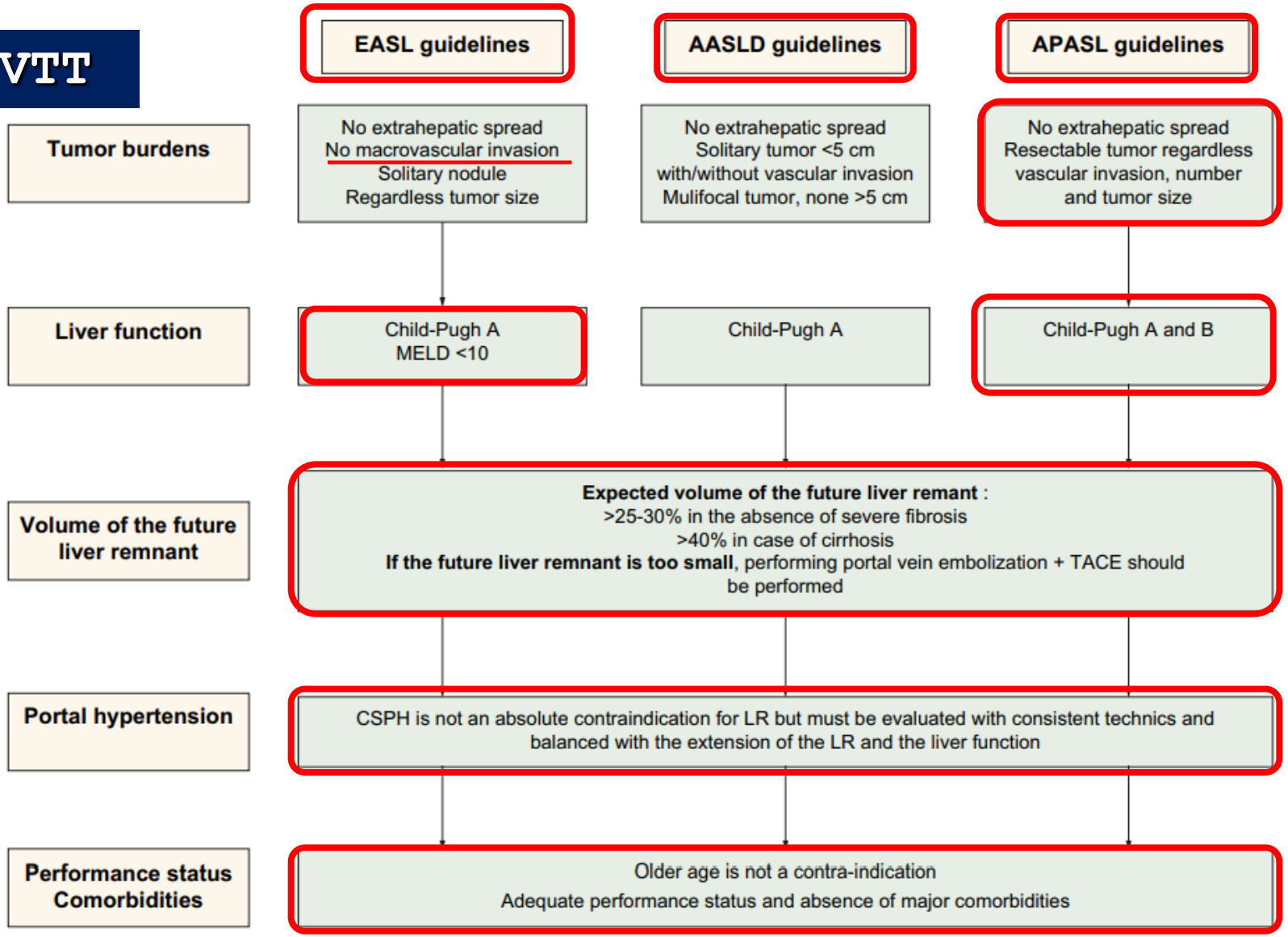
RESECTION

Allaire M, et al. JHEP Reports 2020

European Association for the study of the liver
American Association for the study of liver diseases
Asian Pacific Association for the Study of the Liver

RESECTION

PVTT



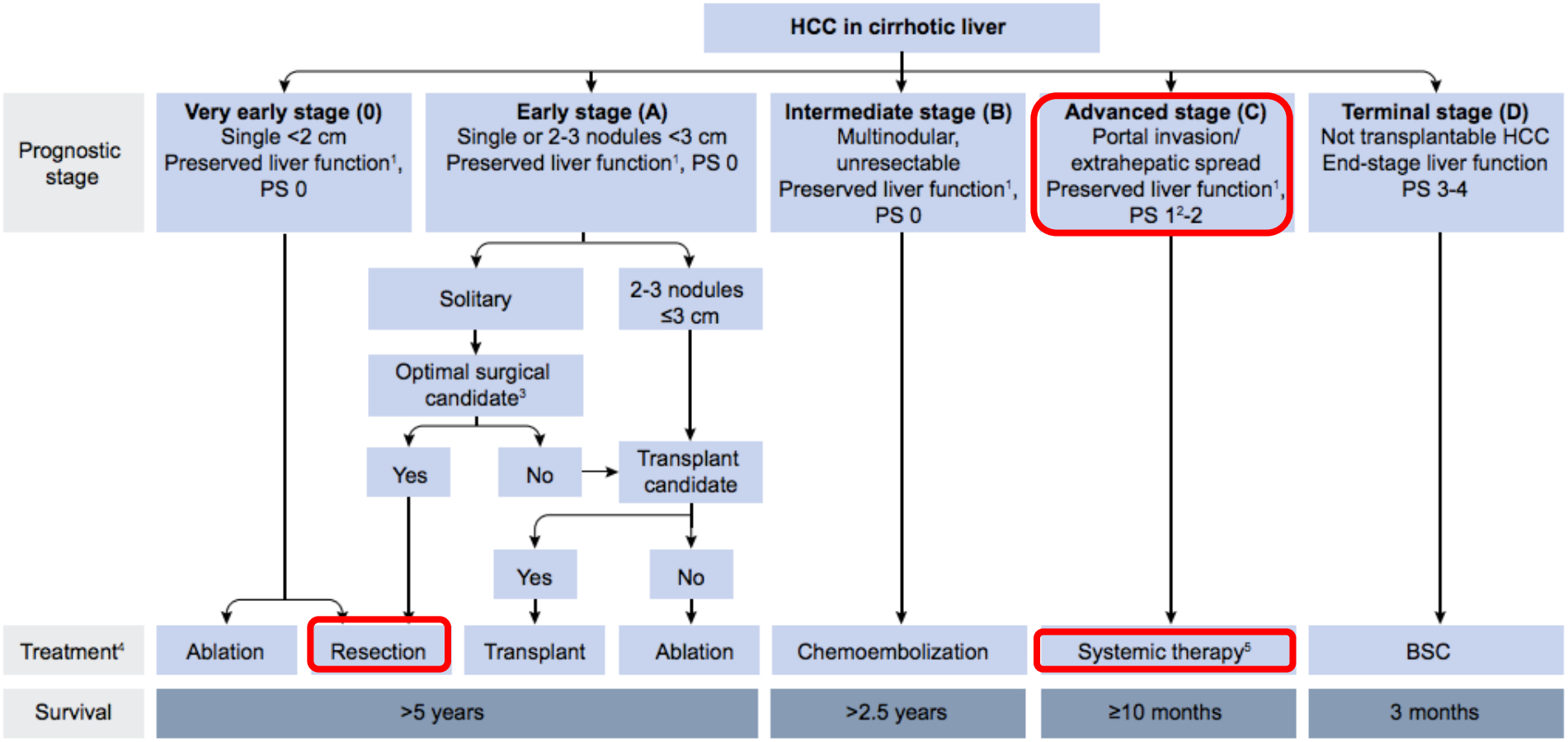
Allaire M, et al. JHEP Reports 2020

Clinical Practice Guidelines

JOURNAL OF HEPATOLOGY

European Association for the study of the liver

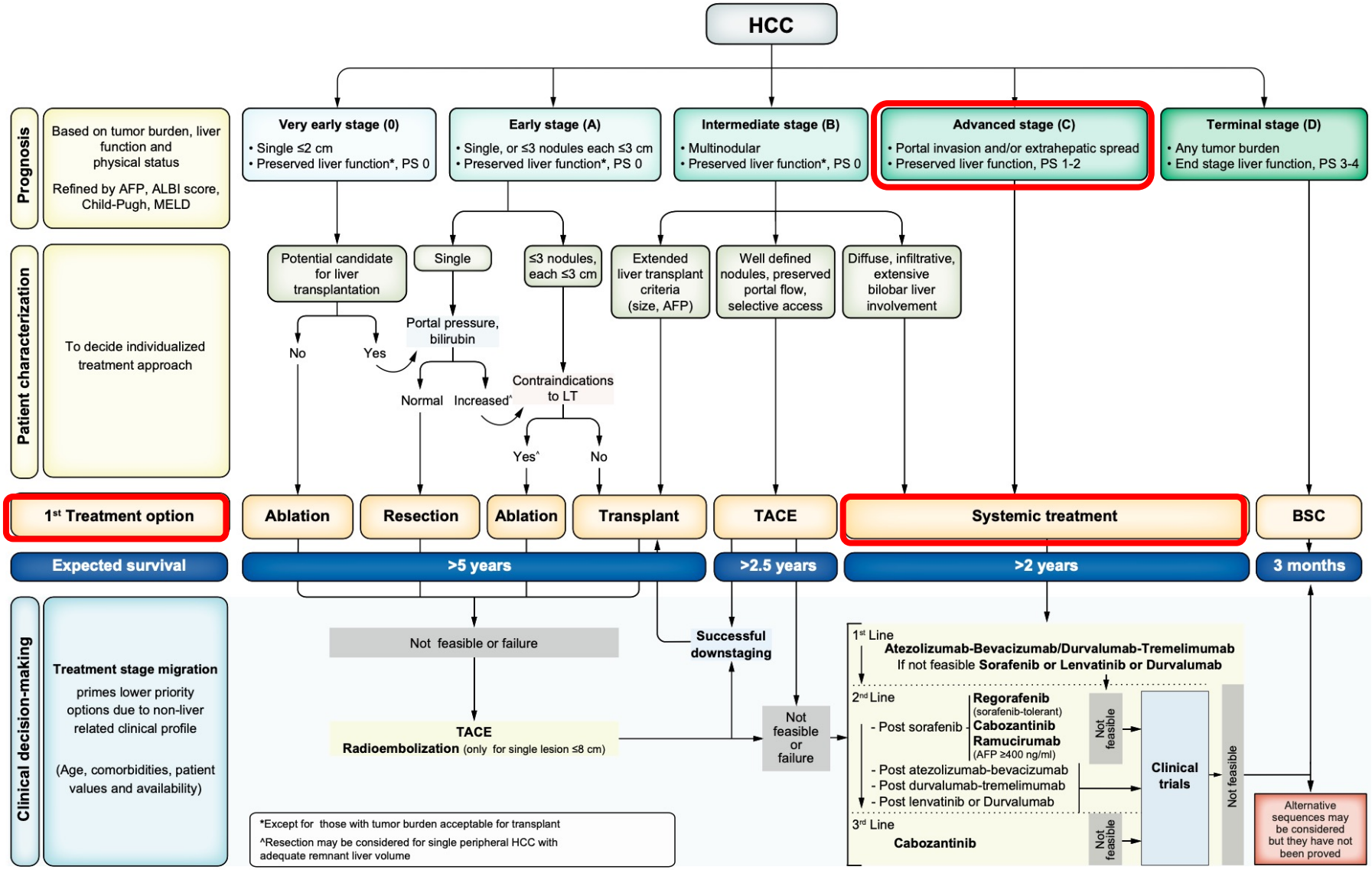
EASL Clinical Practice Guidelines: Management of hepatocellular carcinoma☆



