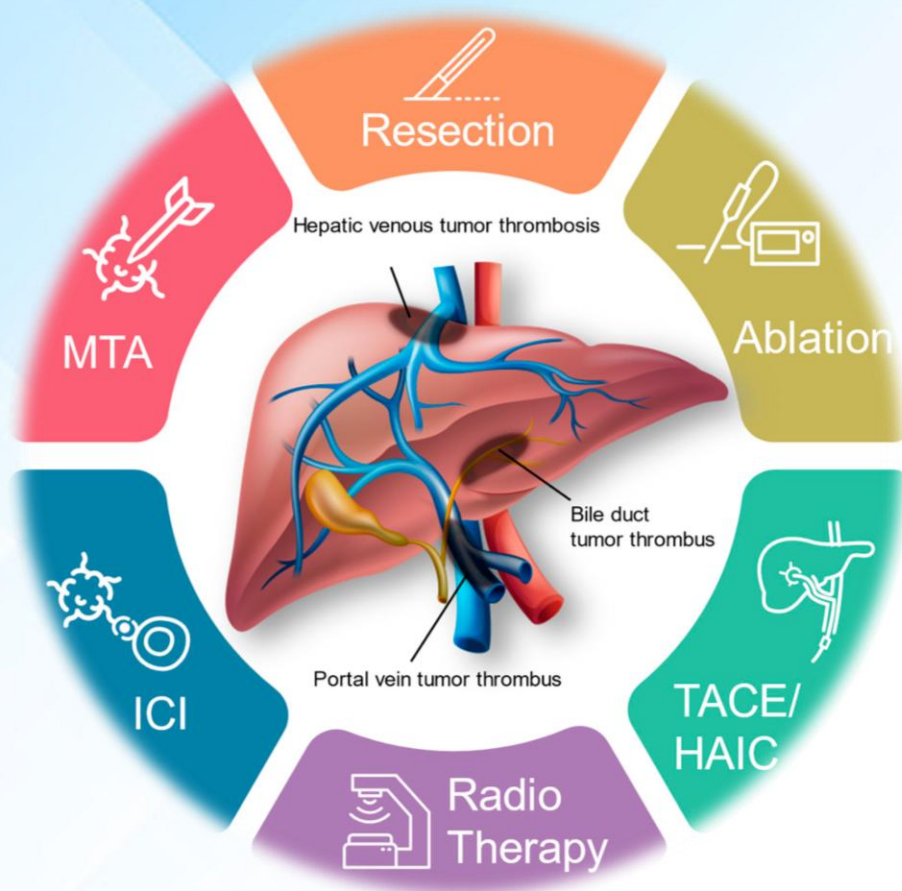




Vai trò can thiệp nội mạch trong điều trị ung thư tế bào gan (HCC)

Trần Doãn Khắc Việt

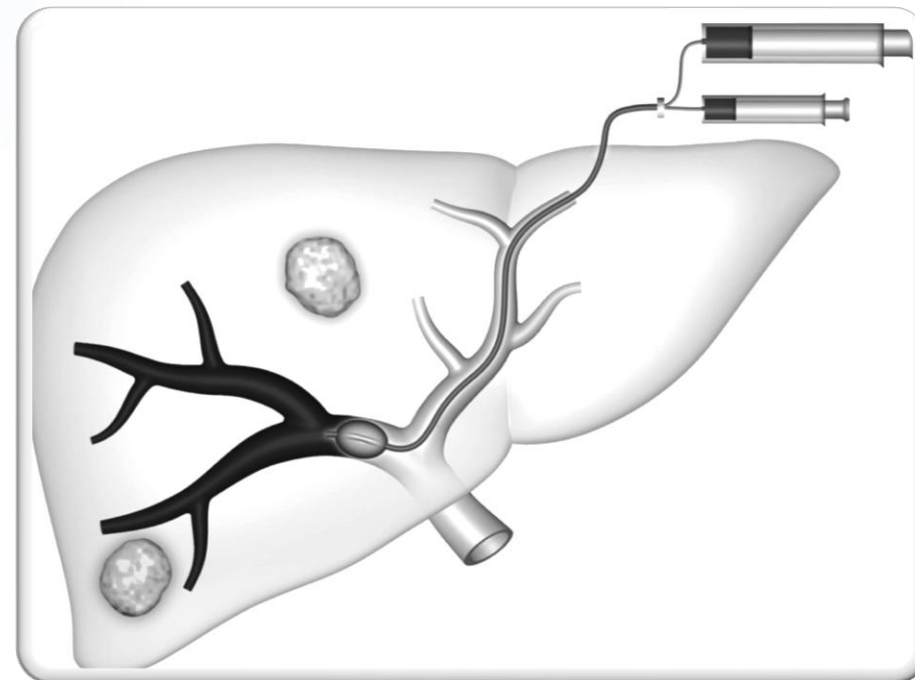
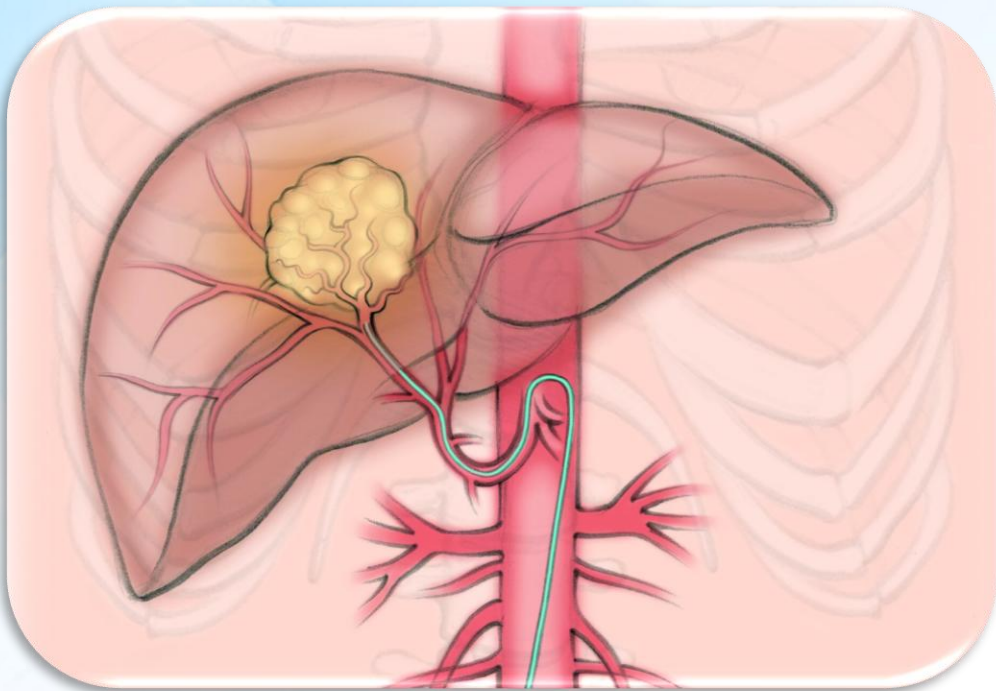
Khoa Chẩn Đoán Hình Ảnh

Bệnh viện Đại học Y Dược TP HCM



- Giới thiệu các kỹ thuật can thiệp nội mạch trong điều trị HCC
- Cập nhật các hướng dẫn mới nhất
- Đánh giá hiệu quả, chỉ định, chống chỉ định
- Giới thiệu các xu hướng mới gần đây





1/ Trans-arterial treatment

2/ Trans-venous treatment



1/ *Trans-arterial treatment*

- cTACE = TOCE, DebTACE
- TARE = Trans-arterial Radioembolization
- HAIC = Hepatic Arterial Infusion Chemotherapy

2/ *Trans-venous treatment*

- Portal Vein Embolization (PVE)
- Liver vein deprivation (PVE + HVE)



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- Portal Vein Embolization (PVE)
- Liver vein deprivation (PVE + HVE)



TACE Background

Targeting cancerous lesions fed by the hepatic artery since 1972.

Fundamental principal of TACE:

Liver parenchyma is supplied from portal vein

but

Hepatocellular carcinoma (HCC) is supplied
by hepatic artery (>80%)

Therefore

Selective injection of cytotoxic agent through branches of hepatic artery can target malignancy while sparing healthy liver parenchyma

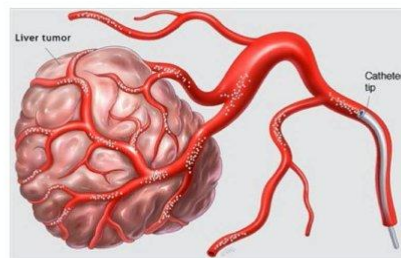
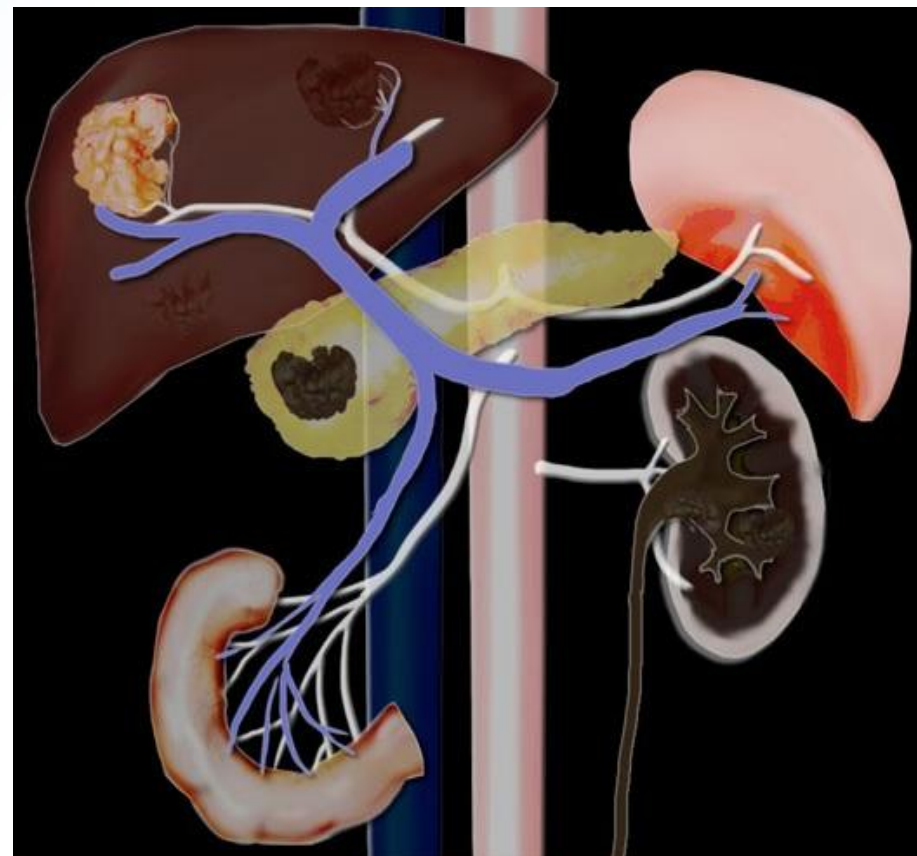


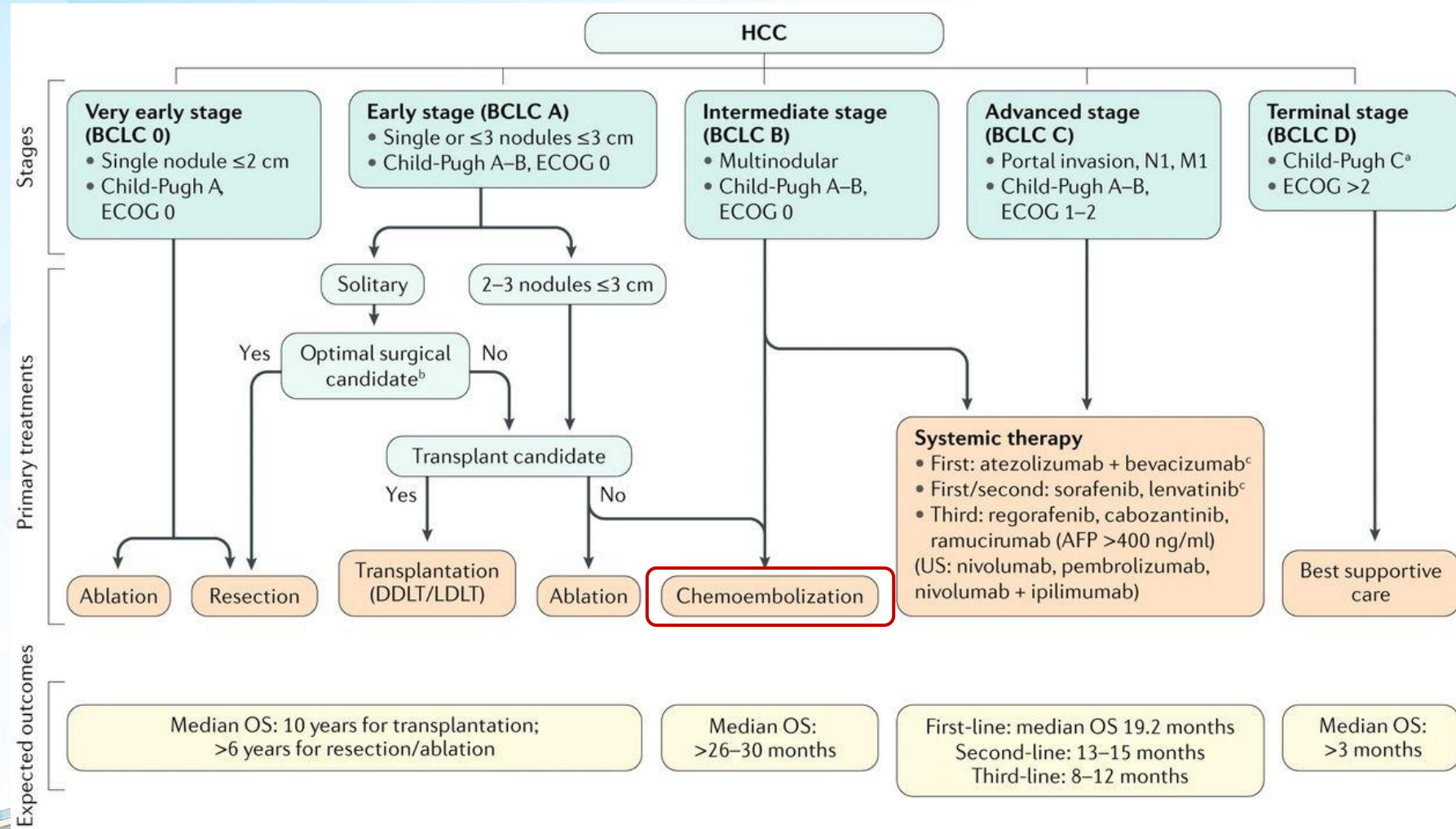
Image: <https://www.virchicago.com/cancer-treatment/>

RFS
Resident, Fellow and
Student Section



Source: Virchicago





J Hepatol. 2022 March ; 76(3): 681–693
Doi:10.1016/j.jhep.2021.11.018



Clin Mol Hepatol > Volume 25(4); 2019 > Article

Review

Clin Mol Hepatol. 2019; 25(4): 344-353.