Galle PR, et al. J Hepatol 2018;69:182-236

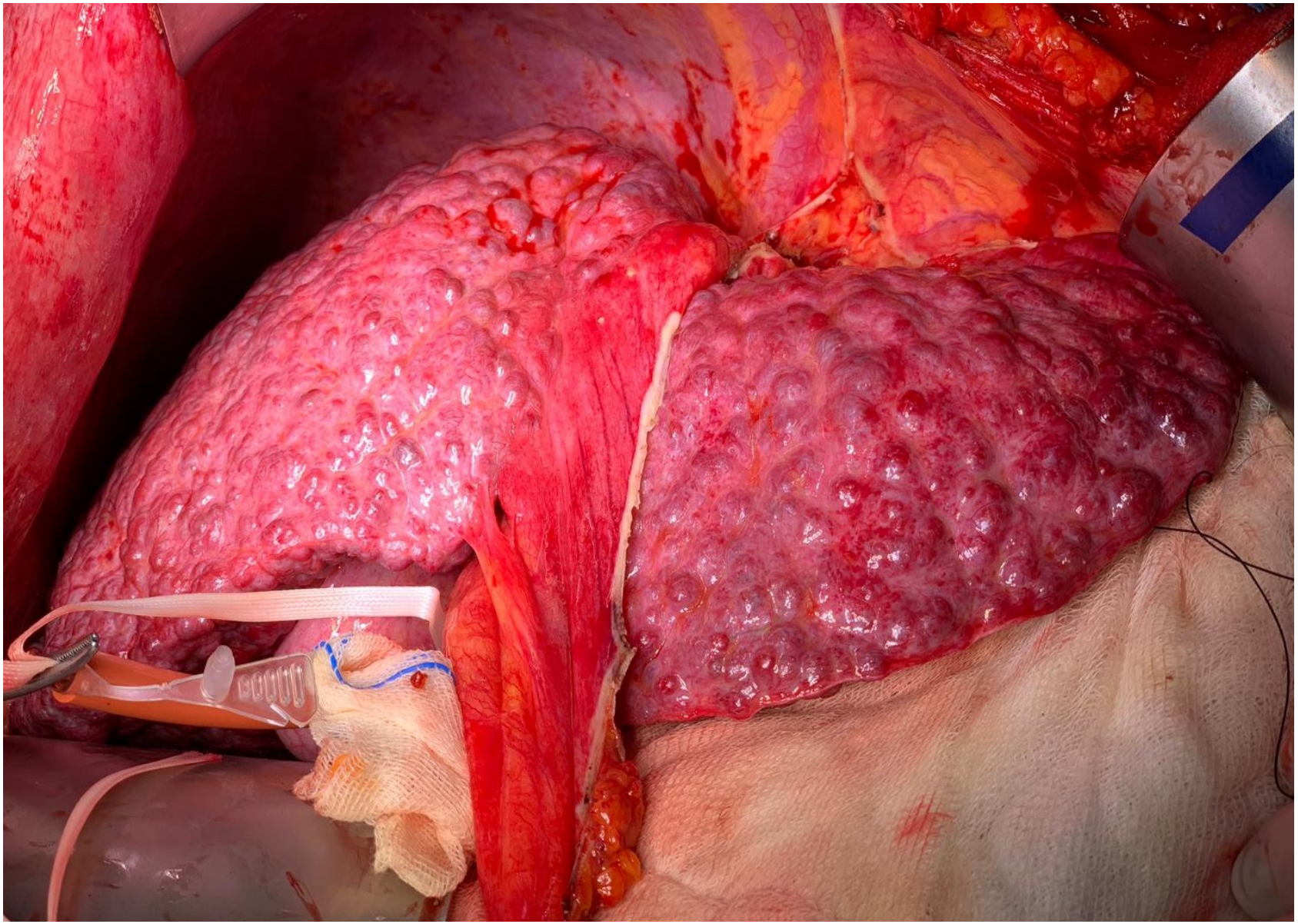
JOURNAL OF HEPATOLOGY

BCLC strategy for prognosis prediction and treatment recommendation: The 2022 update ☆

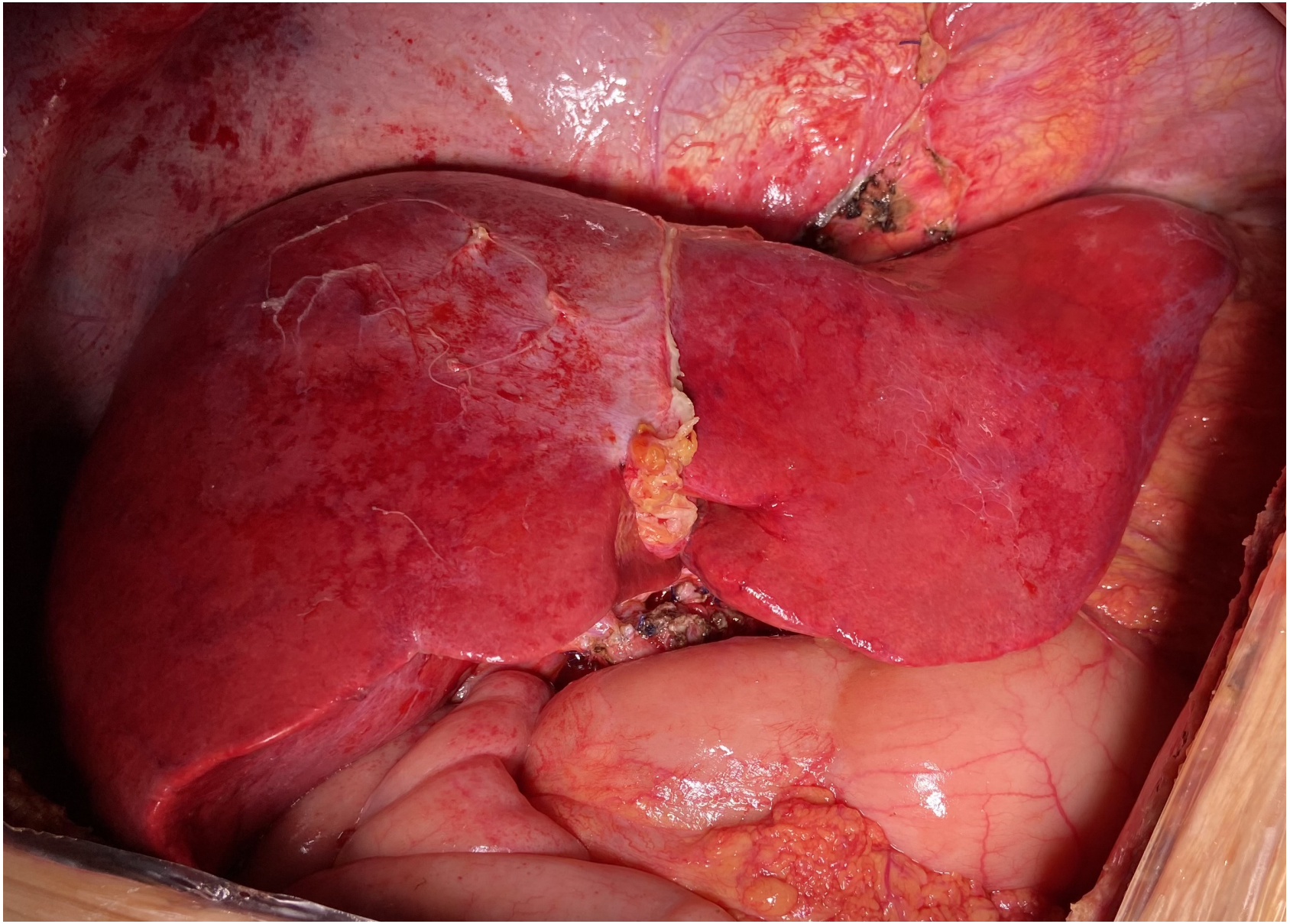


Reig M, et al. J Hepatol 2022;76:681-93

Liver transplant

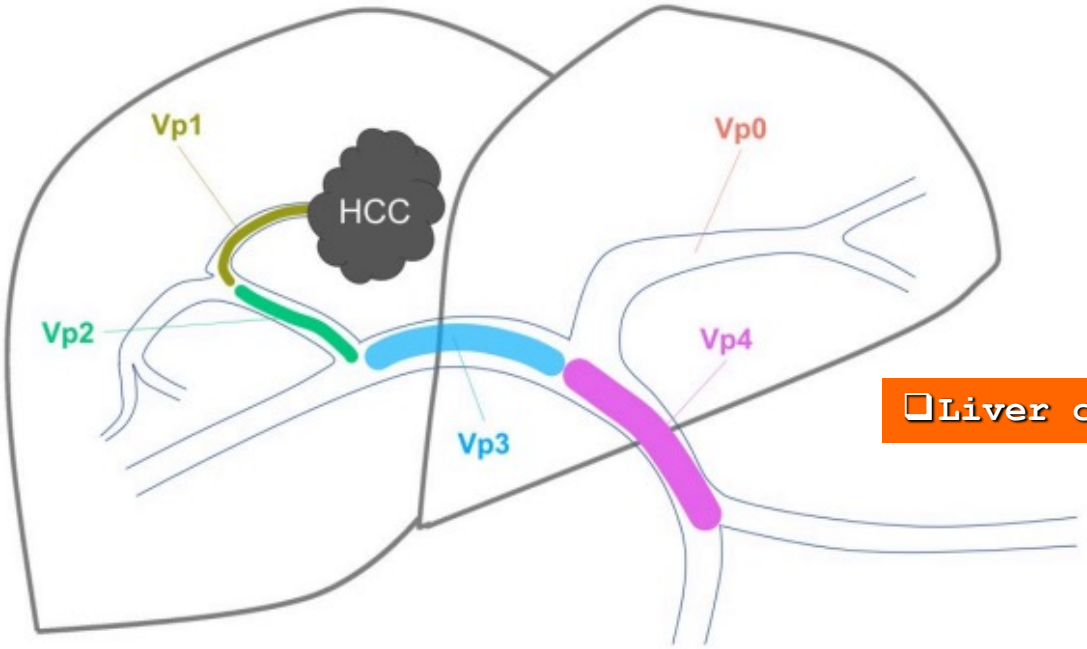


Liver transplant



Portal vein tumor thrombosis

CLASSIFICAÇÃO

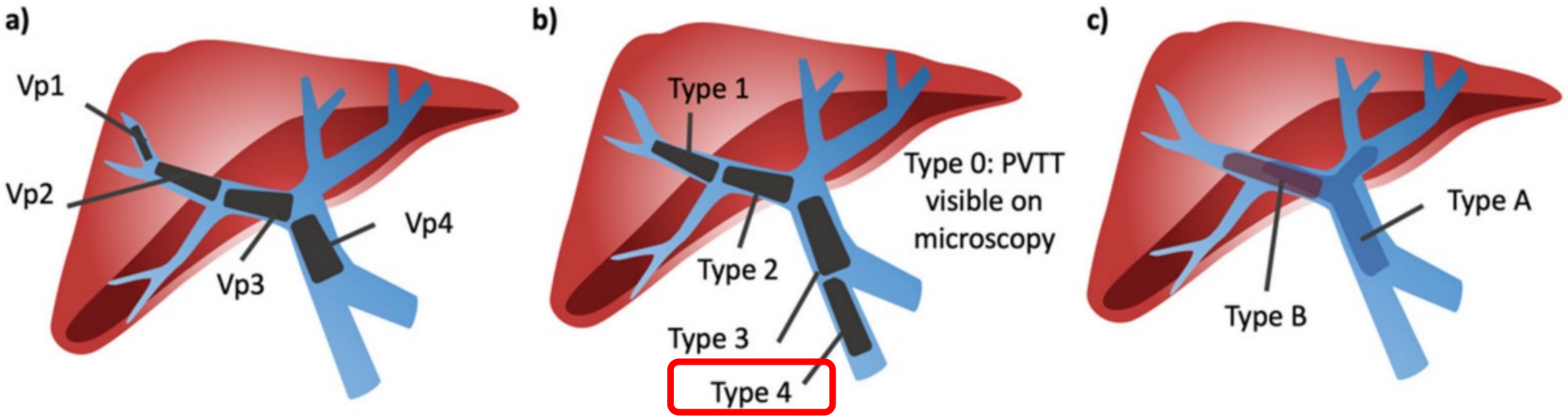


- Liver cancer study group of Japan

Fig 1. Figure describing the anatomical classification of portal vein tumor thrombosis as suggested by the Liver Cancer Study Group of Japan (LCSGJ). HCC, Hepatocellular carcinoma; Vp0 = no PVTT; Vp1 = segmental PV invasion; Vp2 = right anterior or posterior PV; Vp3 = right or left PV; and Vp4 = main trunk and/or contra-lateral portal vein branch to the primarily involved lobe.

Mahringer-Kunz A, et al. PLOS ONE 2021

Portal vein tumor thrombosis



- Liver cancer study group of Japan
- Cheng classification
- Xu classification

Zane KE, et al. Cancers 2021, 13, 5430.

Outros tratamentos

Table 1. Locoregional therapies for HCC with PVTT.

Study	Type	Size	PVTT	Treatment	Outcomes
Luo 2011 [17]	Prospective	164	Vp1–Vp4	TACE	12- and 24-mos. OS of 30.9% and 9.2%, downstaging in 10.7%
Zhu 2014 [18]	Retrospective	91	Vp2, Vp3	TACE + sorafenib	OS 14 mos
Yoon 2018 [19]	RCT	90	Vp 2–Vp4	TACE + ERBT	OS 13.8 mos, downstaging in 11.1%
Venerito 2020 [15]	Meta-analysis	1243	Vp 2–Vp4	TARE	Non-inferiority of TACE to sorafenib
Garin 2015 [20]	RCT	41	Vp 2–Vp4	Personalized Dosimetry TARE	OS 22.9 mos, downstaging in 12.2%
Yang 2012 [21]	RCT	104	Vp 1–Vp4	Cryotherapy + sorafenib	OS 12.5 mos
Giorgio 2016 [22]	RCT	99	Vp4	RFA + sorafenib	1-, 3-, and 5-year OS: 63%, 30%, and 20%
Ding 2020 [23]	Prospective	80	Vp1–Vp3	RFA + TACE + sorafenib	OS 15.3 mos
Long 2016 [24]	Prospective	109	Vp2–Vp4	MWA after TACE	OS 13.5 mos

PVTT = portal vein tumor thrombus; RCT = randomized, controlled trial; TACE = transarterial chemoembolization; ERBT = external beam radiotherapy; TARE = transarterial radioembolization; RFA = radiofrequency embolization; MWA = microwave ablation; downstaging refers to the percentage of patients who were able to undergo resection or ablation following treatment.

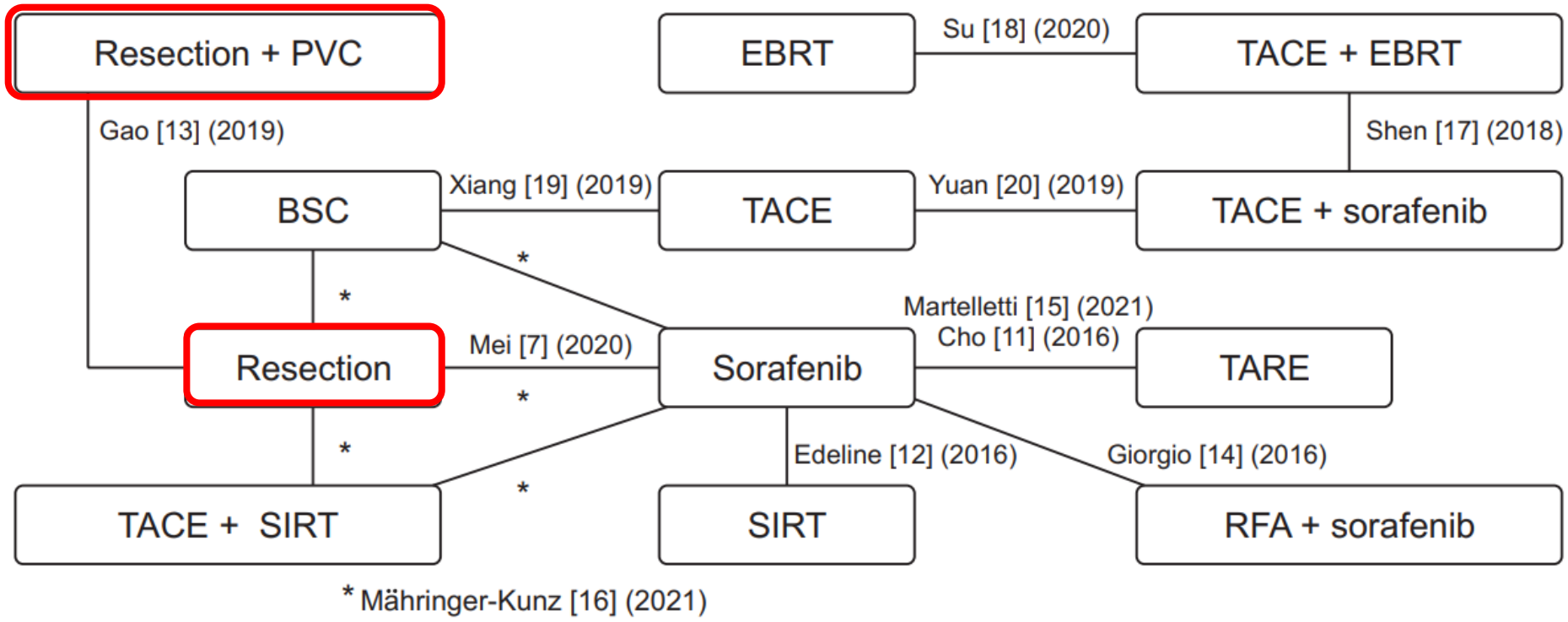
OS 12-24-mos
30% - 3 anos

Zane KE, et al. Cancers 2021, 13, 5430.

ASTR

ORIGINAL ARTICLE
pISSN 2288-6575 • eISSN 2288-6796
https://doi.org/10.4174/astr.2022.103.5.280
Annals of Surgical Treatment and Research

Comparing efficacies of different treatment regimens in patients with hepatocellular carcinoma accompanied by portal vein tumor thrombus using network meta-analysis



Lee S, et al. Ann Surg Treat Res 2022;103(5):280-289

Outros tratamentos

Table 1 Summary of combination treatments for hepatocellular carcinoma patients with portal vein tumor thrombosis

	Overall survival (mo)	Extent of PVTT (mo)		Ref.
		Main PVTT	Branch PVTT	
BSC	2-4			Llovet *et al*[3], Schöniger-Hekele *et al*[5]
Sorafenib	6.5-8.1			Llovet *et al*[9], Cheng *et al*[11]
TACE	7-10	5.3	10	Chung *et al*[21], Luo *et al*[22]
HAIC	6.5-14			Park *et al*[26], Ando *et al*[27], Eun *et al*[28]
RT	9.6-10.9			Toya *et al*[39], Nakazawa *et al*[40]
TARE	6-16.9	7.7	16.9	Salem *et al*[47], Kulik *et al*[49], Sangro *et al*[48], Memon *et al*[50]
TACE plus sorafenib	11-13	3	13-15	Pan *et al*[58], Zhu *et al*[59]
Sorafenib plus RT	8.6-10.6			Chen *et al*[53], Chow *et al*[61]
TACE plus RT	10.6-12	12		Yoon *et al*[64], Chung *et al*[72], Kim *et al*[73]
HAIC plus RT	12.1			Fujino *et al*[76]

BSC: Best supportive care; TACE: Transarterial chemoembolization; HAIC: Hepatic arterial infusion chemotherapy; RT: Radiation therapy; TARE: Transarterial radioembolization; PVTT: Portal vein thrombosis.

Han K, et al. World J Gastroenterol 2016; 22(1): 407-416

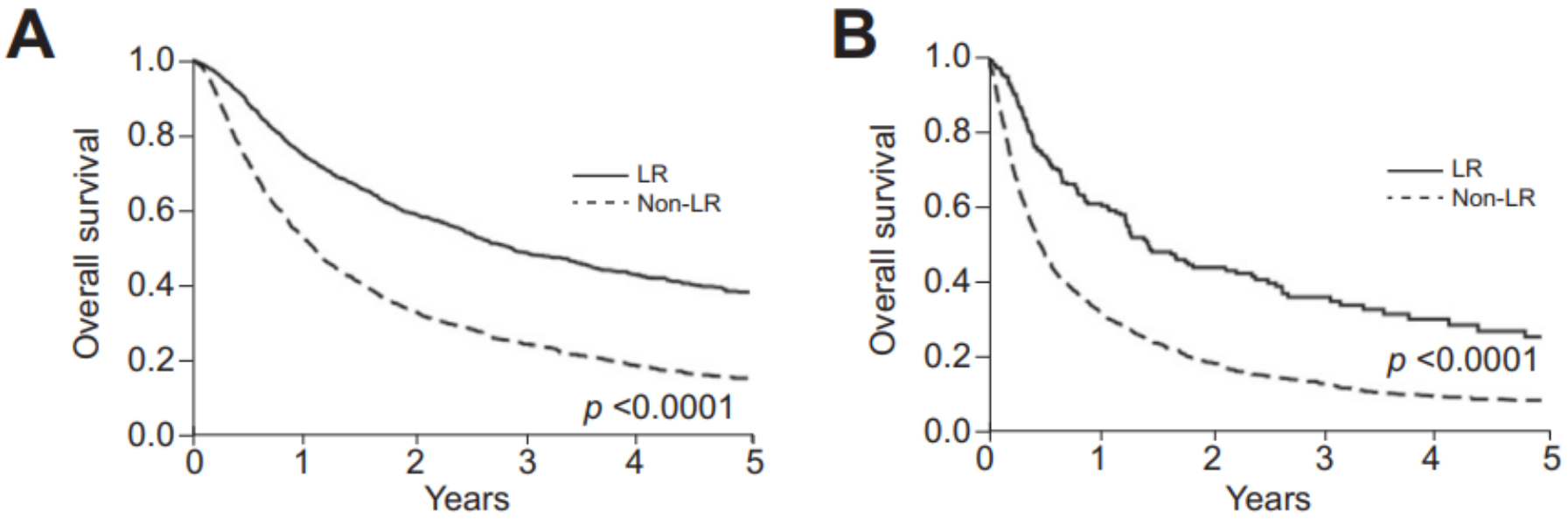
Research Article

CrossMark

EASL JOURNAL OF HEPATOLOGY

Survival benefit of liver resection for hepatocellular carcinoma associated with portal vein invasion

Ressecção vs Outros tratamentos



In conclusion, LR is associated with a longer survival outcome than non-surgical treatment in HCC patients with PVTT. As long as the PVTT is limited to a first-order branch, LR should be the first treatment of choice, especially in patients with good liver function.

Kokudo T, et al. J Hepatol 2016 ;65:938–43

pISSN 2287-2728
eISSN 2287-285X

CMH

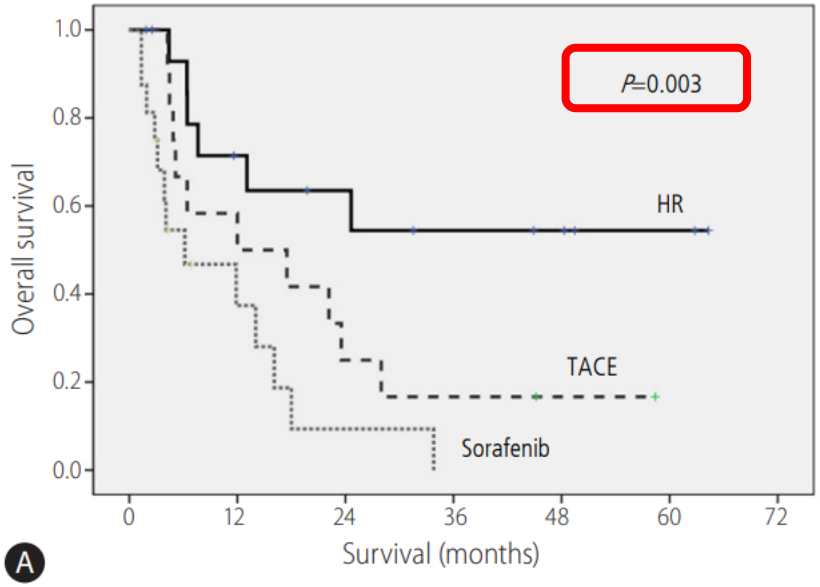
Original Article

http://dx.doi.org/10.3350/cmh.2016.22.1.160
Clinical and Molecular Hepatology 2016;22:160-167

Ressecção vs Outros tratamentos

Survival outcomes of hepatic resection compared with transarterial chemoembolization or sorafenib for hepatocellular carcinoma with portal vein tumor thrombosis

❑ Type I PVTT



❑ Type II PVTT

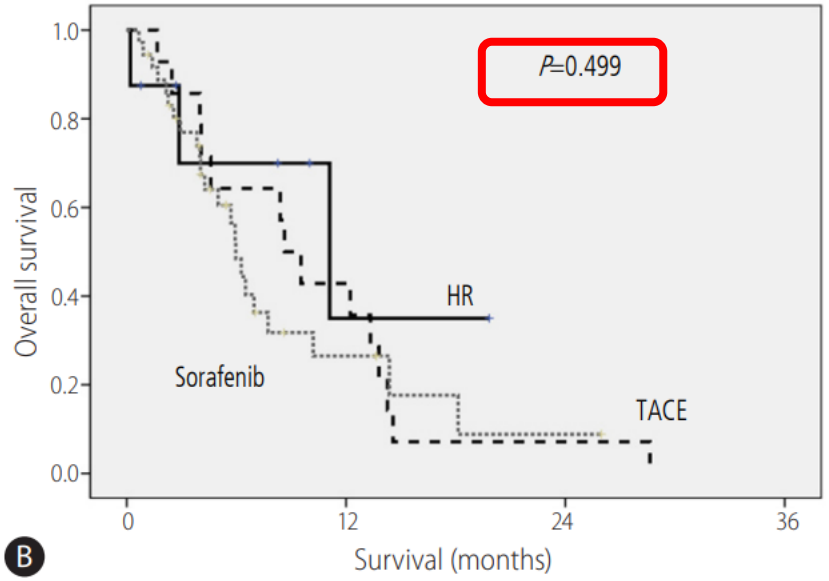


Figure 2. Overall survival curves for patients with type I PVTT who received HR, TACE, or sorafenib in period B (January 2008 to December 2011) (A) and for patients with type II PVTT in period B (B). HR, hepatic resection; TACE, transarterial chemoembolization; PVTT, portal vein tumor thrombosis.