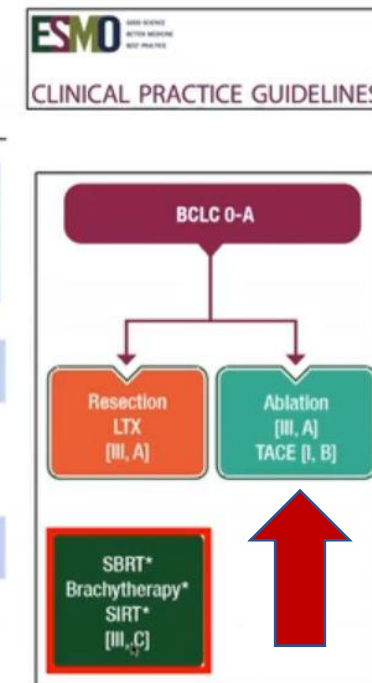
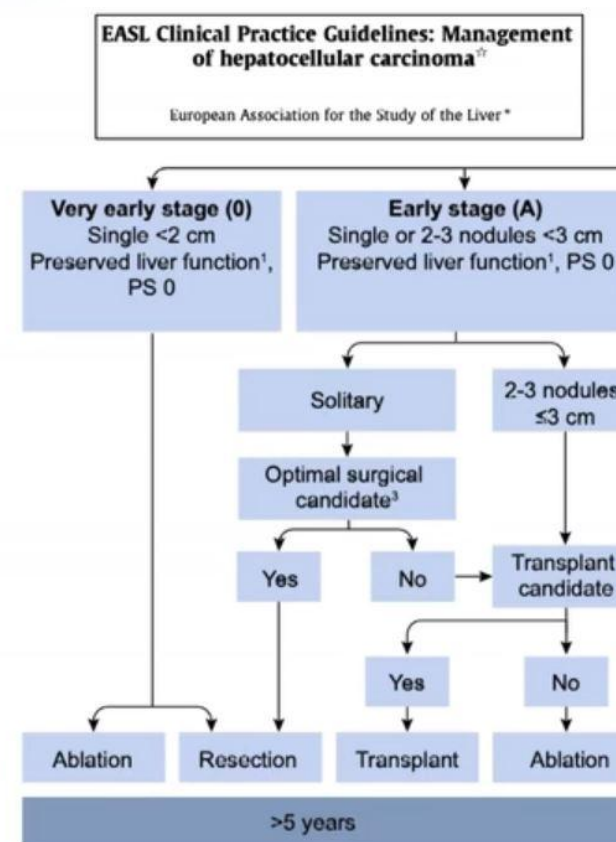
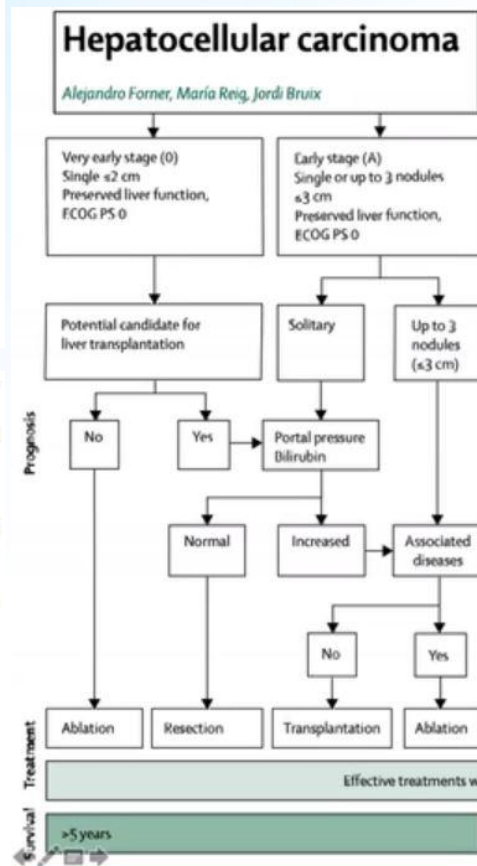
Published online: April 26, 2019

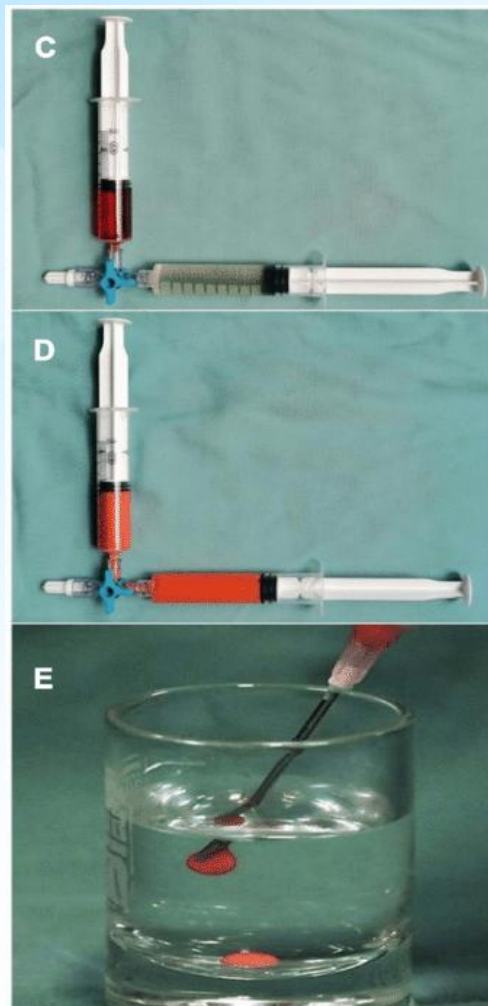
DOI: <https://doi.org/10.3350/cmh.2019.0016>

Ultrasensitive conventional transarterial chemoembolization: When and how?

Shiro Miyayama

Ultrasensitive conventional transarterial chemoembolization (cTACE), defined as cTACE at the most distal portion of the subsegmental hepatic artery, is mainly performed for hepatocellular carcinoma (HCC) ≤ 5 cm. Distal advancement of a microcatheter enables injection of a larger volume of iodized oil into the portal vein in the limited area under non-physiological hemodynamics. As a result, the reversed portal flow into the tumor through the drainage route of the tumor that occurs when the hepatic artery is embolized is temporarily blocked. By adding gelatin sponge slurry embolization, both the hepatic artery and portal vein are embolized and not only complete necrosis of can be achieved. Ultrasensitive cTACE can cure small HCCs including less hypervascular tumor portions and replace surgical resection and radiofrequency ablation in selected patients.





Drop-test in Lipiodol

- Ratio Lipiodol/ doxorubicin: 3/1
- Doxorubicin concentration: 20 mg/ml

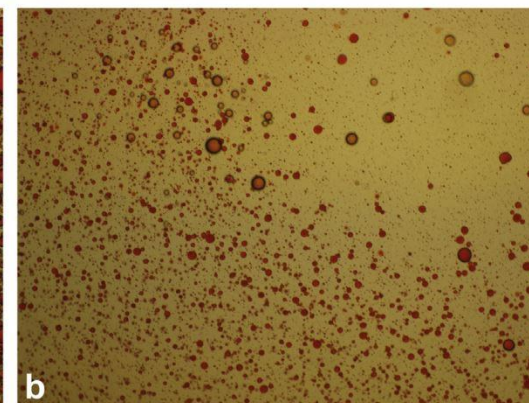
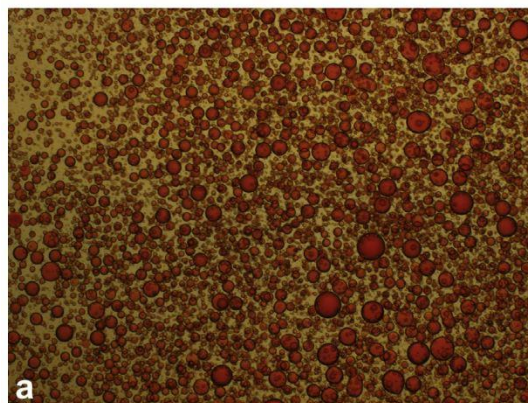
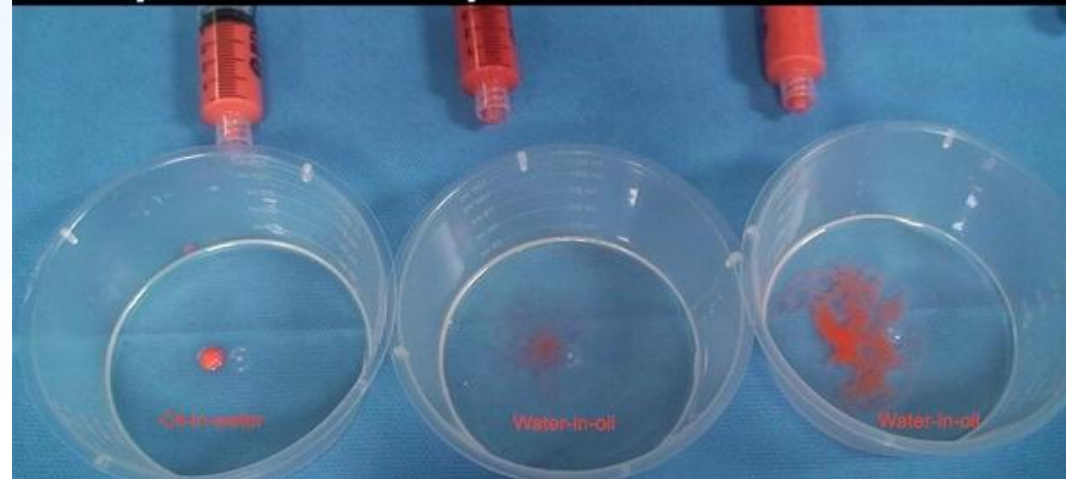


Table 3

Stability and classification of the emulsions with aqueous-to-lipid ratio of 1:1 and 1:4 determined with visual inspection and drop test.

Emulsion type	W/L		S/L		I/L		IW/L	
Aqueous-to-lipid ratio	1:1	1:4	1:1	1:4	1:1	1:4	1:1	1:4
Time								
15 min	-	+	-	+	+	+	+	+
Drop test (o/w or w/o)	-	w/o	-	w/o	o/w	w/o	o/w	w/o
30 min DLS	-	-	-	-	+	+	+	+
1 h	-	-	-	-	+	+	+	+
72 h	-	-	-	-	-	-	-	+

+ maintained emulsion, - separated emulsion, w/o water-in-oil, o/w oil-in-water. For information on the composition of the emulsions, see [Table 1](#).

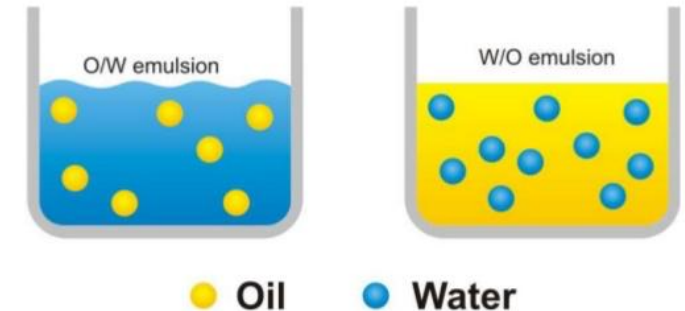
EMULSION TYPES:

OIL-IN-WATER EMULSION:

- Oil phase dispersed in water

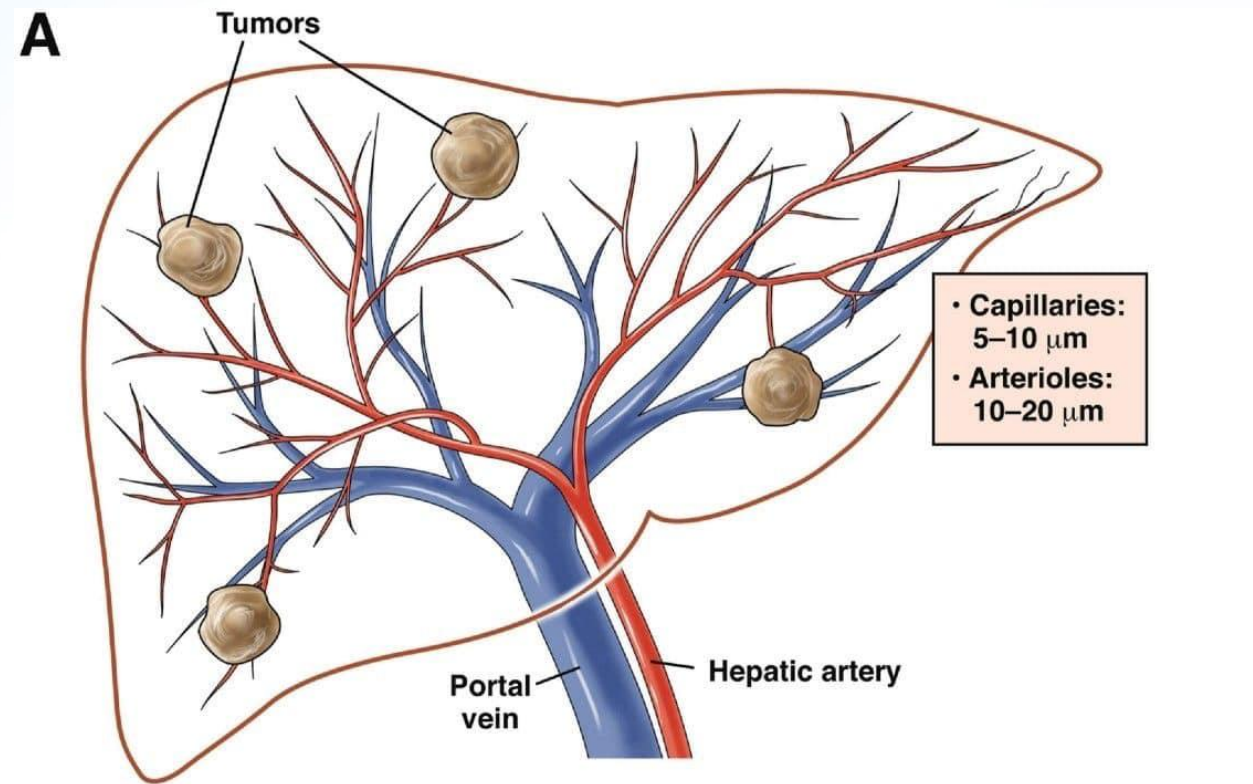
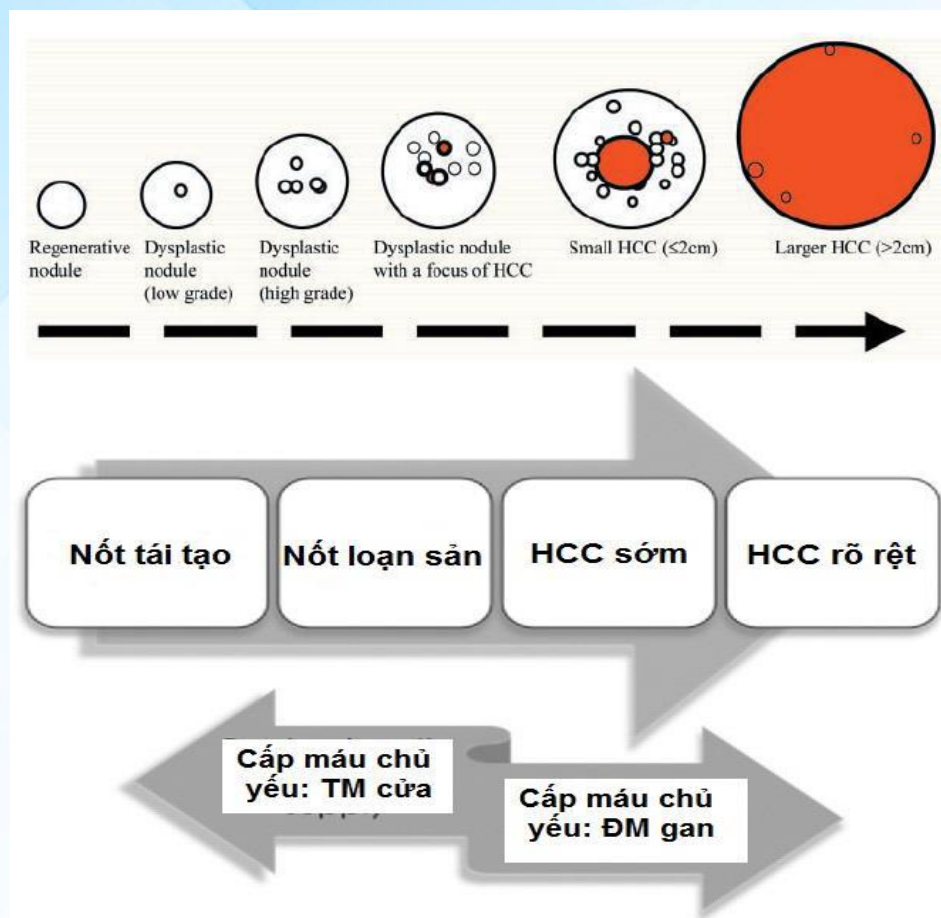
WATER-IN-OIL EMULSION:

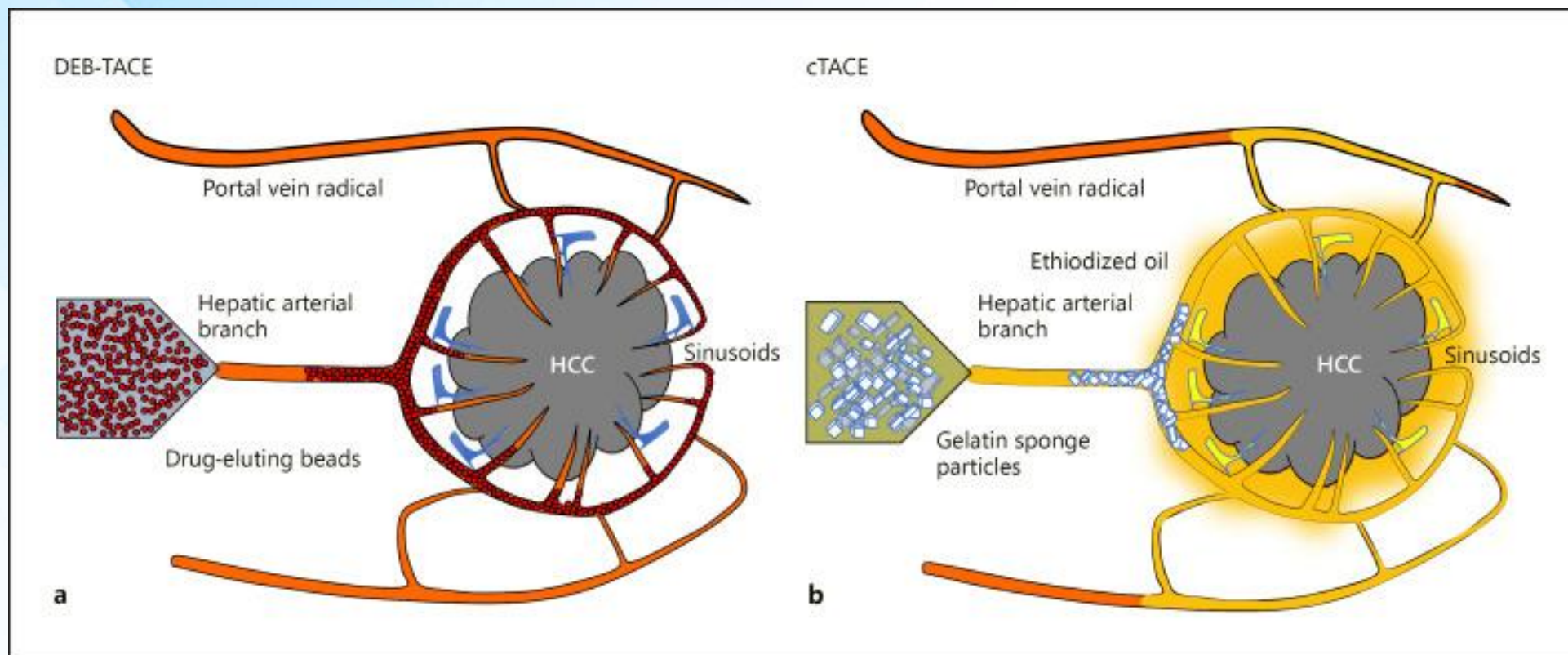
- Water phase dispersed in oil



					
CE Mark	2003	2007	2012	2015	2017
Manufacturer	BTG	Merit Medical	Boston Scientific	Terumo	BTG
Chemistry	PVA SO ₃ - groups	PVA-acrylate CO ₂ - groups	PMA core / Perfluor. shell CO ₂ - groups	PEG SO ₃ - groups	PVA SO ₃ - groups Iodine
Size range (μm)	75 to 700	120 to 800 *	40 to 100	100 to 400	75 to 300
Drug loaded **	Doxorubicin Irinotecan	Doxorubicin Irinotecan	Doxorubicin Irinotecan	Doxorubicin Irinotecan	Doxorubicin Irinotecan
DOX Loading	37.5 mg /mL	37.5 mg/mL	50 mg/mL	50 mg/mL	37.5 mg /mL
IRI Loading	50 mg/mL	50 mg/mL	50 mg/mL	50 mg/mL	50 mg/mL







ĐỒNG THUẬN CHUYÊN GIA VỀ ĐIỀU TRỊ UNG THƯ BIỂU MÔ TẾ BÀO GAN BẰNG PHƯƠNG PHÁP TẮC MẠCH HÓA CHẤT ĐƯỜNG ĐỘNG MẠCH

4.1. Lựa chọn cTACE hay DebTACE hoặc phối hợp phụ thuộc vị trí, kích thước mạch máu từng khối u, từng bệnh nhân riêng biệt và điều kiện tại cơ sở thực hiện:

- *Chỉ định cTACE: ưu thế trong các trường hợp khối u nằm trong tiêu chí up-to-7 (đường kính u 3-6cm, số lượng dưới 4 nốt)*
- *Chỉ định DEBTACE: ưu thế trong các trường hợp khối u nằm ngoài tiêu chí up-to-7 (đường kính u 3-6cm, số lượng dưới 4 nốt) hoặc chức năng gan kém (child-pugh B8, B9)*





Research | [Open access](#) | [Published: 26 May 2022](#)

Bridging treatment prior to liver transplantation for hepatocellular carcinoma: radioembolization or transarterial chemoembolization?

[Tamás Benkö](#), [Julia König](#), [Jens M. Theysohn](#), [Clemens Schotten](#), [Fuat H. Saner](#), [Jürgen Treckmann](#) & [Sonia Radunz](#) ✉

Intraarterial bridging treatment leading to tumor necrosis may not only prevent waitlist drop-out but also facilitate long-term successful liver transplantation in HCC patients. Both radioembolization and TACE represent potent treatment strategies.



> [World J Gastroenterol. 2019 Oct 7;25\(37\):5687-5701. doi: 10.3748/wjg.v25.i37.5687.](#)

Long-term outcomes of hepatocellular carcinoma that underwent chemoembolization for bridging or downstaging

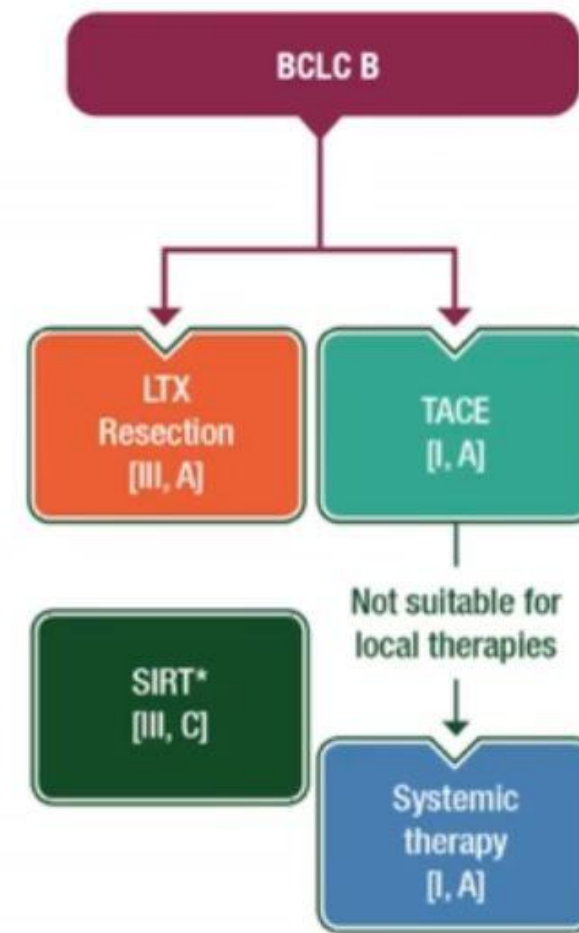
[Breno Boueri Affonso](#)¹, [Francisco Leonardo Galastri](#)², [Joaquim Mauricio da Motta Leal Filho](#)², [Felipe Nasser](#)², [Priscila Mina Falsarella](#)², [Rafael Noronha Cavalcante](#)², [Marcio Dias de Almeida](#)³, [Guilherme Eduardo Gonçalves Felga](#)³, [Leonardo Guedes Moreira Valle](#)², [Nelson Wolosker](#)⁴

Conclusion: Tumors initially exceeding the MC down-staged after DEB-TACE, can achieve post-transplant survival and HCC recurrence-free probability, at five years, just like patients within MC in patients undergoing DEB-TACE.

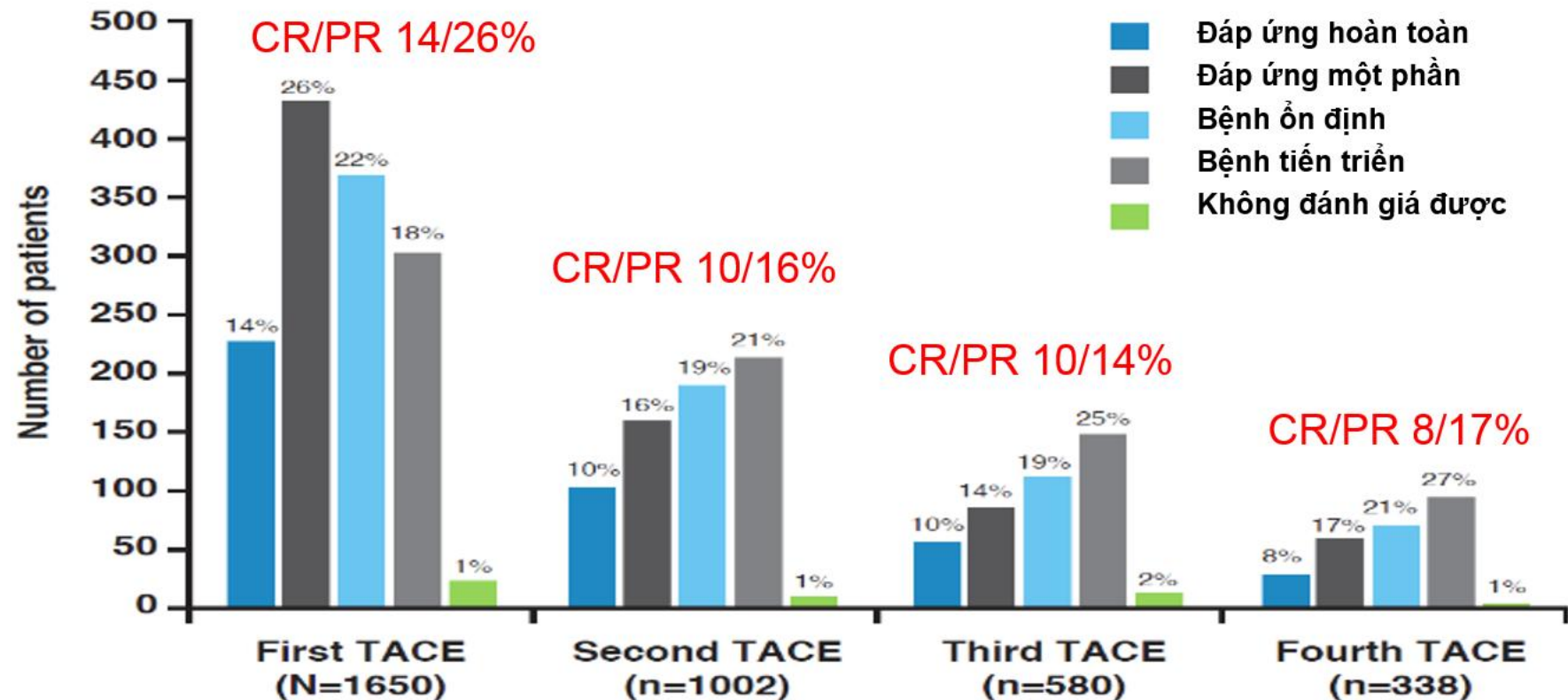
TACE failure/refractoriness ?

TACE unsuitable ?

EUROPEAN SOCIETY
FOR MEDICAL ONCOLOGY



Đáp ứng khối u trên hình ảnh đối với từng đợt TACE

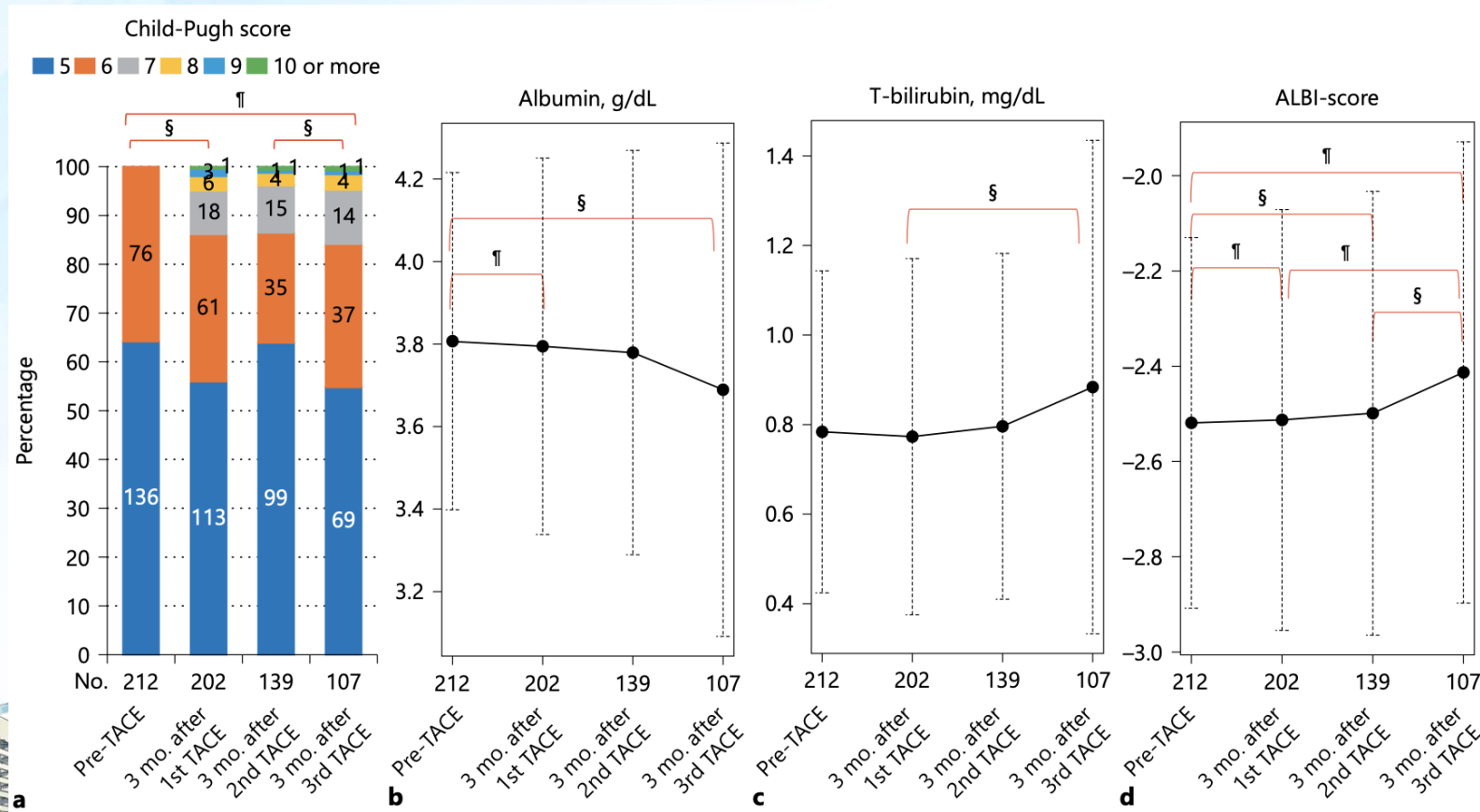


Data are presented for the first 4 TACE procedures only; fewer than 15% of the total population received more than 4 TACE procedures.

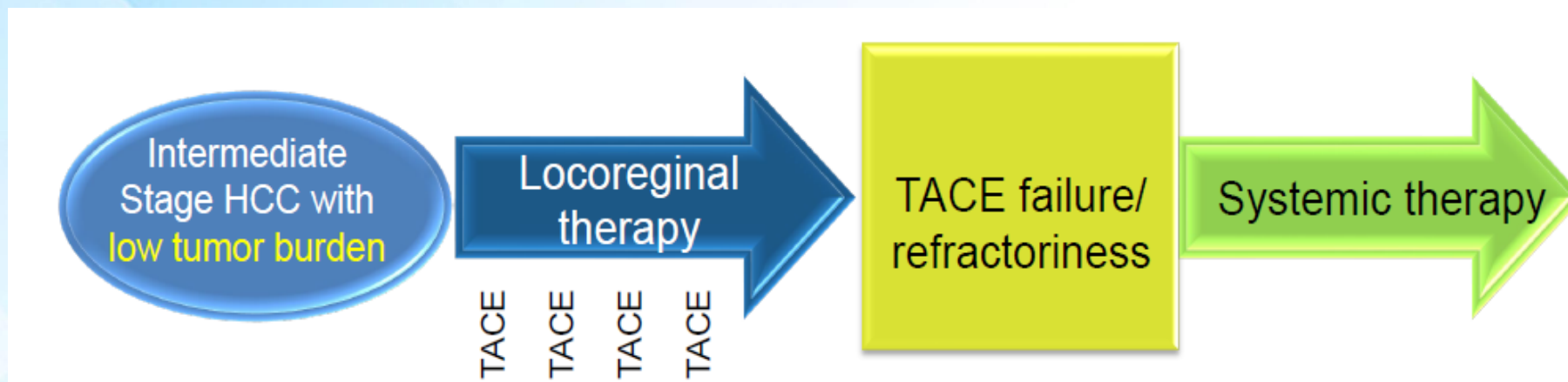
TACE, transarterial chemoembolization.



Tại thời điểm 3 tháng sau mỗi lần TACE, khoảng 15% bệnh nhân có điểm Child-Pugh tăng từ A sang B hoặc hơn



Changes in (a) Child-Pugh score, (b) serum albumin, (c) total-bilirubin, (d) and ALBI-score during clinical course of BCLC-B HCC patients with Child-Pugh A who underwent repeated TACE procedures.



Đồng thuận: Ngay sau khi có dấu hiệu **kháng TACE** thì việc chuyển sang điều trị đích là chìa khóa kéo dài **thời gian sống còn của bệnh nhân** (theo kết quả từ nghiên cứu Optimis và 2 nghiên cứu hồi cứu khác)

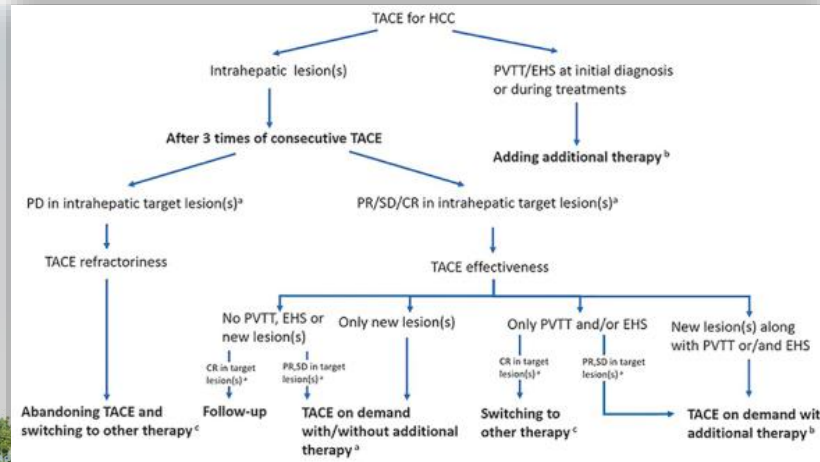


TACE failure/refractoriness: Nhật – Trung – Việt Nam

Table 1. Definition of TACE failure/refractoriness (LCSGJ)

- (1) Intrahepatic lesion
 - i Two or more consecutive insufficient responses of the treated tumor (viable lesion >50%) even after changing the chemotherapeutic agents and/or reanalysis of the feeding artery seen on response evaluation CT/MRI at 1–3 months after having adequately performed selective TACE
 - ii Two or more consecutive progressions in the liver (tumor number increases as compared to tumor number before the previous TACE procedure) even after having changed the chemotherapeutic agents and/or reanalysis of the feeding artery seen on response evaluation CT/MRI at 1–3 months after having adequately performed selective TACE
- (2) Continuous elevation of tumor markers immediately after TACE even though slight transient decrease is observed
- (3) Appearance of vascular invasion
- (4) Appearance of extrahepatic spread

Transarterial chemoembolization refractoriness in hepatocellular carcinoma: Chinese College of Interventionalists definition and consensus statement



- *Tổn thương trong gan Sau ≥ 2 TACE không hiệu quả (phần u hoạt động > 50%), kể cả sau khi thay đổi về vật liệu nút và đánh giá lại các động mạch nuôi u. Đánh giá bằng CT hoặc CHT sau 1 – 3 tháng. U vẫn tiếp tục tiến triển sau ≥ 2 lần TACE và chụp lại (kích thước và số lượng) so với lần TACE ngay trước.*

- *Chỉ số u: Tiếp tục tăng ngay sau TACE, thậm chí có giảm tạm thời ít sau đó tăng lại*

- *U xâm lấn mạch máu*

- *U di căn ngoài gan*



APSCVIR
ASIA PACIFIC SOCIETY OF CARDIOVASCULAR AND INTERVENTIONAL RADIOLOGY

Oncology 2014;87(6):330-41

DOI: 10.1159/000365993



Asia-Pacific Primary Liver Cancer Expert (APPLE) consensus statement for patients with intermediate-stage HCC

Consensus Statement 9:

TACE-unsuitability is defined as each one of the following 3 clinical conditions that prevent a survival benefit from TACE or conditions that TACE is even harmful:

(i) Unlikely to respond to TACE:

- Confluent multinodular type, massive or infiltrative type, simple nodular type with extranodular growth, poorly differentiated type, intrahepatic multiple disseminated nodules, or sarcomatous changes after TACE

(ii) Likely to develop TACE failure/refractoriness:

- Up-to-7 criteria out nodules

(iii) Likely to become Child-Pugh B or C after TACE:

- Up-to-7 criteria out nodules (especially, bilobar multifocal HCC)
- mALBI grade 2b