Lee JM, et al. Clin Mol Hepatol 2016;22:160-167

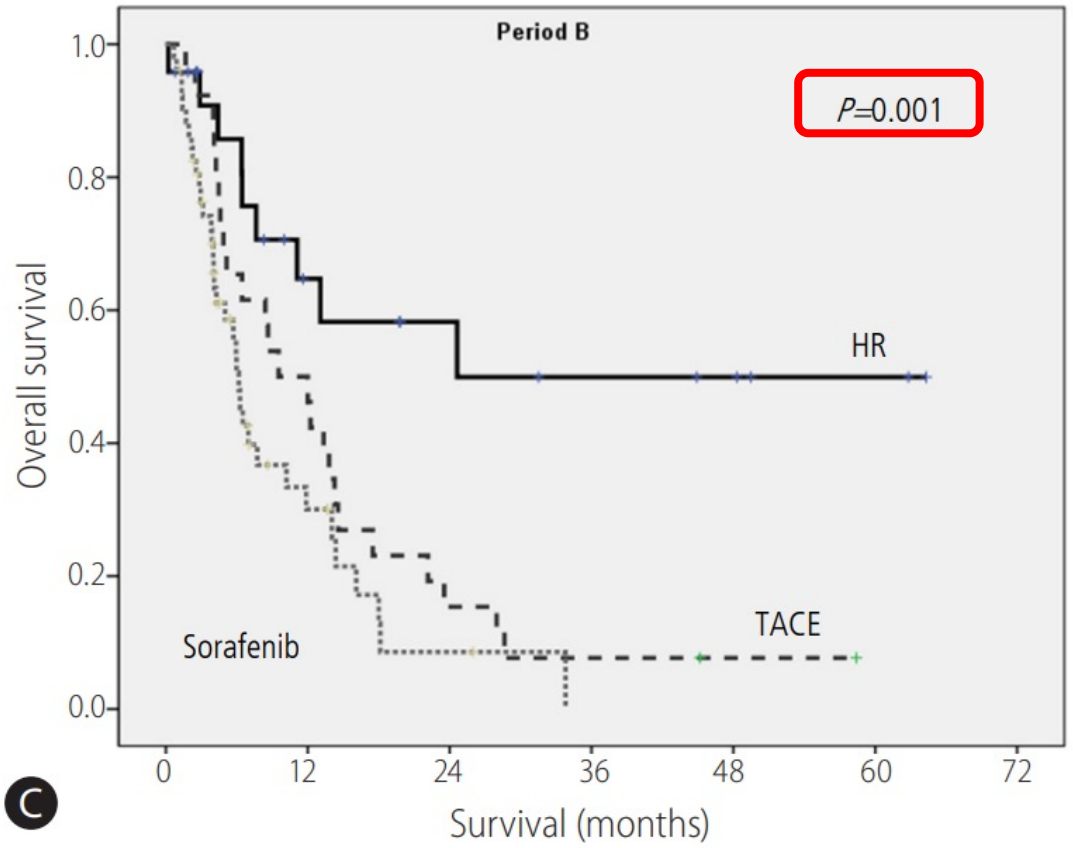
pISSN 2287-2728
eISSN 2287-285X

CMH

http://dx.doi.org/10.3350/cmh.2016.22.1.160
Clinical and Molecular Hepatology 2016;22:160-167

Original Article

Survival outcomes of hepatic resection compared with transarterial chemoembolization or sorafenib for hepatocellular carcinoma with portal vein tumor thrombosis



C

Lee JM, et al. Clin Mol Hepatol 2016;22:160-167

frontiers in Oncology

ORIGINAL RESEARCH
published: 05 May 2020
doi: 10.3389/fonc.2020.00573

Ressecção vs Outros tratamentos

Resection vs. Sorafenib for Hepatocellular Carcinoma With Macroscopic Vascular Invasion: A Real World, Propensity Score Matched Analytic Study

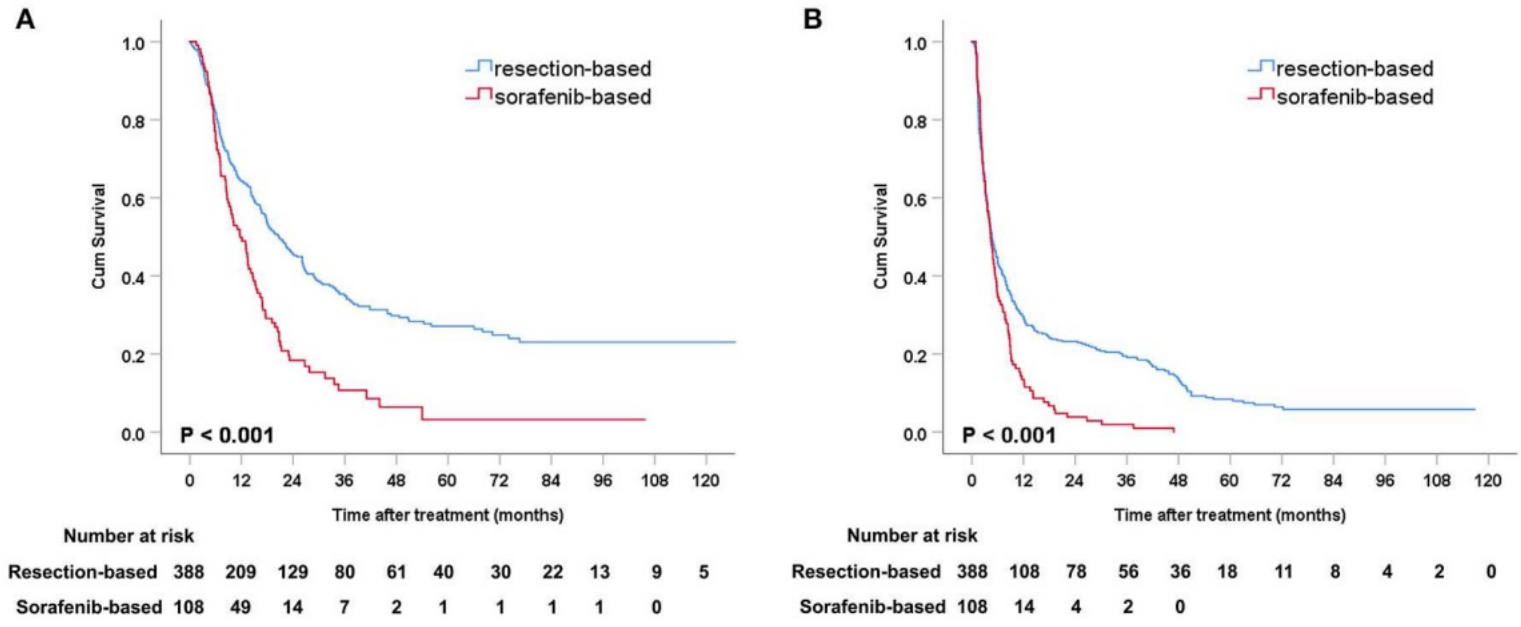


FIGURE 2 | Kaplan-Meier curves of survival outcomes after resection and sorafenib treatment in all patients. **(A)** Overall survival and **(B)** progression-free survival.

Mei J, et al. Frontiers Oncol 2020

frontiers in Oncology

ORIGINAL RESEARCH
published: 05 May 2020
doi: 10.3389/fonc.2020.00573

Ressecção vs Outros tratamentos

Resection vs. Sorafenib for Hepatocellular Carcinoma With Macroscopic Vascular Invasion: A Real World, Propensity Score Matched Analytic Study

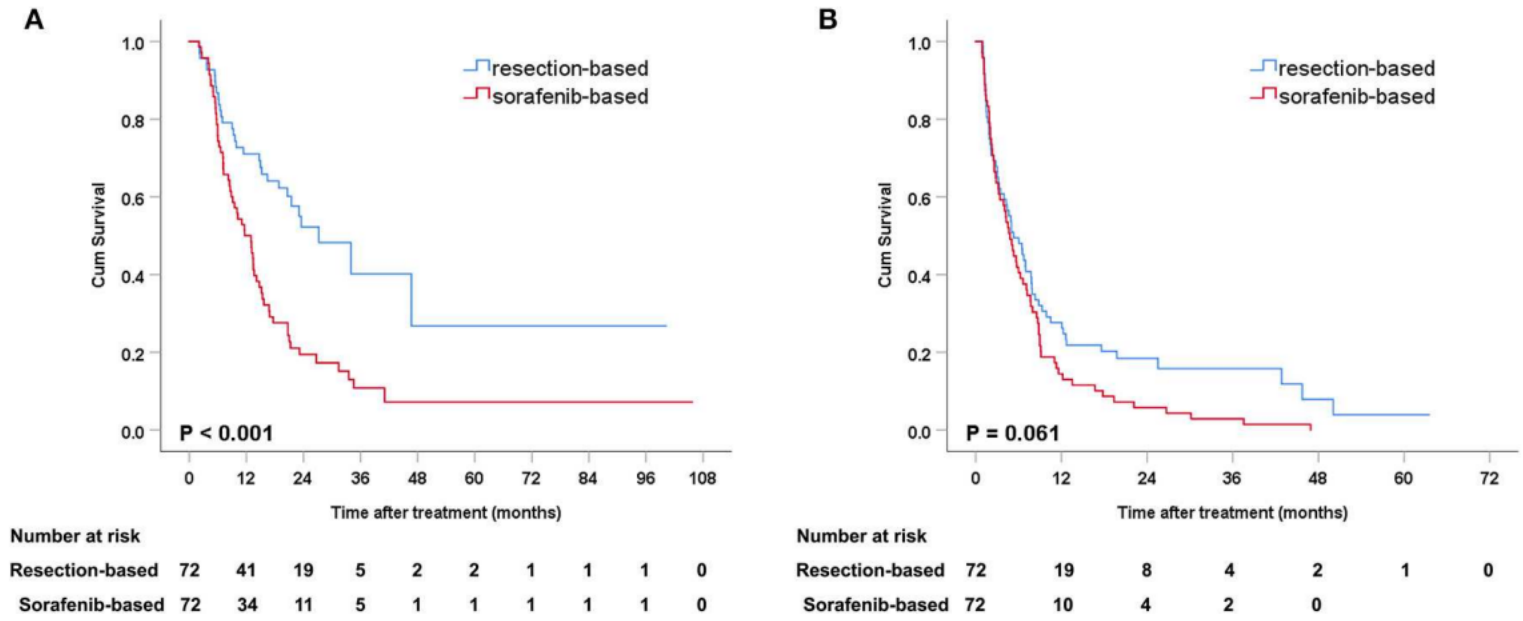
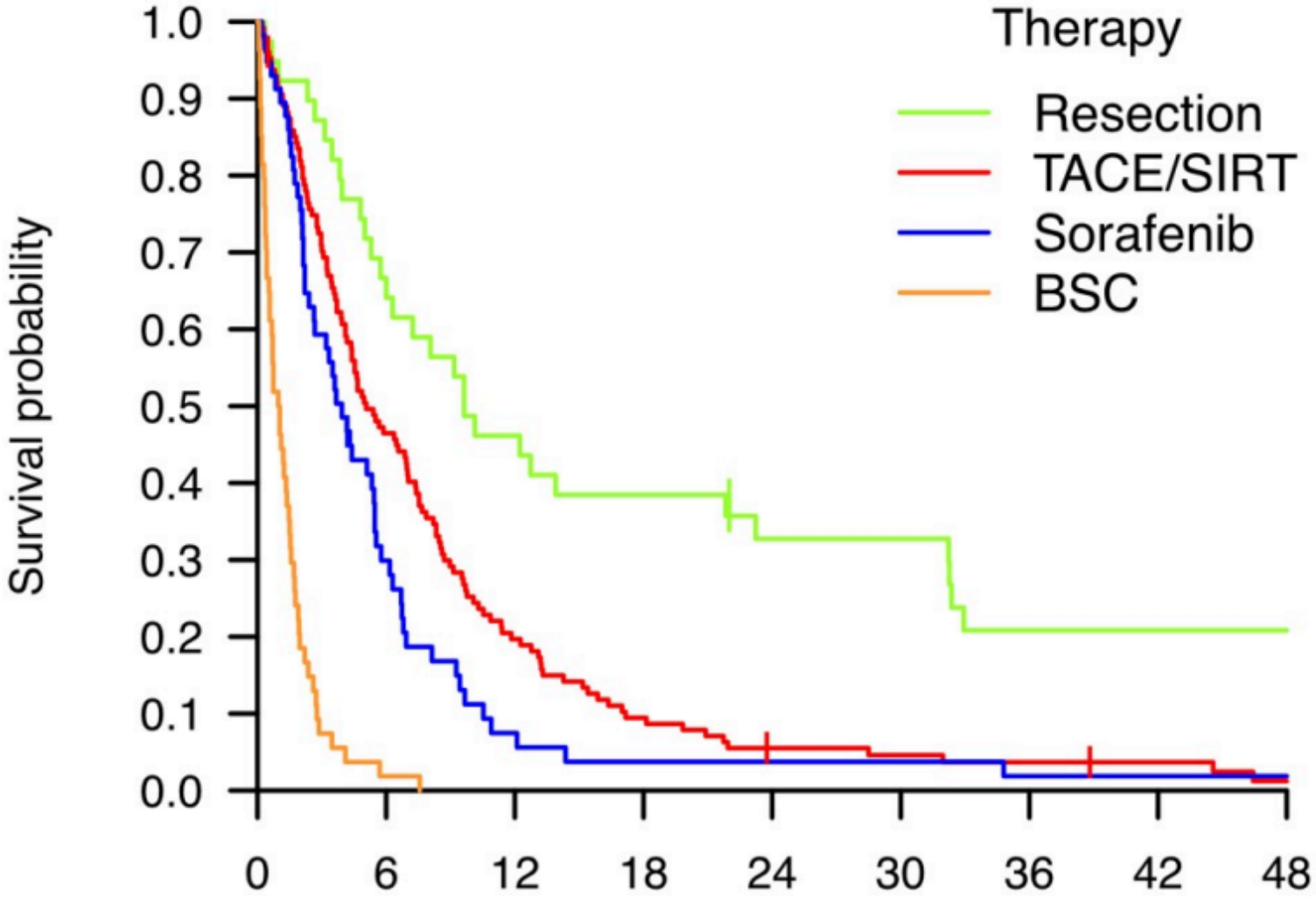