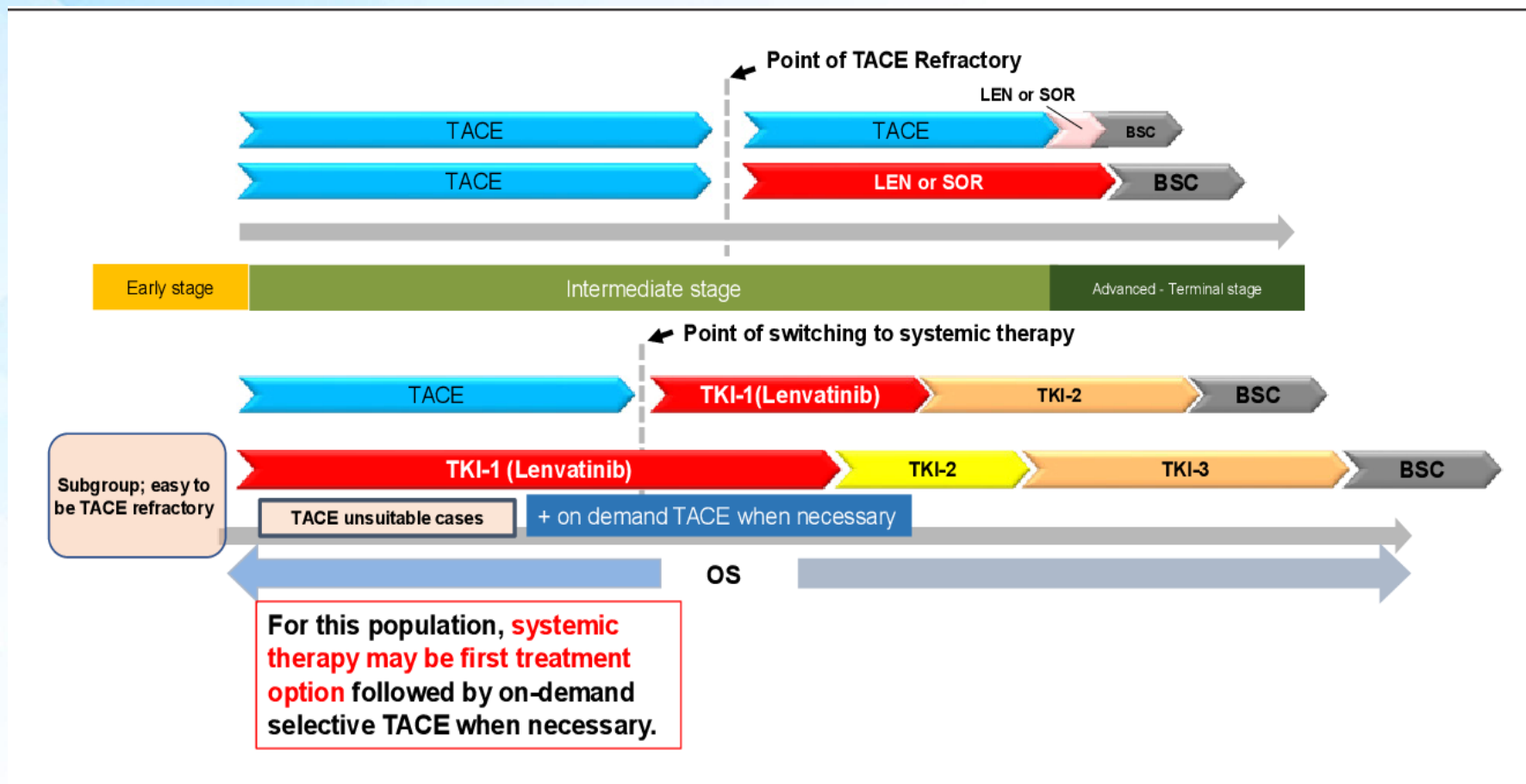
TACE không phù hợp gồm các trường hợp

- Hầu như sẽ kháng TACE: Vượt qua “up to 7 criteria”
- Hầu như sẽ chuyển sang Child Pugh C sau TACE: Vượt qua “up to 7 criteria” (đặc biệt là nhiều nốt hai thùy), mALBI 2b.
- Hầu như không đáp ứng với TACE: Thể nhiều nốt tập trung lại, thể thâm nhiễm, nốt đơn độc có phát triển ra ngoài nốt, nhiều nốt lan tỏa, chuyển dạng sarcoma sau TACE.



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1/ Trans-arterial treatment

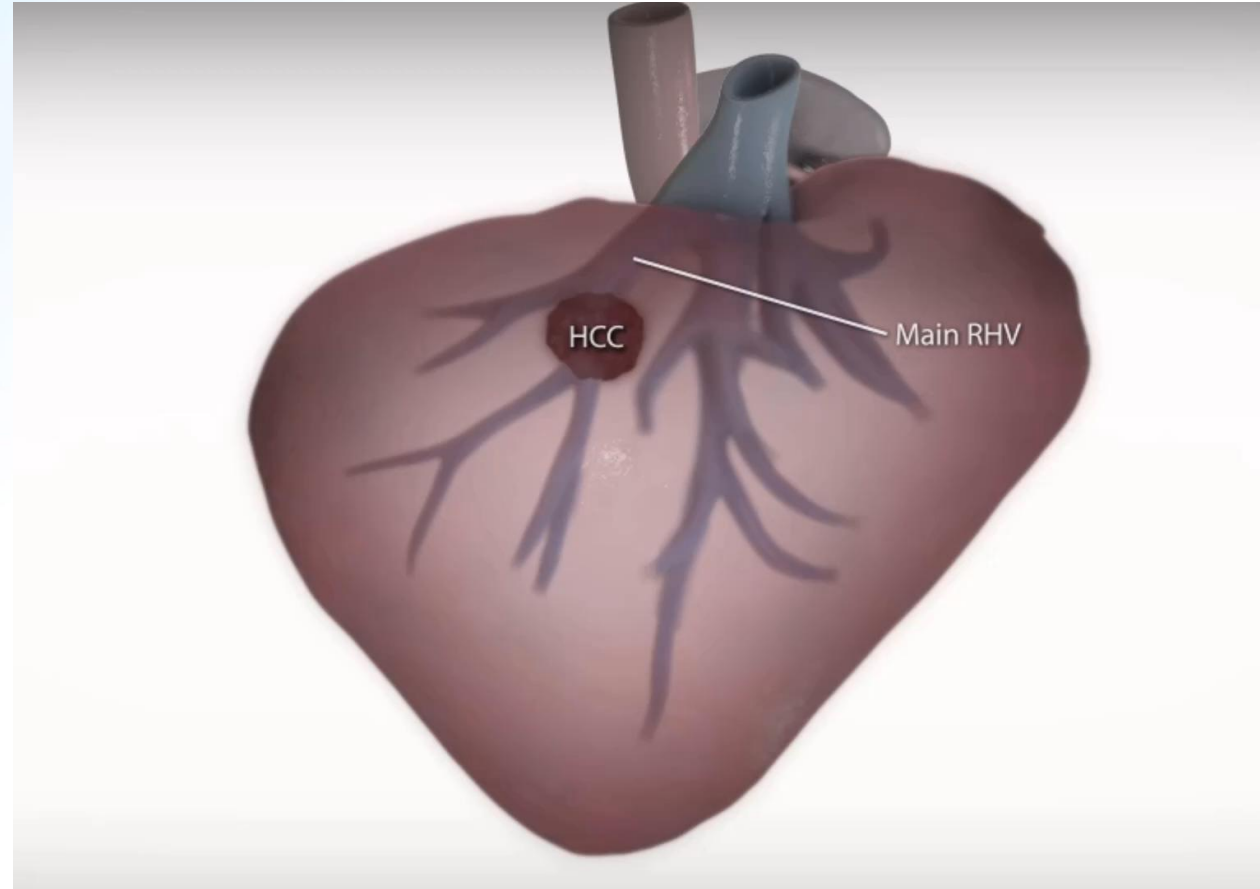
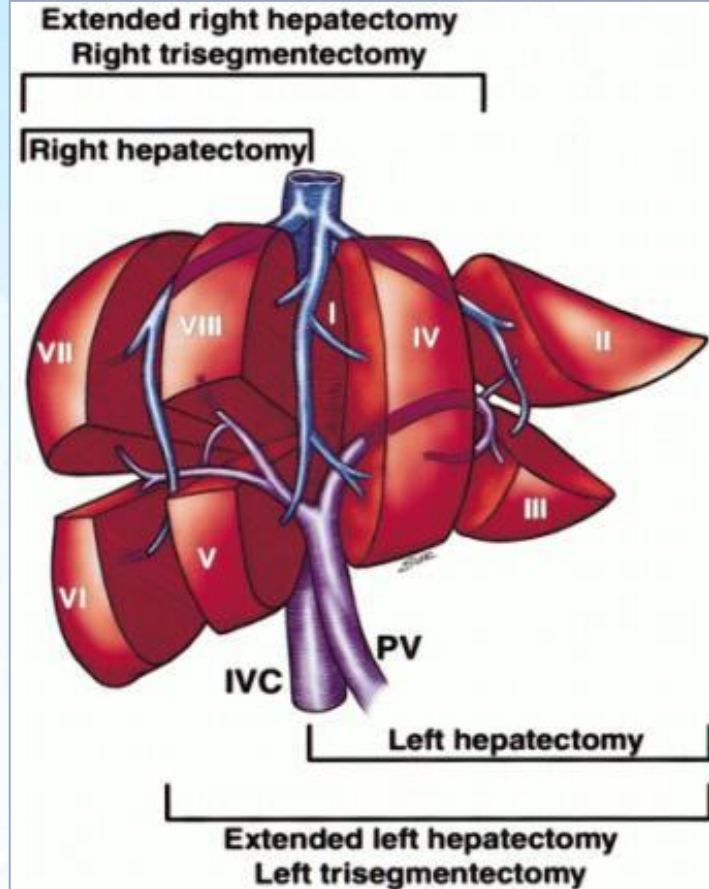
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2/ Trans-venous treatment

- Portal Vein Embolization (PVE)
- Liver vein deprivation (PVE + HVE)



2/ *Portal Vein Embolization (PVE)*



Why we need to perform PVE

- Hypertrophy of FLR
 - Reduce post-operative complications
 - Increase the number of pts able to undergo curative-intent liver surgery

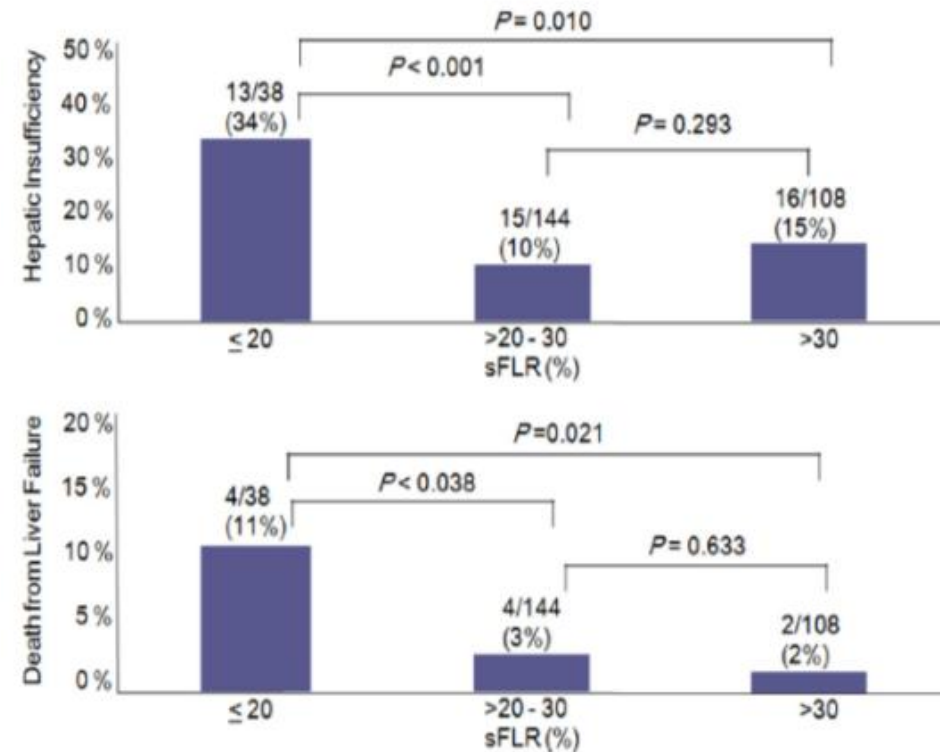
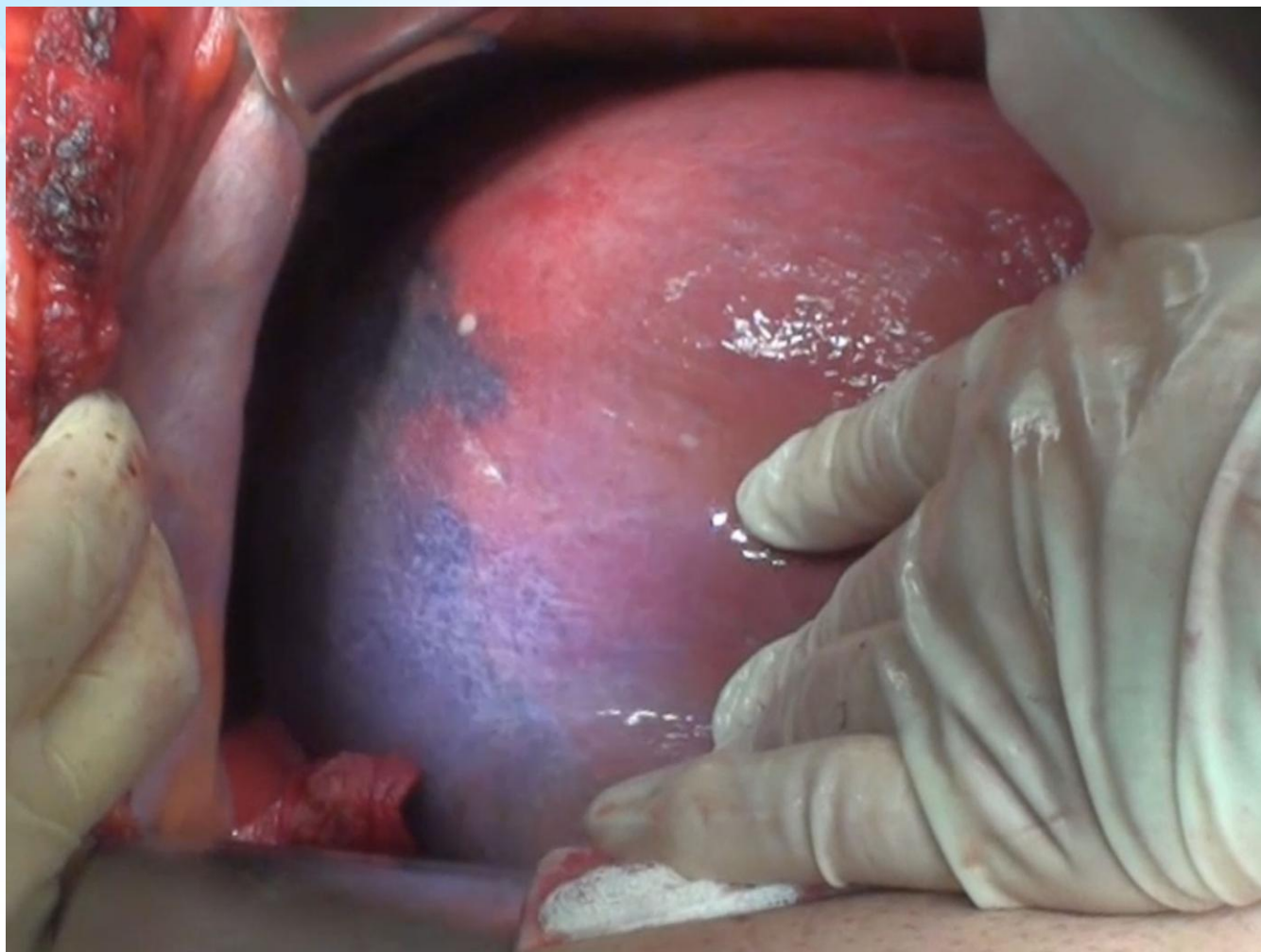