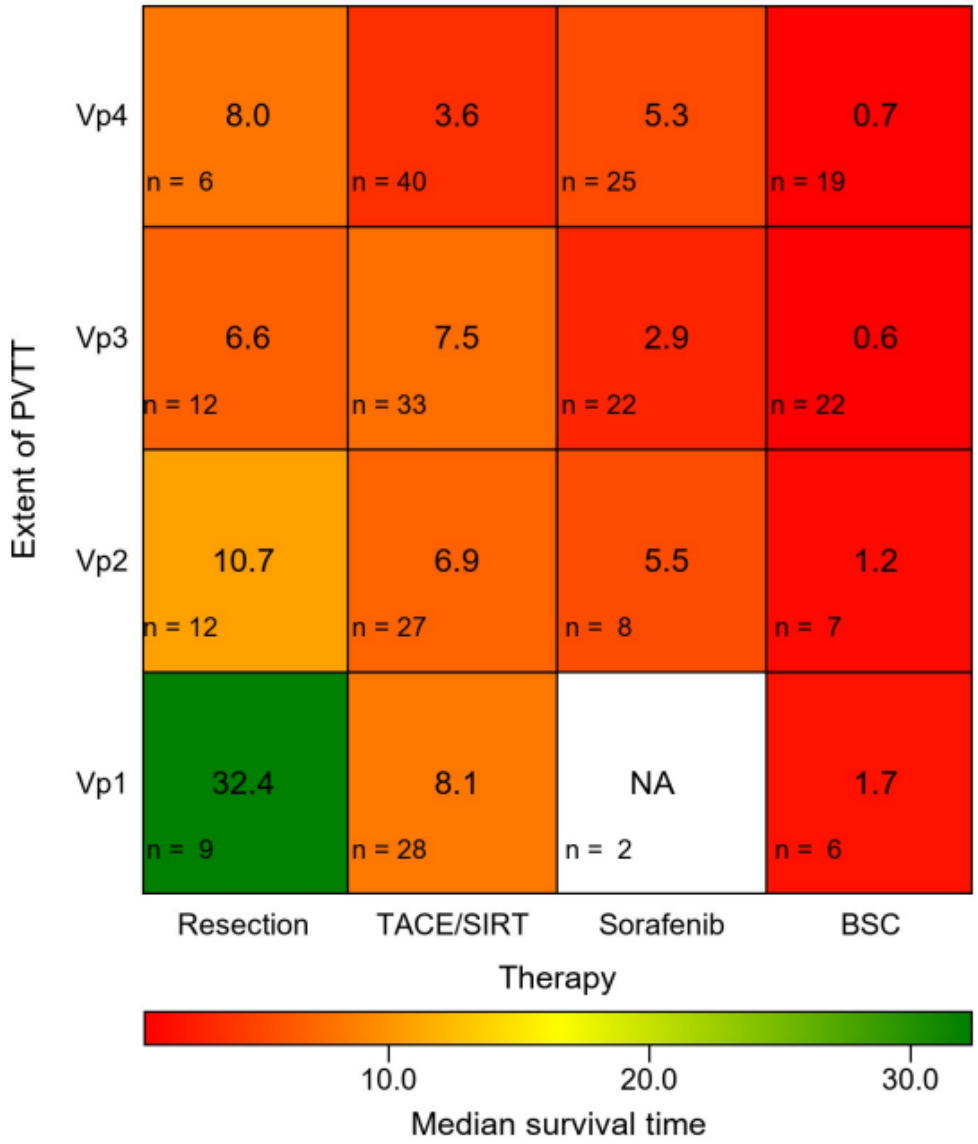
FIGURE 3 | Kaplan-Meier curves of survival outcomes after resection and sorafenib treatment in matched patients. **(A)** Overall survival and **(B)** progression-free survival.

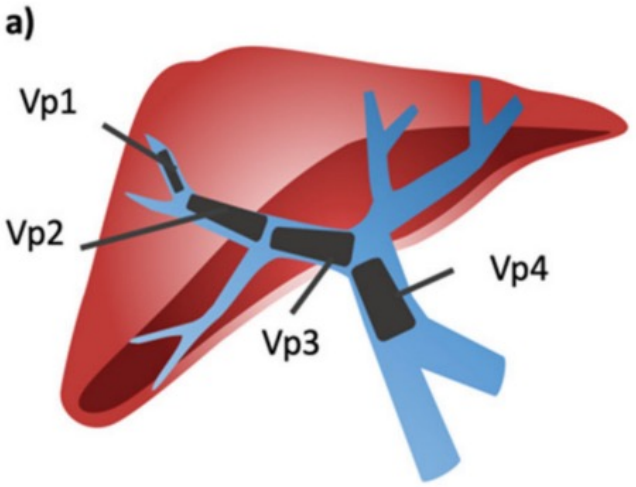
Mei J, et al. Frontiers Oncol 2020

Ressecção vs Outros tratamentos



Mahringer-Kunz A, et al. PLOS ONE 2021





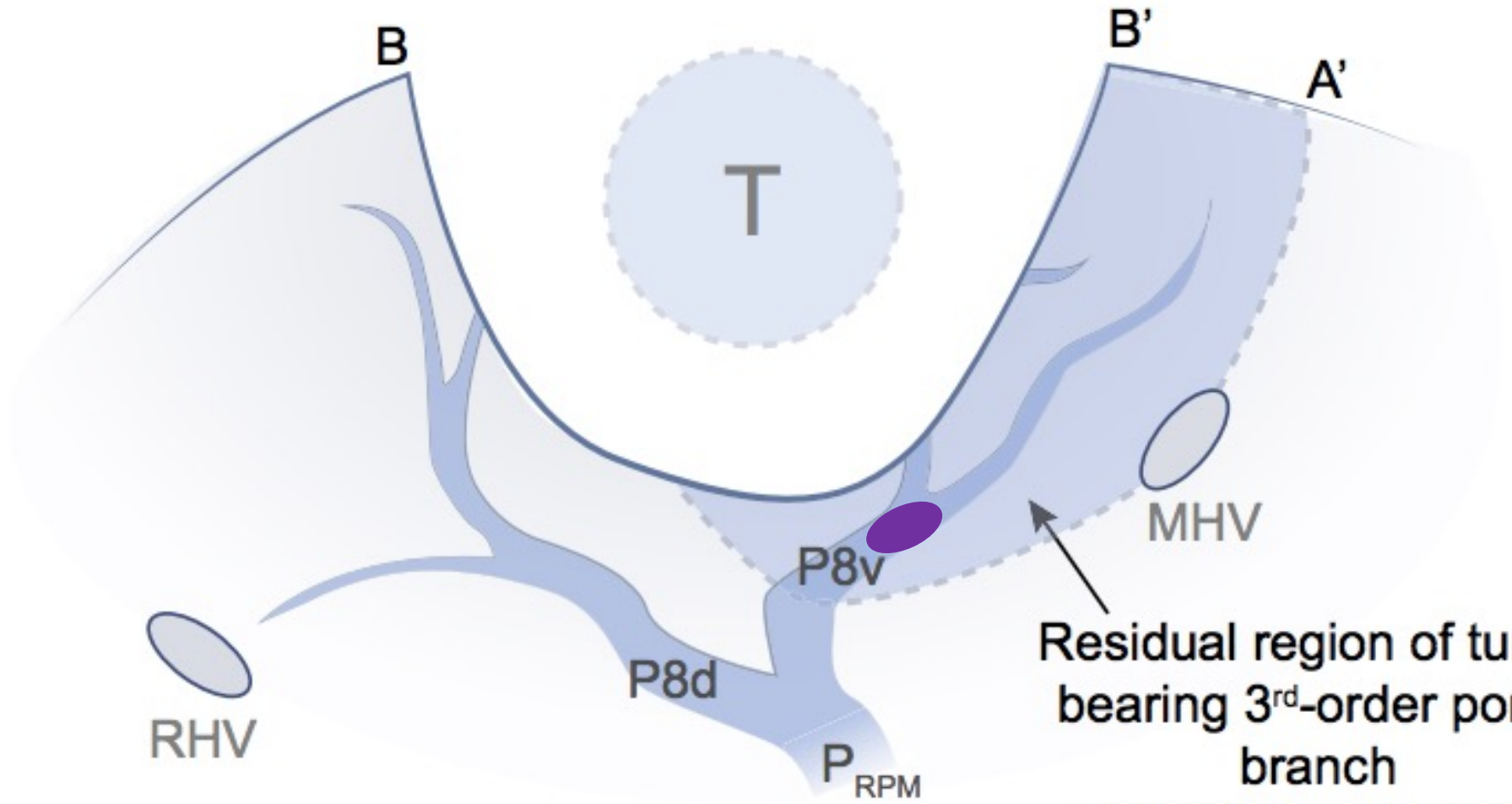
Extensão

Meses

Fig 4. Median overall survival according to treatment modalities and PVTT stage (Vp1–Vp4). Middle text field: Median OS; lower left corner: Number of patients; NA: Not available because n = 2. PVTT, Portal vein tumor thrombosis; TACE, Transarterial chemoembolization; SIRT, Selective internal radiation therapy; BSC Best supportive care.