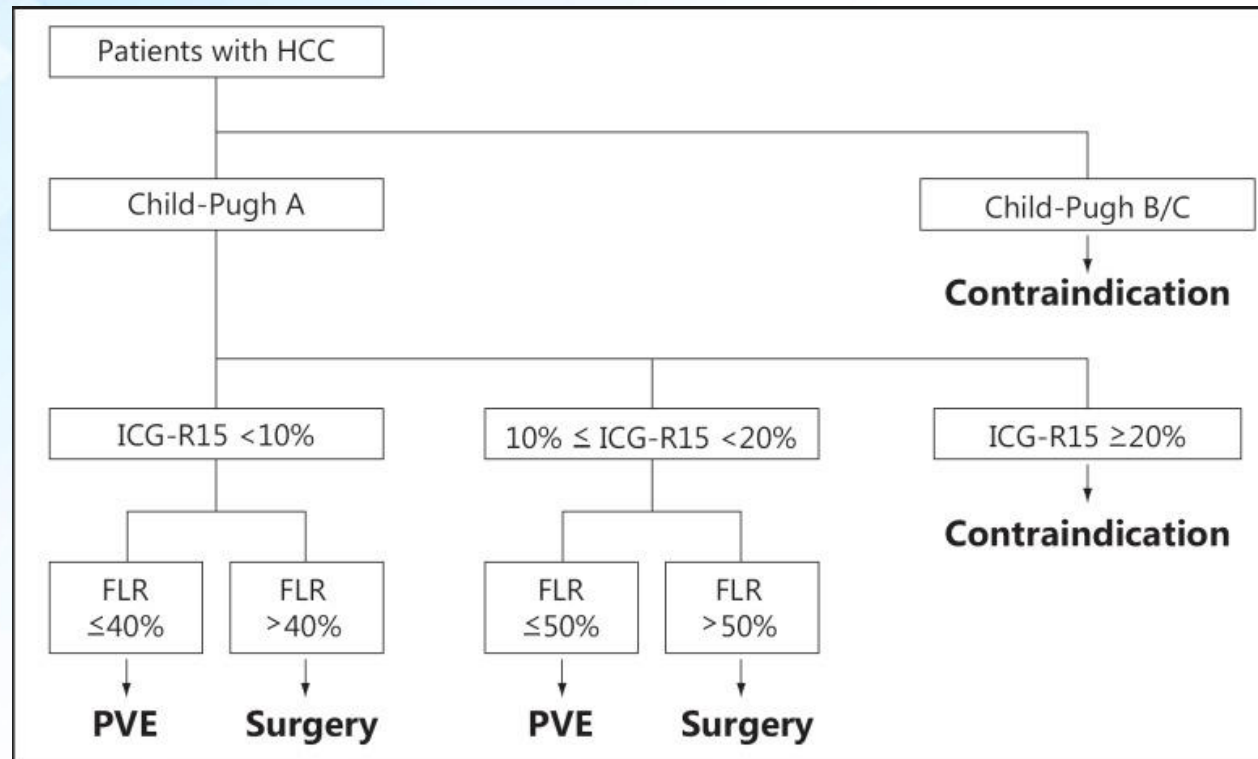
Figure 2. Rates of (a) hepatic insufficiency and (b) death by preoperative standardized FLR (sFLR) volume. (Adapted with permission from Kishi Y, Abdalla EK, Chun YS, et al. Three hundred and one consecutive extended right hepatectomies: evaluation of outcome based on systematic liver volumetry. Ann Surg 2009; 250:540–548.) (Available in color online at www.jvir.org.)





PVE indications & contraindications

- % of FLR/TELV:



Kubota K, Hepatology 1997
Madoff DC. JVIR 2005
Shindoh J. Liver Cancer 2012

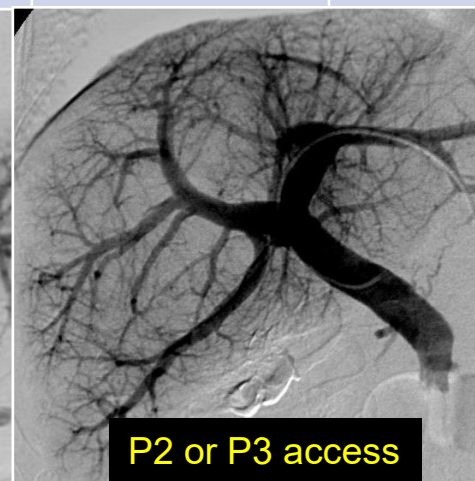
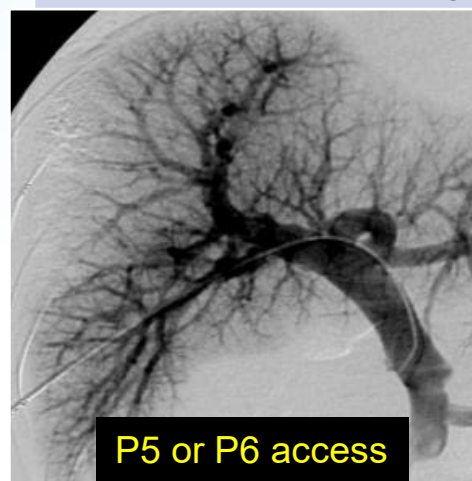


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UNIVERSITY MEDICAL CENTER HCMC
Thấu hiểu nỗi đau - niềm tin của bạn



bvdaihoc.com.vn 27

Access route	Ipsilateral PV	Contralateral PV	Trans-splenic
Injury to FLR	None	Possible	None
Initial access to venous system	Easy	Easy	Tricky
Catheter manipulation to right portal brs.	Difficult	Easy	Easy
Access to p4 brs.	Easy	Tricky sometimes	Easy
Use of NBCA	Tricky	Easy	Easy
Postemb. portography	Tricky	Easy	Easy
Risk of tumor seeding	Possible	None	None



The role of portal vein embolization in the surgical management of primary hepatobiliary cancers. A systematic review

[G.K. Glantzounis](#)   • [E. Tokidis](#) • [S.-P. Basourakos](#) • [E.E. Ntzani](#) • [G.D. Lianos](#) • [G. Pentheroudakis](#)

Published: May 31, 2016 • DOI: <https://doi.org/10.1016/j.ejso.2016.05.026> •  Check for updates

40 articles including **2144** pts

- The degree of hypertrophy: **9%** (in cirrhotic livers) vs **16 %** (in normal livers)
- Time intervals between PVE and surgery: median **23 days**
- Major complications: **0.76%**



[Home](#) > [Current Oncology Reports](#) > [Article](#)

Systematic Reviews and Meta-Analyses of Portal Vein Embolization, Associated Liver Partition and Portal Vein Ligation, and Radiation Lobectomy Outcomes in Hepatocellular Carcinoma Patients

Interventional Oncology (DC Madoff, Section Editor) | Published: 30 October 2021
Volume 23, article number 135, (2021) [Cite this article](#)

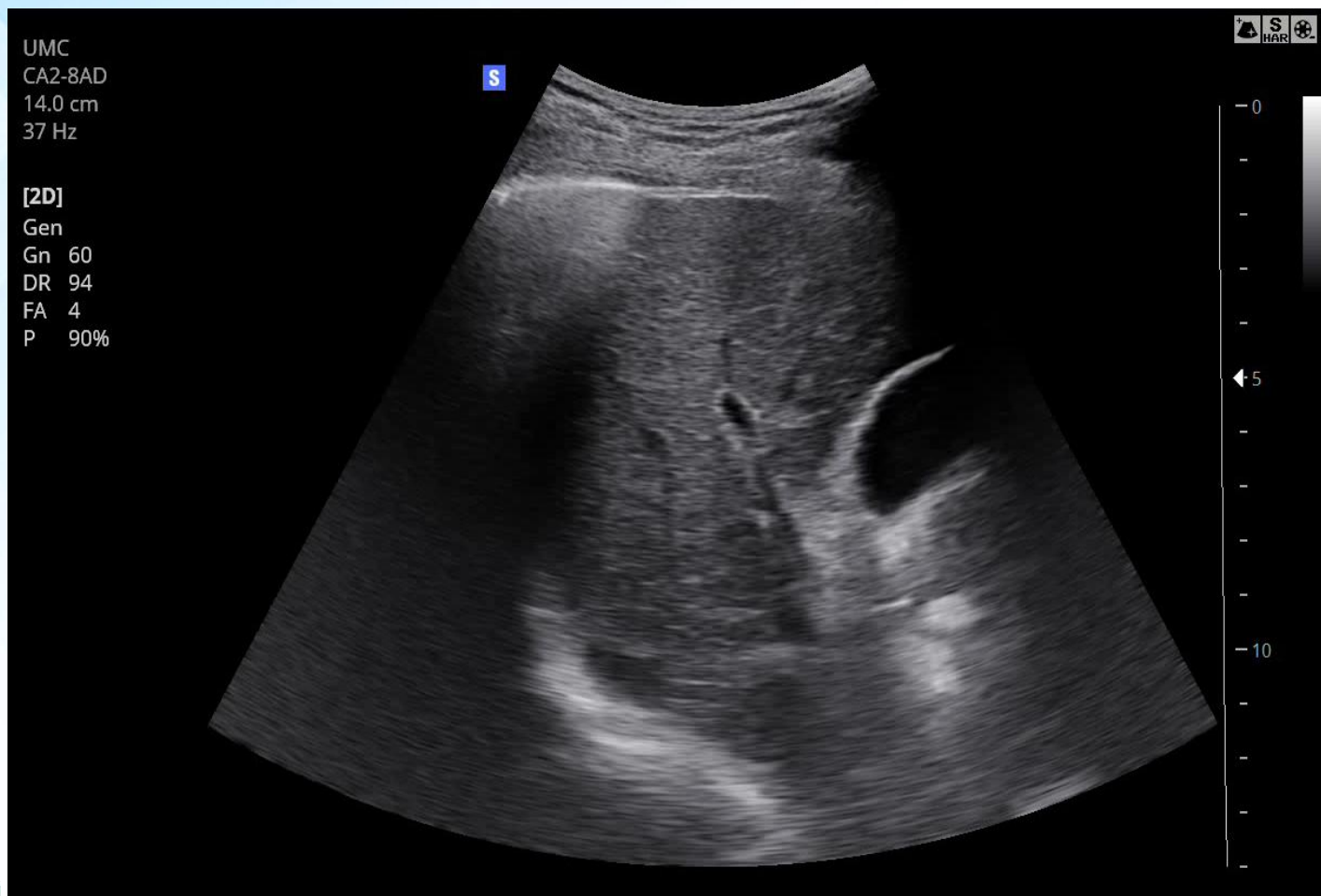
PVE

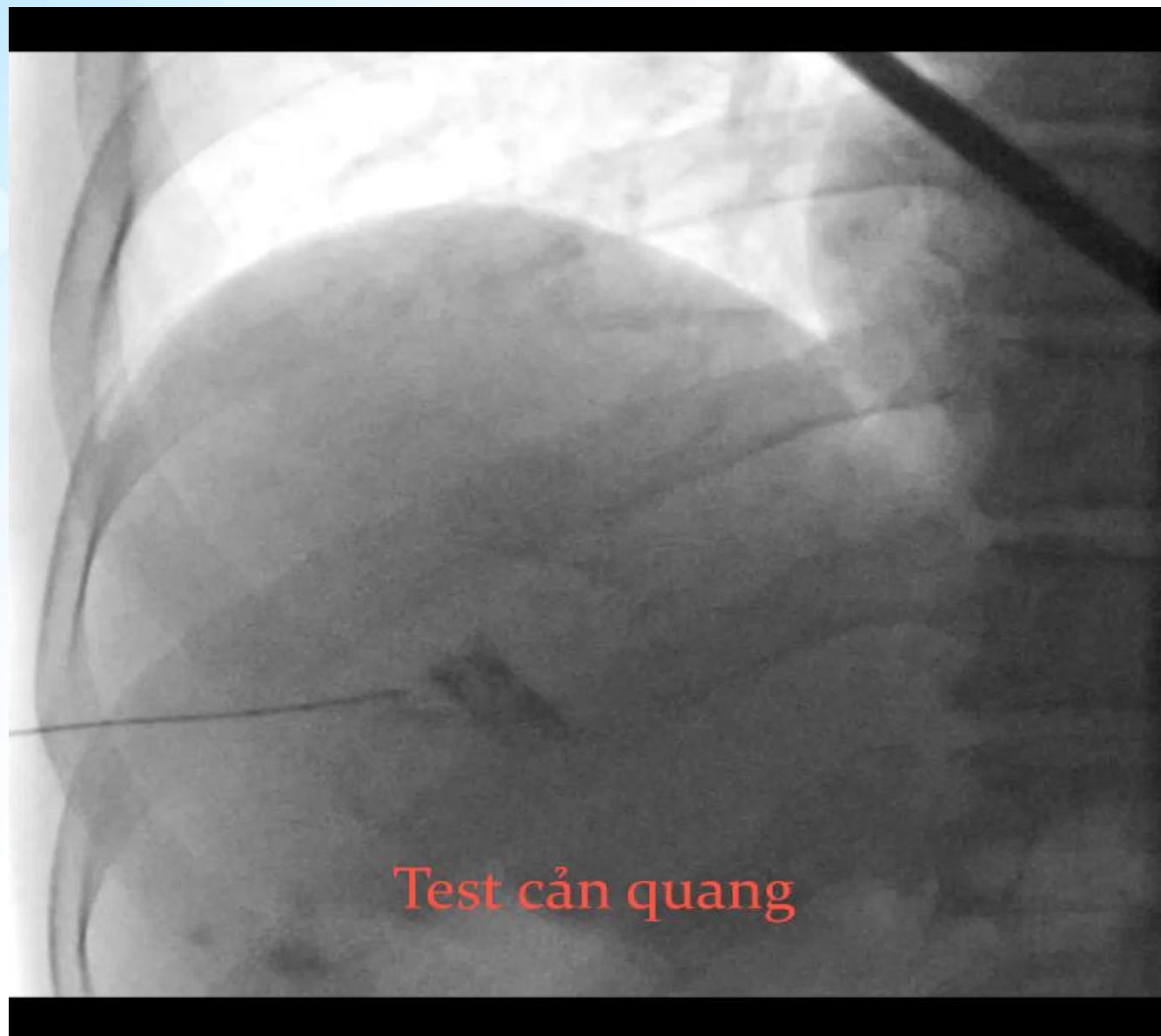
- Hepatectomy:
91%
- Time intervals:
40.3 days
 - Major complications
5%