Mahringer-Kunz A, et al. PLOS ONE 2021

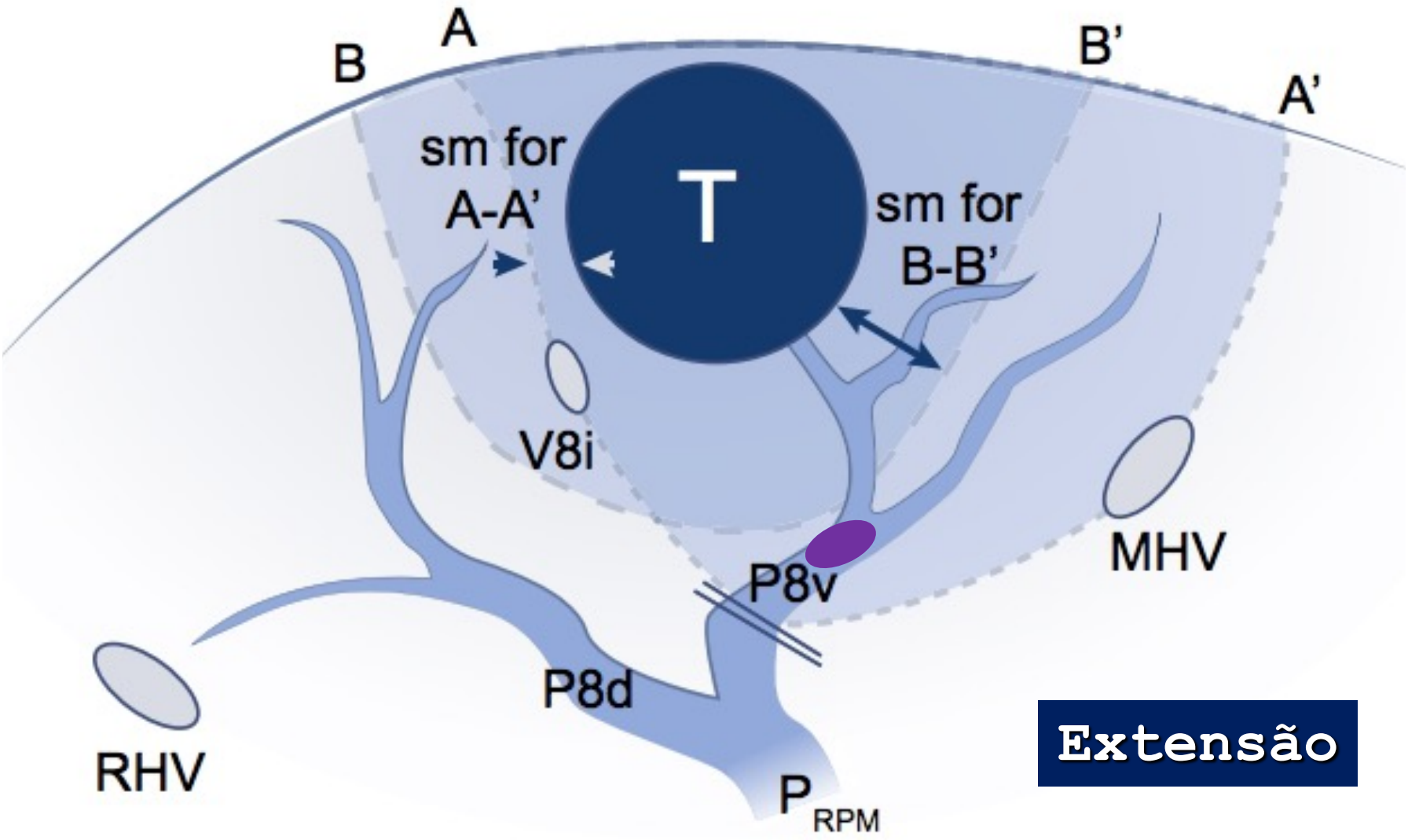
NON-ANATOMIC RESECTION



Extensão

Galle PR, et al. J Hepatol 2018;69:182-236

ANATOMIC RESECTION



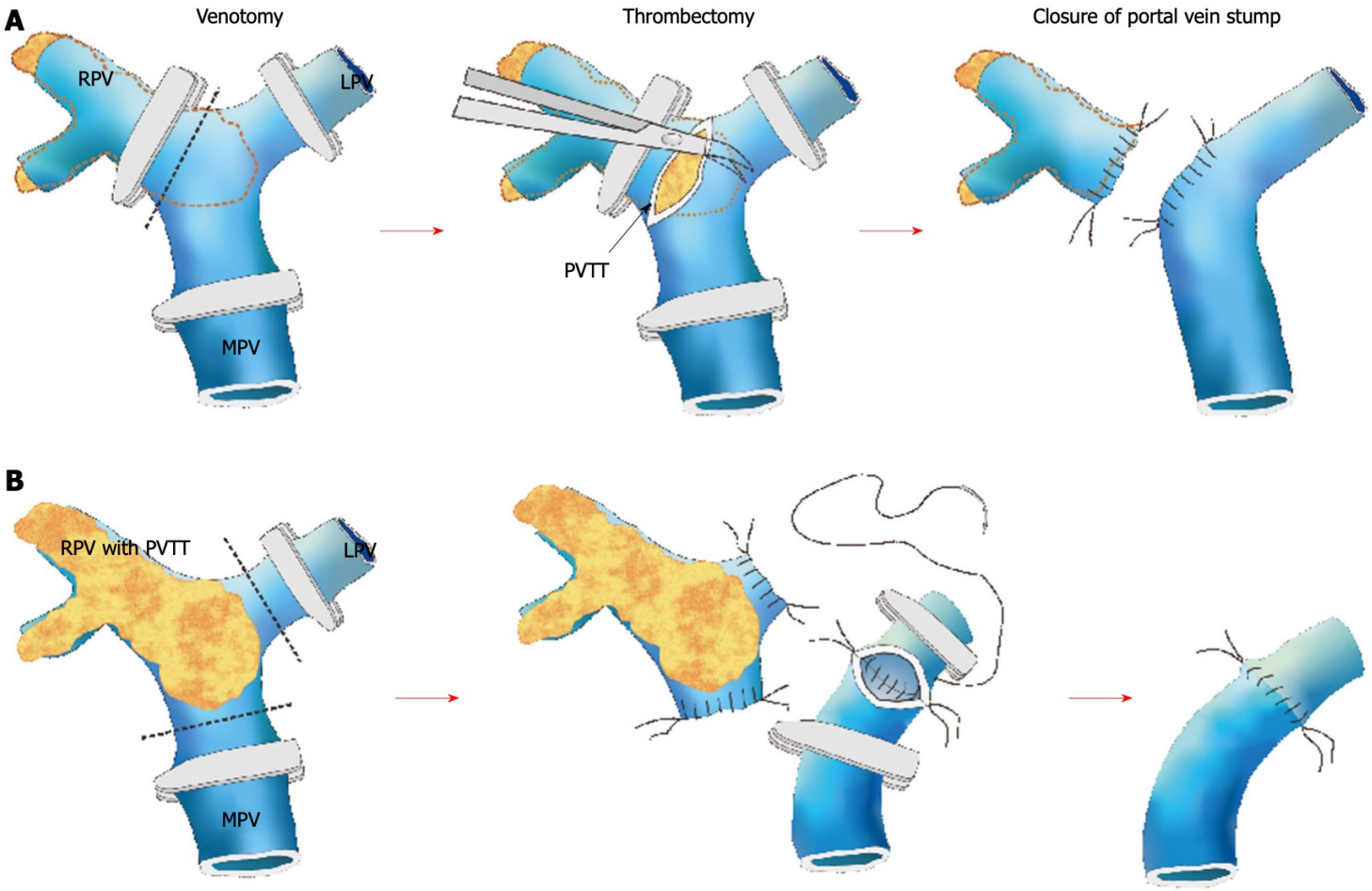
Extensão

Galle PR, et al. J Hepatol 2018;69:182-236

CIRURGIA

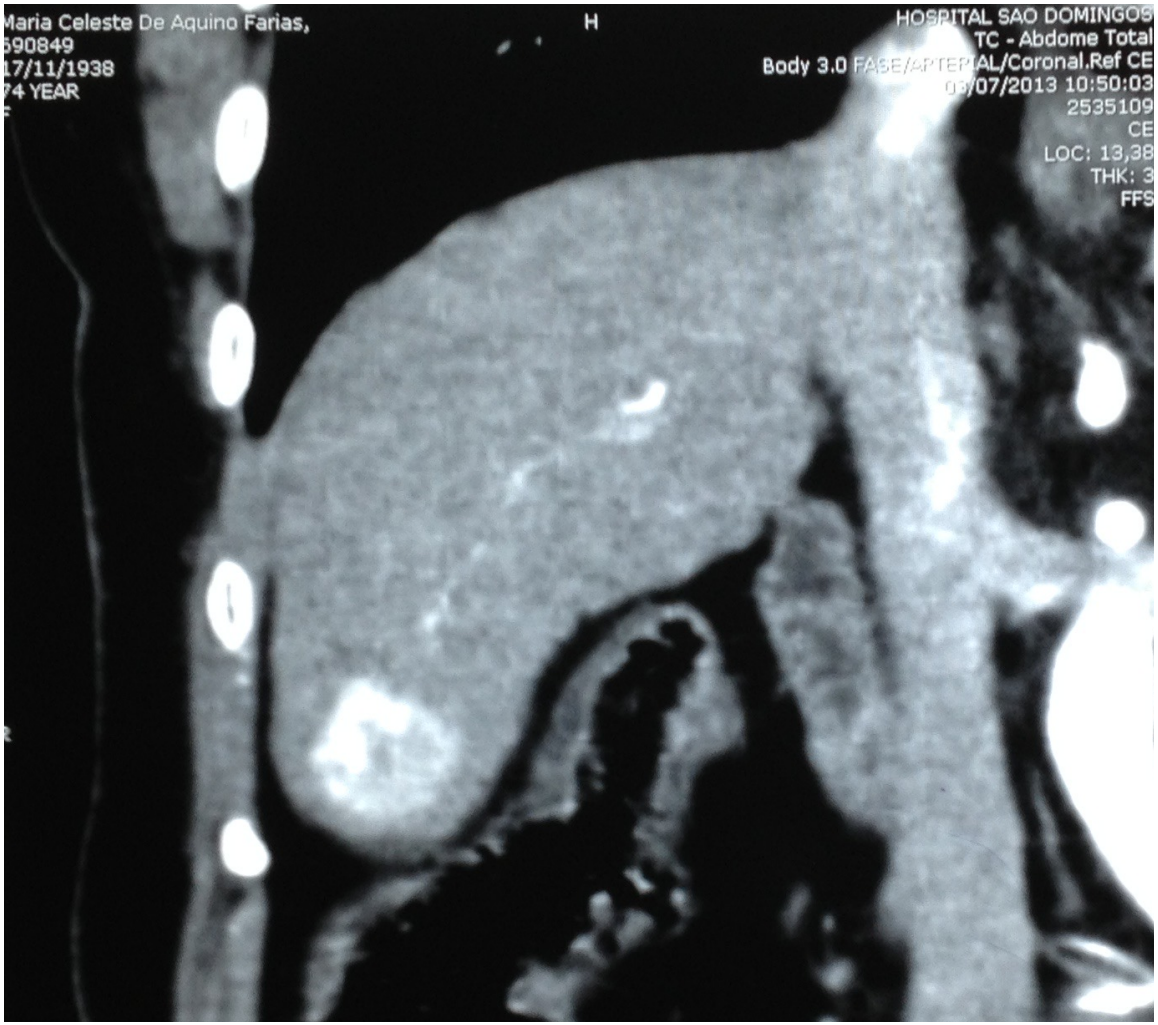
Em bloco

Hepatectomia + trombectomia



Chan SL, et al. World J Gastroenterol 2016

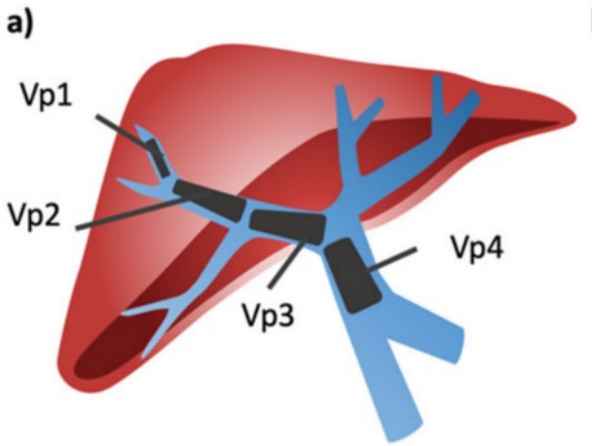
CONSIDERAR CIRURGIA MINIMAMENTE INVASIVA

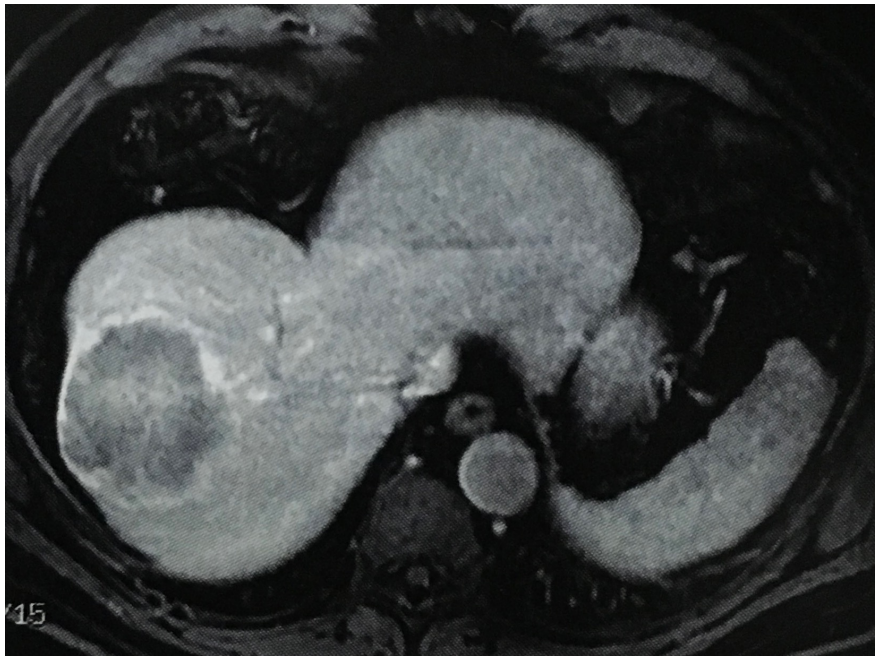


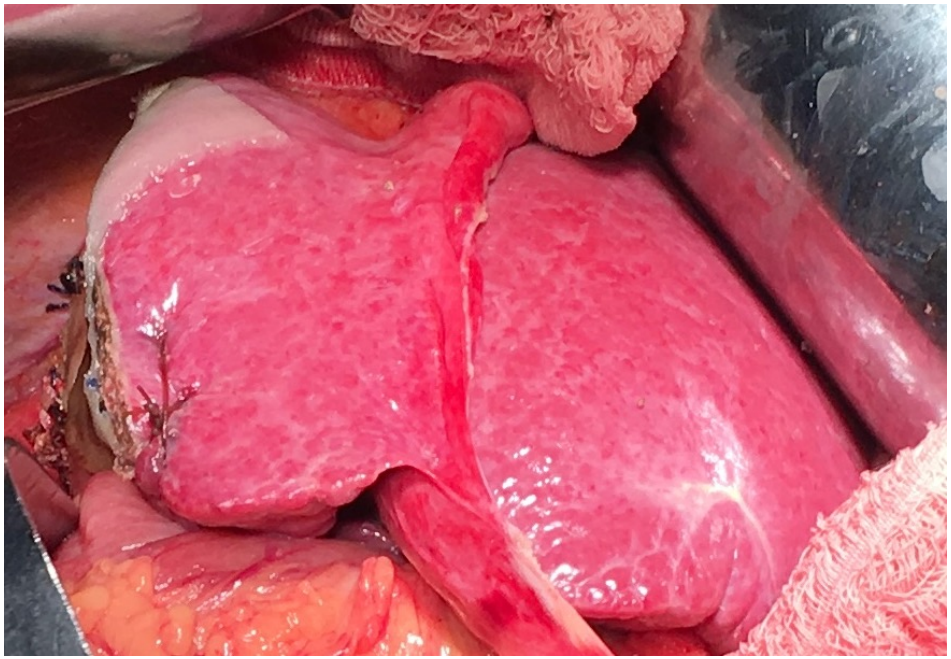
Em bloco

Portal vein tumor thrombosis

RESECTION







Original Article

Establishment and validation of a predictive model of recurrence in primary hepatocellular carcinoma after resection

RECORRÊNCIA

Table 2 Risk factors for recurrence of primary HCC after surgical resection

Variables	B	S.E.	Wald	P	Relative risk (95% CI)
Multiple foci	1.432	0.385	13.824	0.000	4.187 (1.968–8.906)
Poorly differentiated tumors	0.915	0.222	16.906	0.000	2.496 (1.614–3.860)
Ascites	0.969	0.486	3.977	0.046	2.635 (1.017–6.829)
Vascular invasion	1.686	0.491	11.787	0.001	5.398 (2.062–14.134)
Portal vein tumor thrombus	1.166	0.479	5.937	0.015	3.209 (1.256–8.199)
Constant	–11.466	1.890	36.814	0.000	0.000

HCC, hepatocellular carcinoma; S.E., standard errors; CI, confidence interval.