ALPPS

- Hepatectomy:
98%
- Time intervals:
11.1 days
 - Major complications:
38%







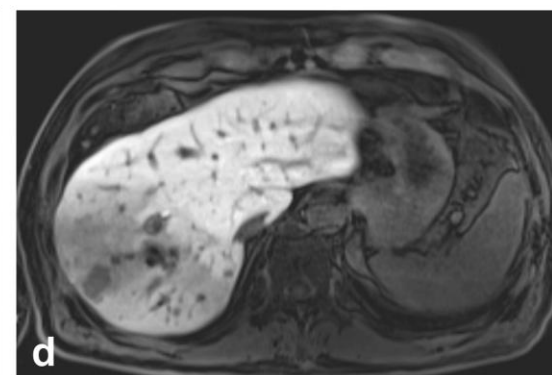
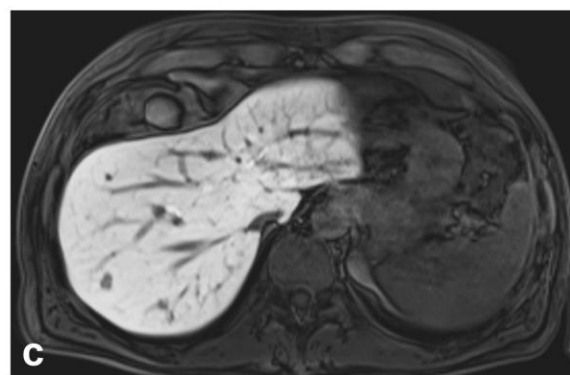
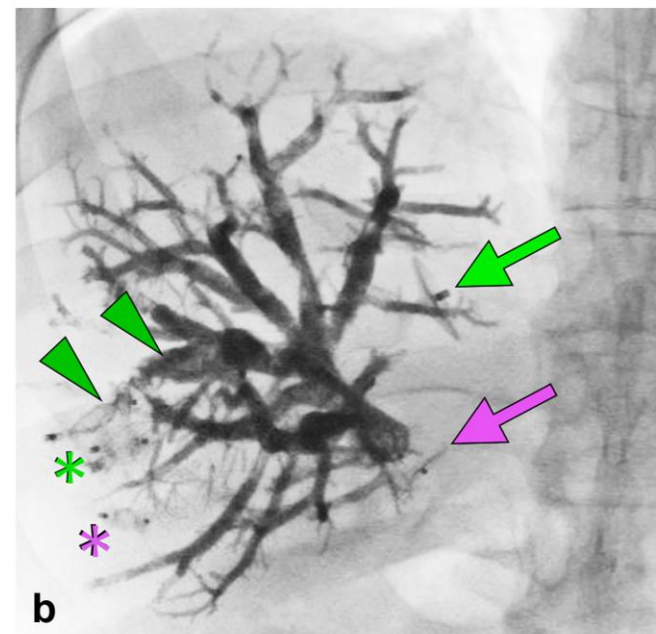
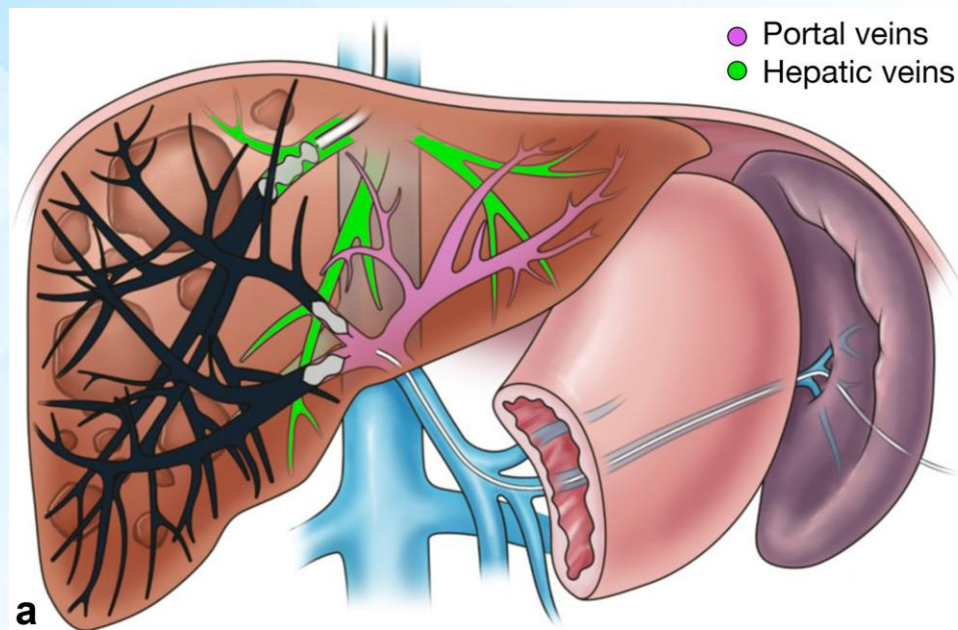
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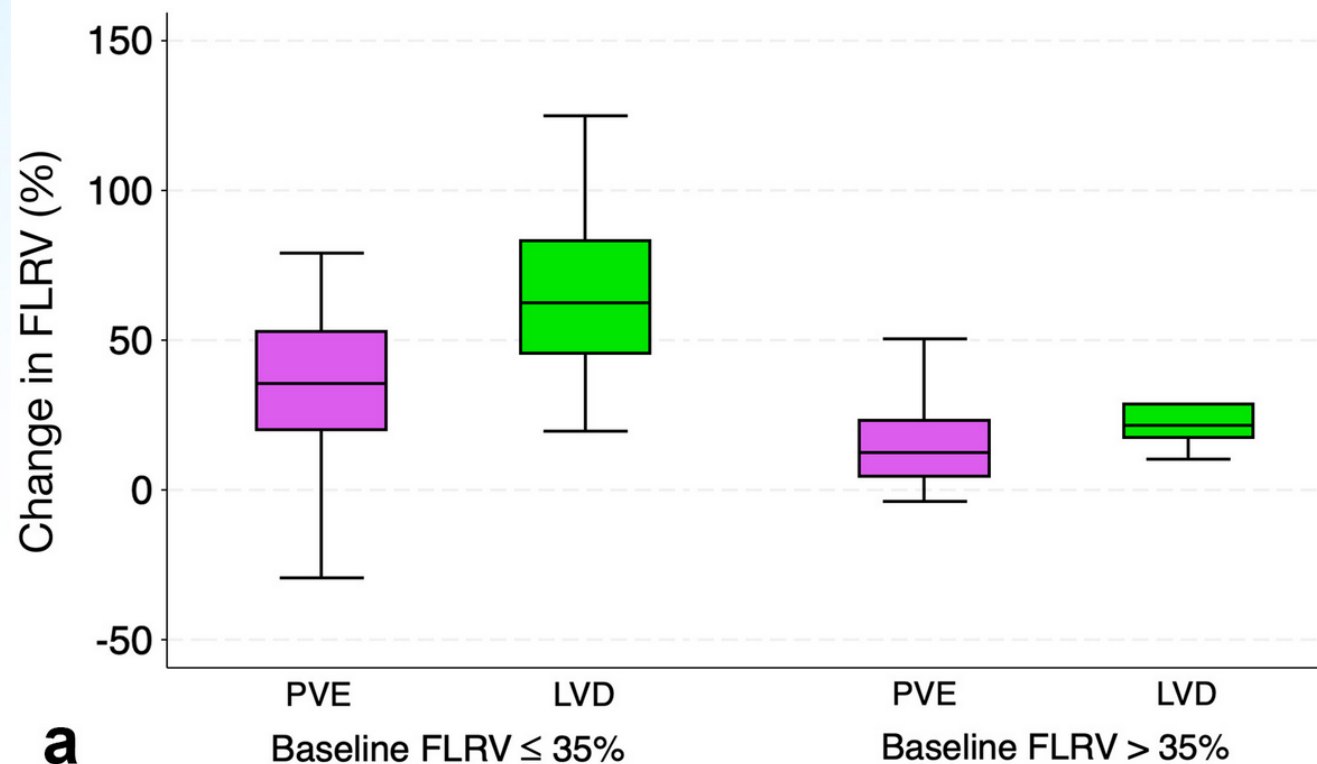
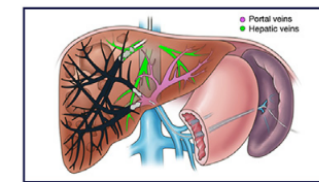
- Portal Vein Embolization (PVE)
- Liver vein deprivation (PVE + HVE)



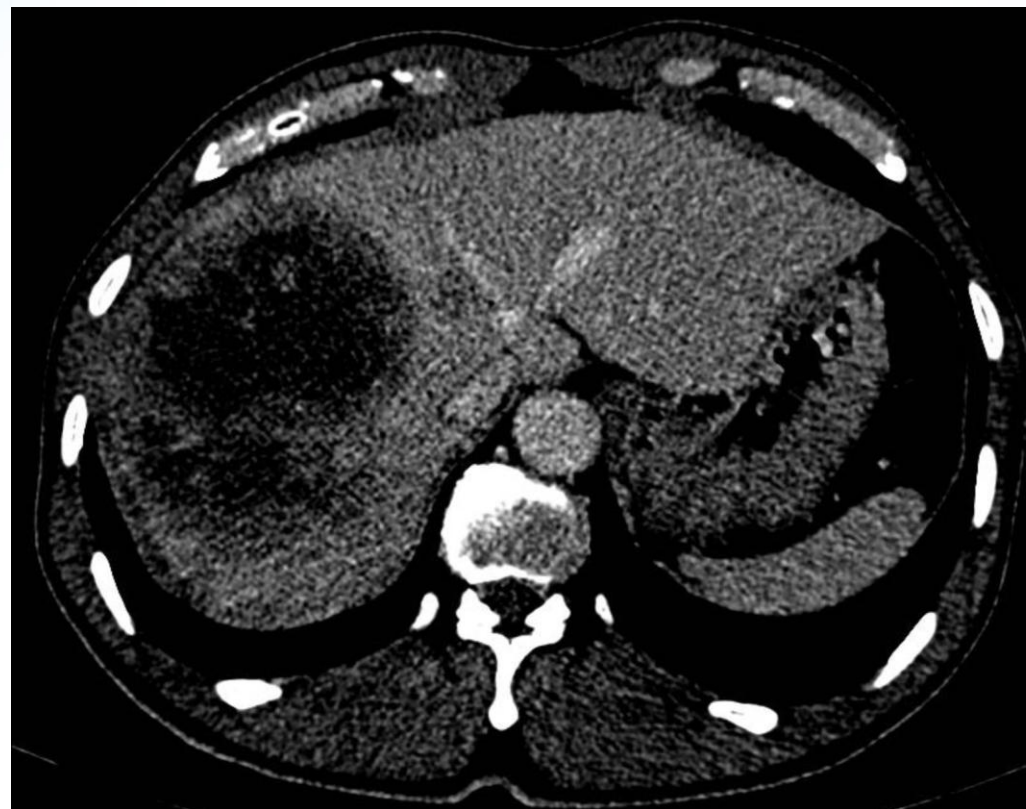
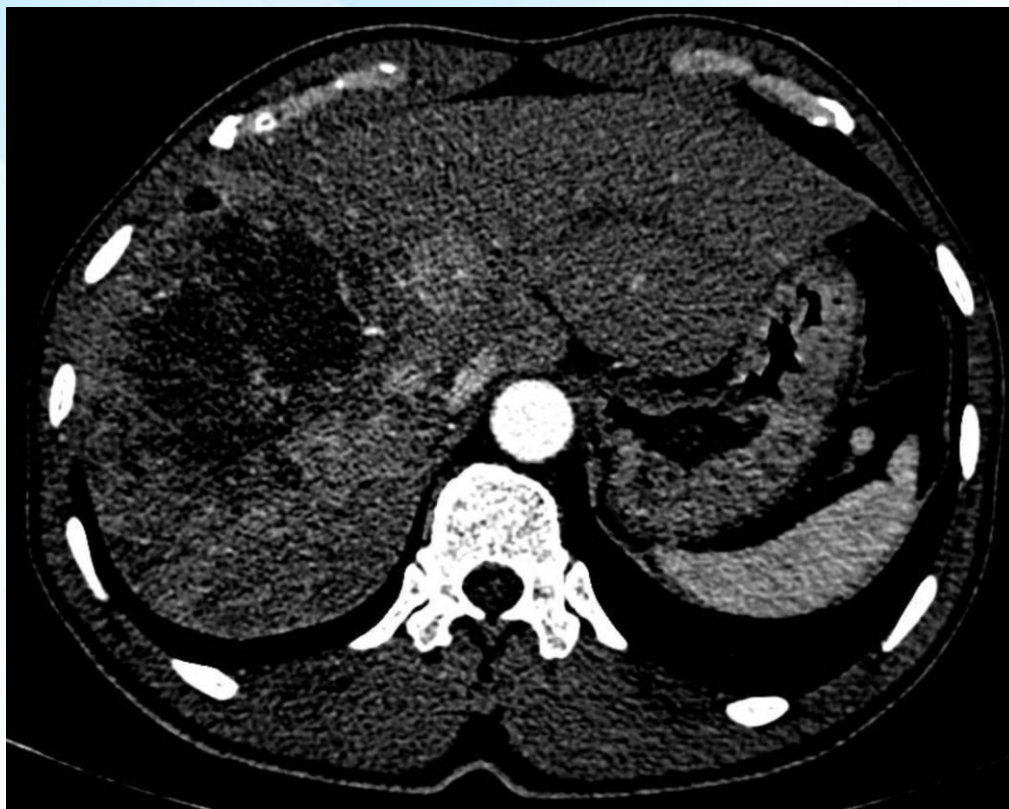