Xu Y, et al. J Gastrointest Oncol 2023;14(1):278-286

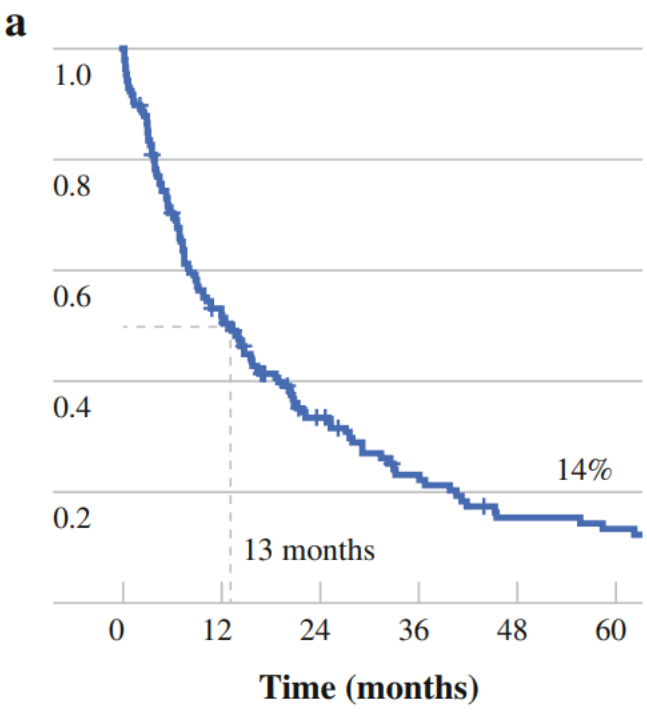
Ann Surg Oncol
DOI 10.1245/s10434-013-3074-7

Annals of
SURGICAL ONCOLOGY
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY

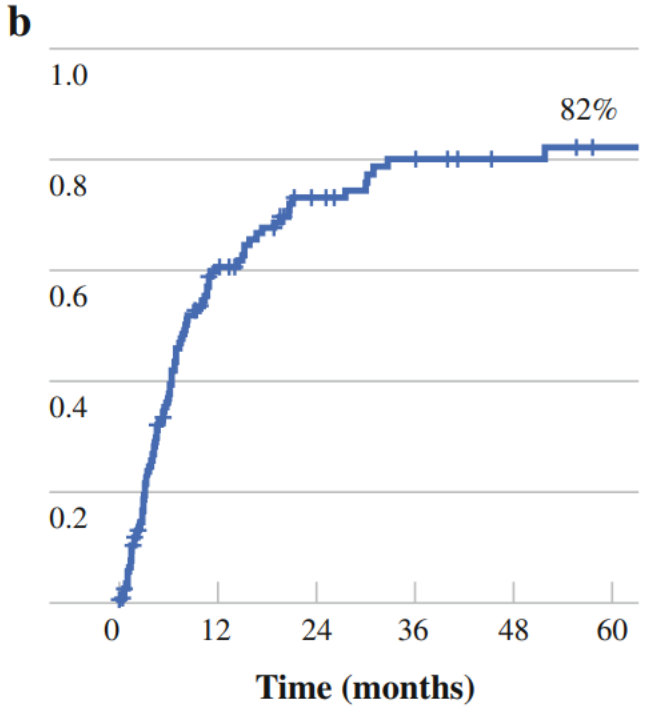
ORIGINAL ARTICLE – HEPATOBILIARY TUMORS

RECORRÊNCIA

Resection of Hepatocellular Carcinoma with Macroscopic Vascular Invasion



a. Sobrevida global



b. Tempo para recurrência

Roayaie S, et al. Ann Surg Oncol 2013

Ann Surg Oncol
DOI 10.1245/s10434-013-3074-7

Annals of
SURGICAL ONCOLOGY
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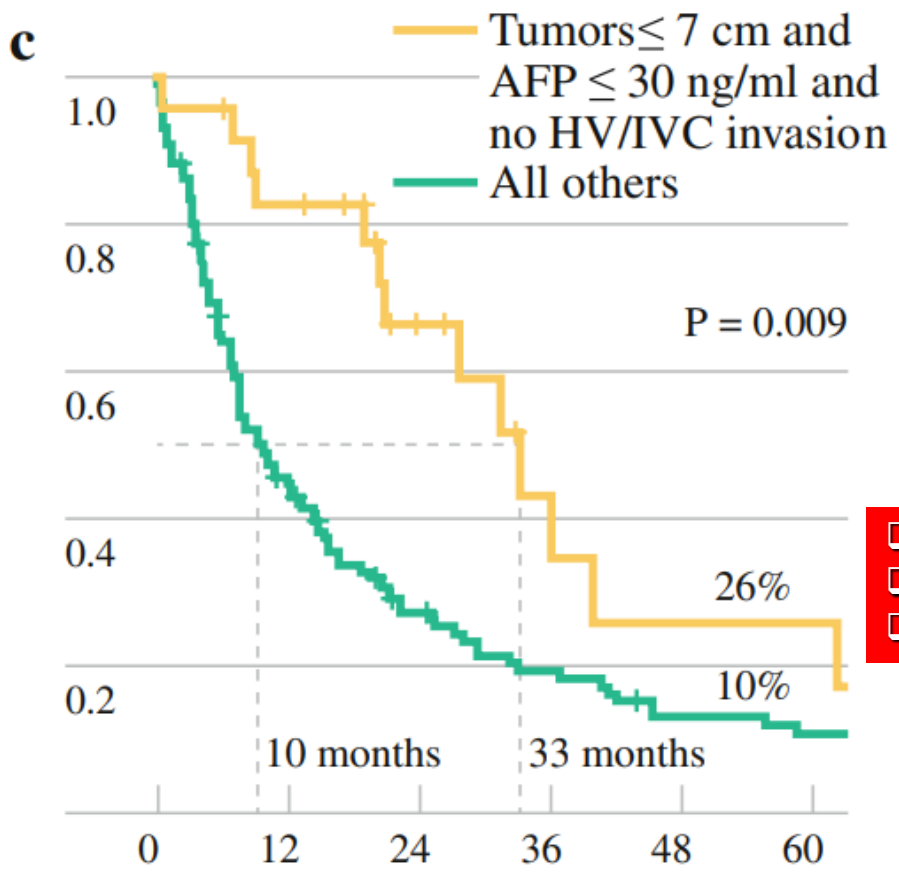
ORIGINAL ARTICLE – HEPATOBILIARY TUMORS

RECORRÊNCIA

Resection of Hepatocellular Carcinoma with Macroscopic Vascular Invasion



Fatores de risco

- α-fetoproteina (AFP) >30 ng/ml
- Tamanho do tumor > 7 cm
- Extensão da invasão vascular

Roayaie S, et al. Ann Surg Oncol 2013

Wang et al. World J Surg Onc (2021) 19:313
https://doi.org/10.1186/s12957-021-02425-w

World Journal of Surgical Oncology

RESEARCH Open Access

Improving outcomes of liver resection for hepatocellular carcinoma associated with portal vein tumor thrombosis over the evolving eras of treatment

Survival	No.	No. of events (%)	Median (95% CI) months	Survival rate (%) 1-yr	2-yr	3-yr
OS	157	125 (79.6)	15.4 (10.5-20.3)	56.7	39.7	30.4
RFS	157	131 (83.4)	4.1 (3.0-5.1)	25.9	19.4	16.4

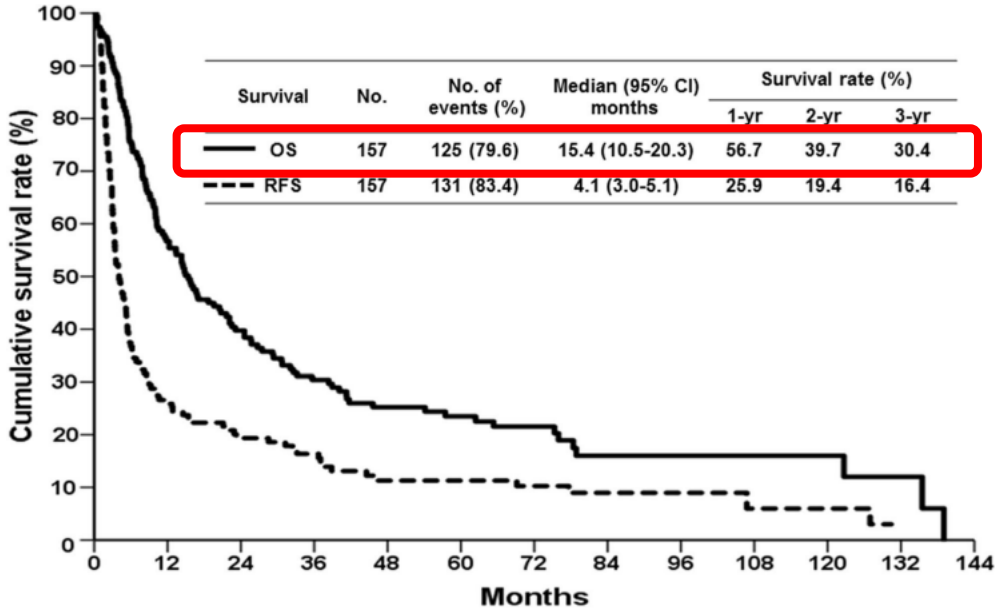


Fig. 1 Long-term cumulative recurrence-free survival (RFS) and overall survival (OS) curves of patients undergoing liver resection for hepatocellular carcinoma associated with portal vein tumor thrombosis

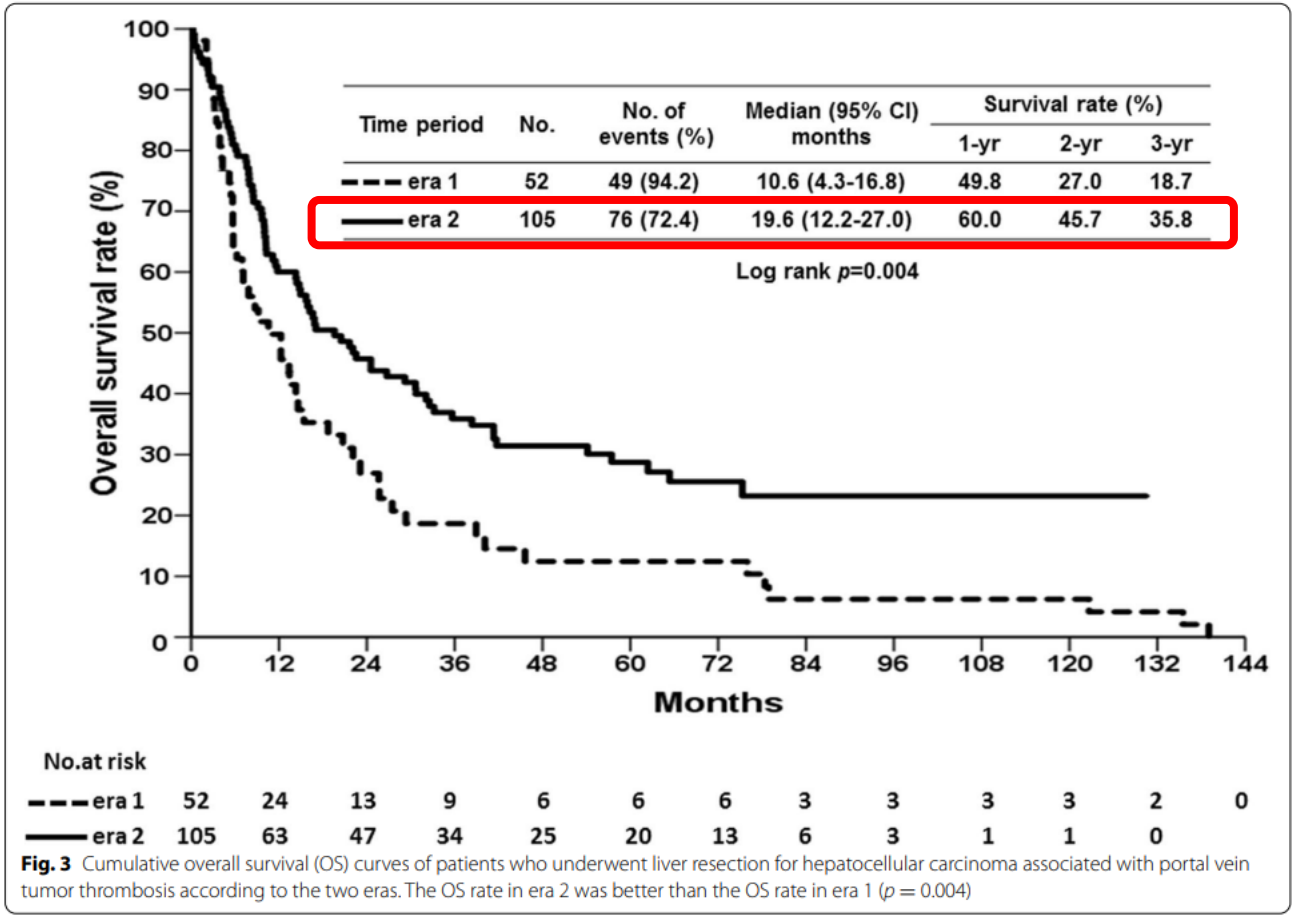


Fig. 3 Cumulative overall survival (OS) curves of patients who underwent liver resection for hepatocellular carcinoma associated with portal vein tumor thrombosis according to the two eras. The OS rate in era 2 was better than the OS rate in era 1 ($p = 0.004$)

Wang YC, et al. World J Surg Onc 2021;19:313

Received: 12 July 2019 | Revised: 8 August 2019 | Accepted: 30 August 2019

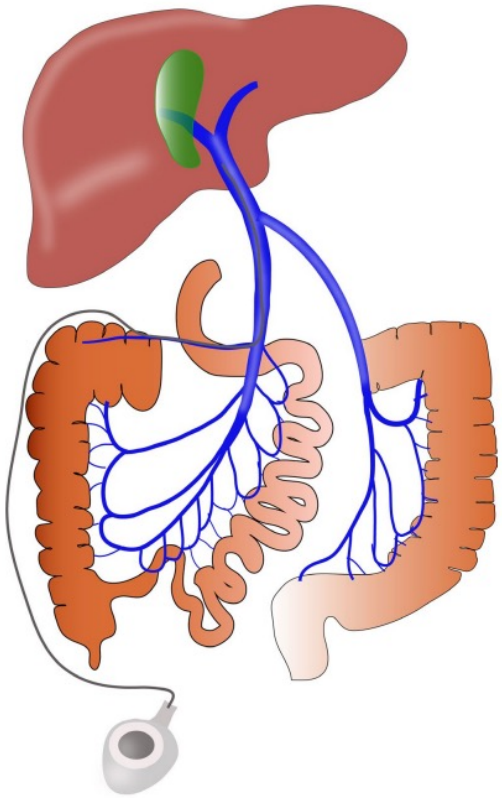
DOI: 10.1002/cam4.2556

ORIGINAL RESEARCH

Cancer Medicine Open Access WILEY

Chemotherapeutic perfusion of portal vein after tumor thrombectomy and hepatectomy benefits patients with advanced hepatocellular carcinoma: A propensity score-matched survival analysis

- ❑ Hepatectomia
- ❑ Trombectomia
- ❑ Quimioterapia



Gao Y, et al. Cancer Medicine. 2019;8:6933–6944.

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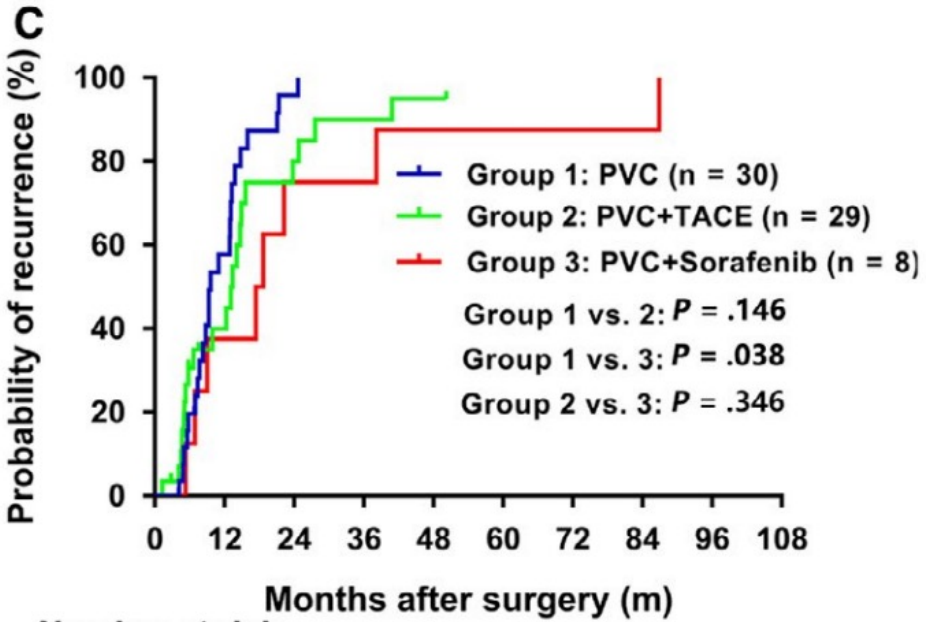
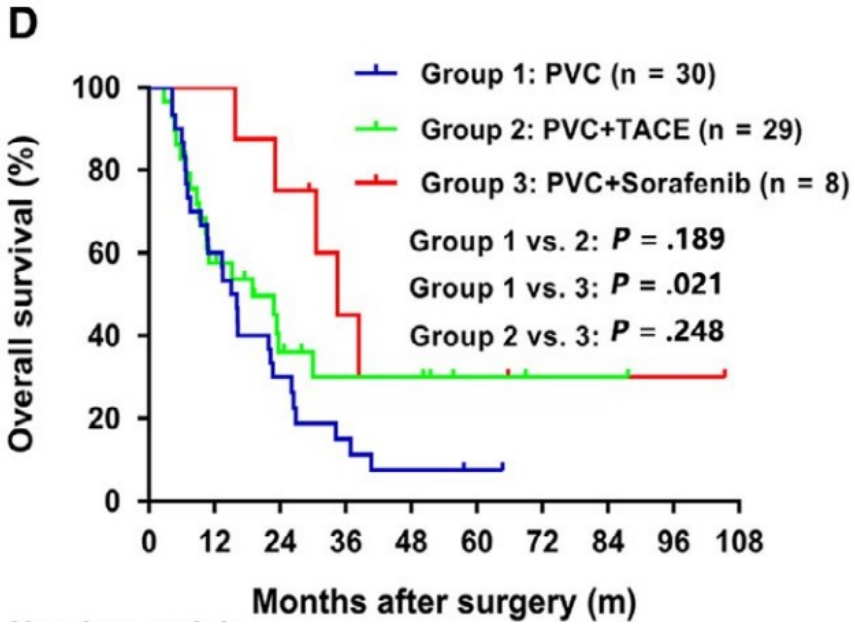
ORIGINAL RESEARCH

Cancer Medicine Open Access WILEY

Chemotherapeutic perfusion of portal vein after tumor thrombectomy and hepatectomy benefits patients with advanced hepatocellular carcinoma: A propensity score-matched survival analysis

- Hepatectomia
- Trombectomia
- Quimioterapia





Gao Y, et al. Cancer Medicine. 2019;8:6933–6944.

Original Article

Characteristics and outcomes of hepatocellular carcinoma patients with macrovascular invasion following surgical resection: a meta-analysis of 40 studies and 8,218 patients

Table 4 Median survival, complication rates, operation time and blood loss of liver resection for HCC with MVI

Outcomes and complications	Number of studies	Number of patients	Refer to sub-header
Median survival (months)			
Overall	21	3,909	14.39 (10.99–18.84)
PVTT only	13	2,437	12.97 (10.48–16.06)
PVTT and/or HVTT	8	1,472	16.83 (10.12–27.98)

*, all I^2>57.4 with P value <0.05, except for values marked. HCC, hepatocellular carcinoma; MVI, macrovascular invasion; PVTT, portal vein tumor thrombosis; HVTT, hepatic vein tumor thrombosis.

Huang DQ, et al. HepatoBiliary Surg Nutr 2022;11(6):848-860

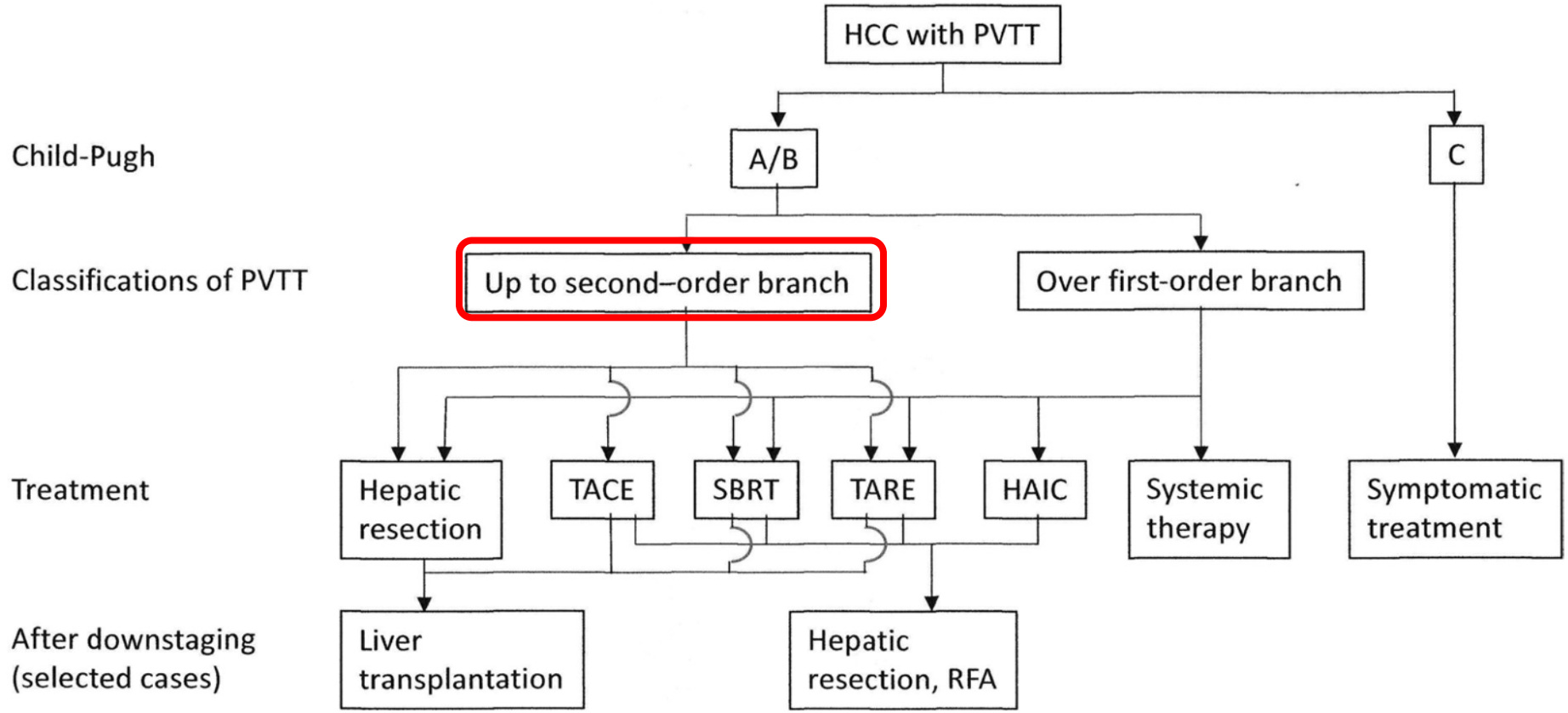
Original Article

Characteristics and outcomes of hepatocellular carcinoma patients with macrovascular invasion following surgical resection: a meta-analysis of 40 studies and 8,218 patients

Table 6 OS and RFS after liver resection in patients with HCC patients by sub-classification of PVTT

PVTT sub-classification	n/n	1-year, % (95% CI)	P	n/n	3-year, % (95% CI)	P	n/n	5-year, % (95% CI)	P	n/n	Median survival (months) (95% CI)	P
OS												
Segmental & second-order branch[a]	3/396	57.04 (38.92–73.45)	0.02	3/396	28.55 (21.47–36.86)	0.72	1, 20	21.75 (8.77–44.57)	0.98	3, 612	20.41 (15.16–27.48)	<0.0001
First-order branch[b]	4/223	42.16 (22.71–64.38)		3/172	17.85 (4.94–47.60)		1, 21	19.00 (7.31–41.10)		3, 466	12.91 (9.97–16.72)	
Main trunk & SMV[c]	3/101	19.59 (8.75–38.23)		2/70	0.00** (0.00–100.00)		1, 50	0.00 (0.00–100.00)		2, 214	6.41** (5.07–8.10)	

n/n, studies/patients; [a], segmental & second-order branch corresponds to Cheng's classification I and Japan's VP classification VP1 and VP2; [b], first-order branch corresponds to Cheng's classification II and Japan's VP classification VP3; [c], main trunk & SMV corresponds to Cheng's classification III and Japan's VP classification VP4; **, all available I^2>72.9 and all P value for available I^2 were <0.05, except for values marked. OS, overall survival; RFS, recurrence free survival; HCC, hepatocellular carcinoma; PVTT, portal vein tumor thrombosis; SMV, superior mesenteric vein.



Kawagishi N, et al. Hepatol int 2020

Carcinoma hepatocelular com trombose tumoral portal

- ❑ Não pode ser aplicada para todos os casos
- ❑ Deve ser bem classificada com exames de imagem
- ❑ A recurrência é elevado
- ❑ A cirurgia apresenta resultados razoáveis
- ❑ Sempre considerer cirurgia em Vp1 e Vp2
- ❑ Outras formas de tratamento ainda em evolução
- ❑ Considerar sempre reunião multidisciplinary

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