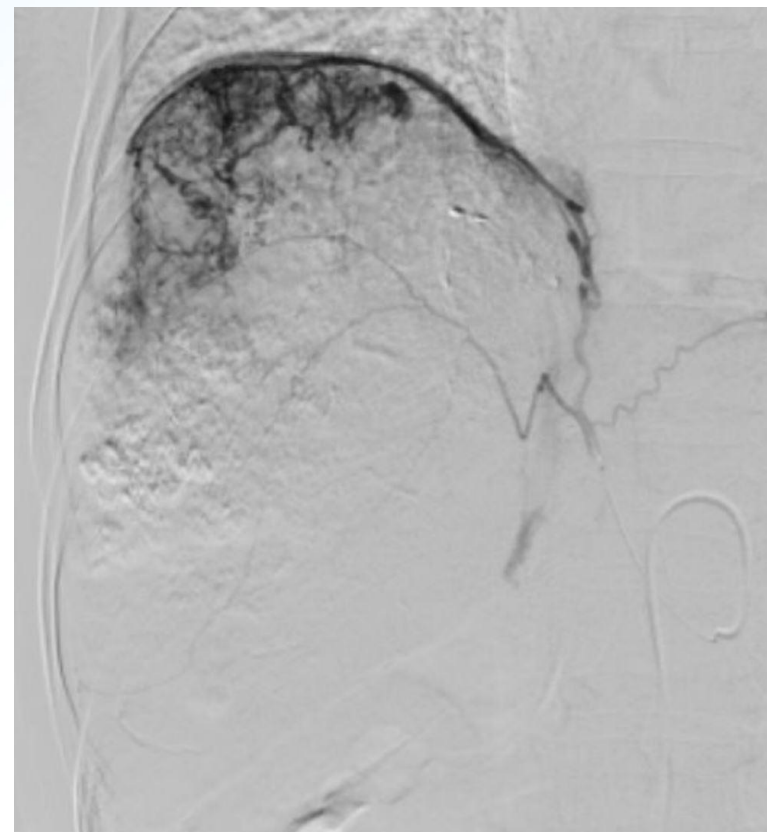
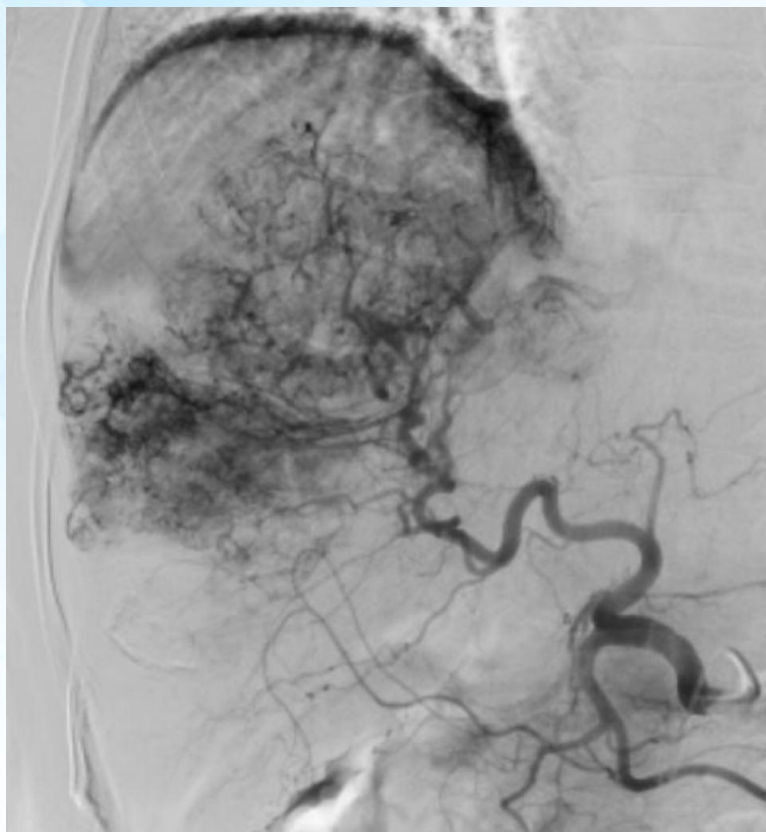
Liver Vein Deprivation versus Portal Vein Embolization: Retrospective Review of Safety and Effectiveness

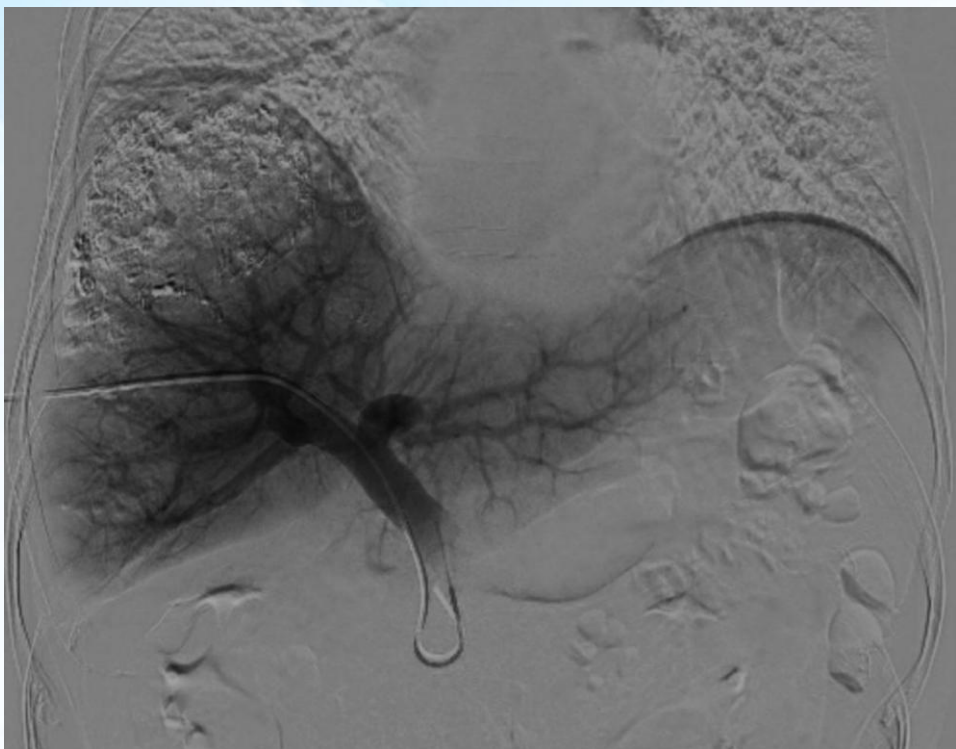
Sameer Gadani, MD, Jirapa Chansangrat, MD, Baljendra Kapoor, MD, Aaron McBride, MD, Sasan Partovi, MD, Nancy Obuchowski, PhD, David Choon Hyuck Kwon, MD, Federico Aucejo, MD, and Abraham Levitin, MD



A 55-year-old male, HBV, AFP (02/2019) > 1000 IU/mL, V gan# 25.4%, ChildPugh A



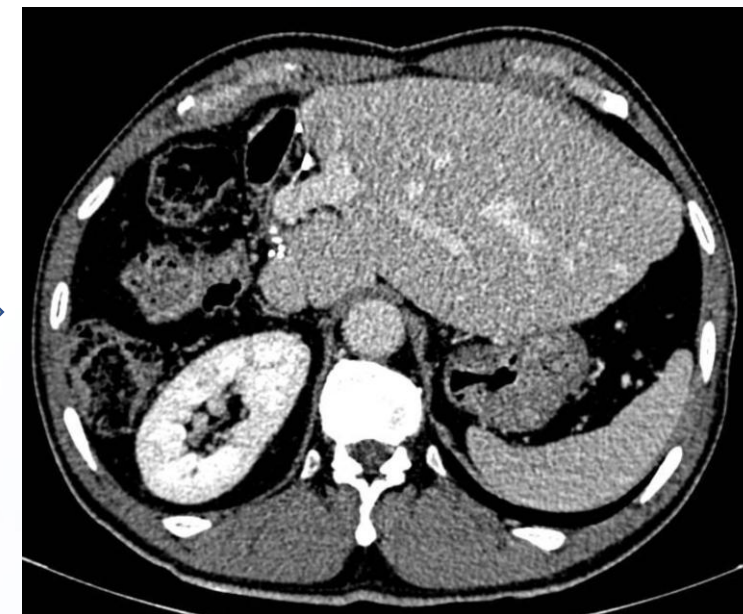
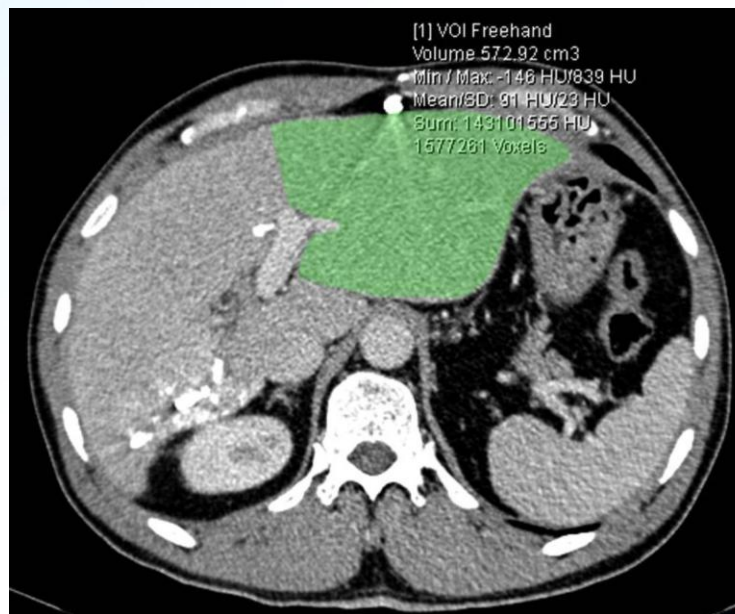




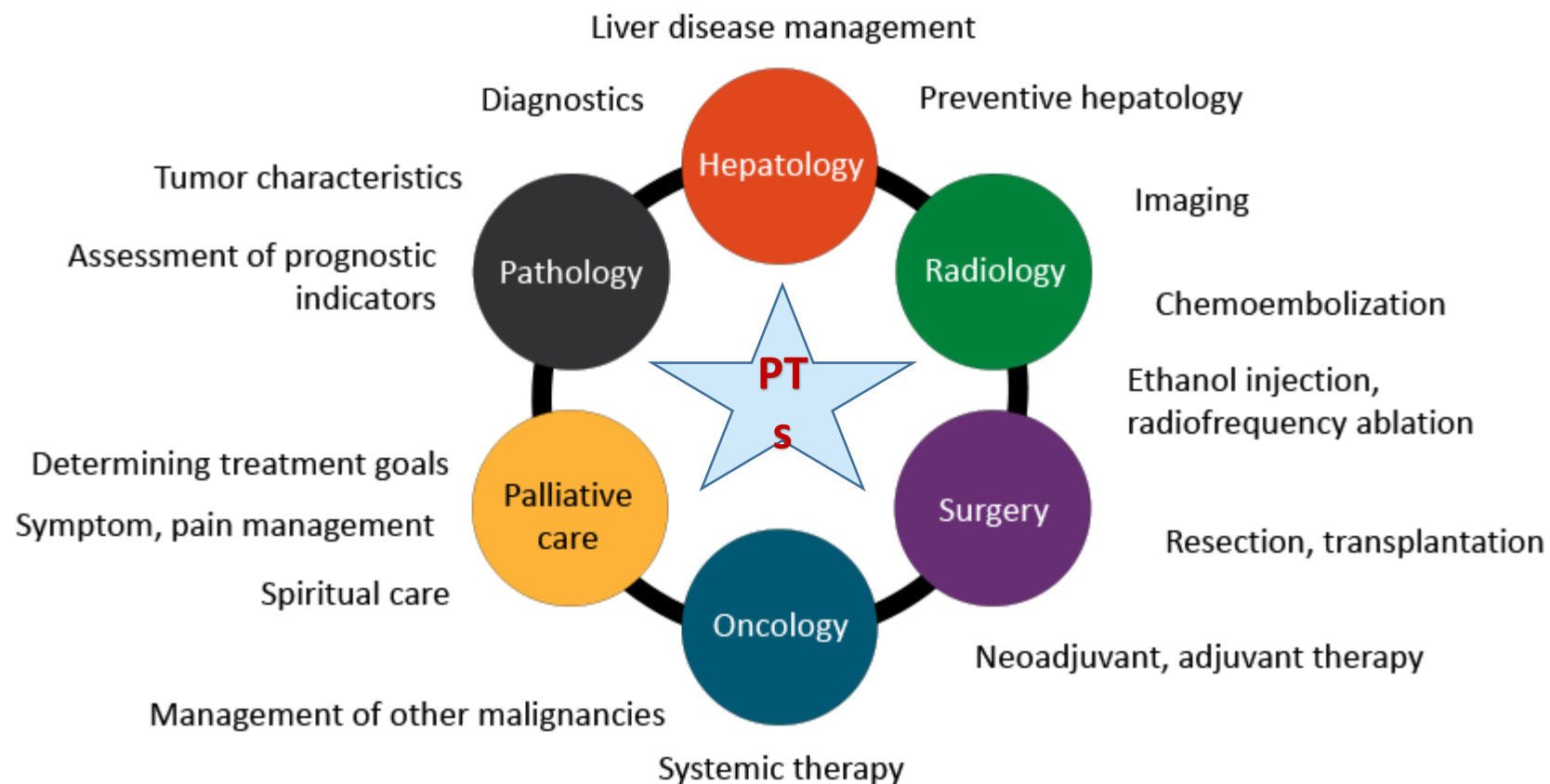
V gan# 25.4% -> 46.5%

02/2019

01/2014



Management of HCC: Multidisciplinary Team



van Leeuwen. Clin Liver Dis (Hoboken). 2015;6:122.



Thank you for your attention...

