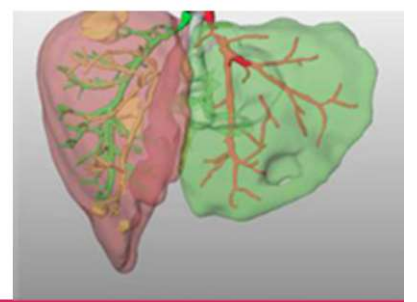




ALPPS

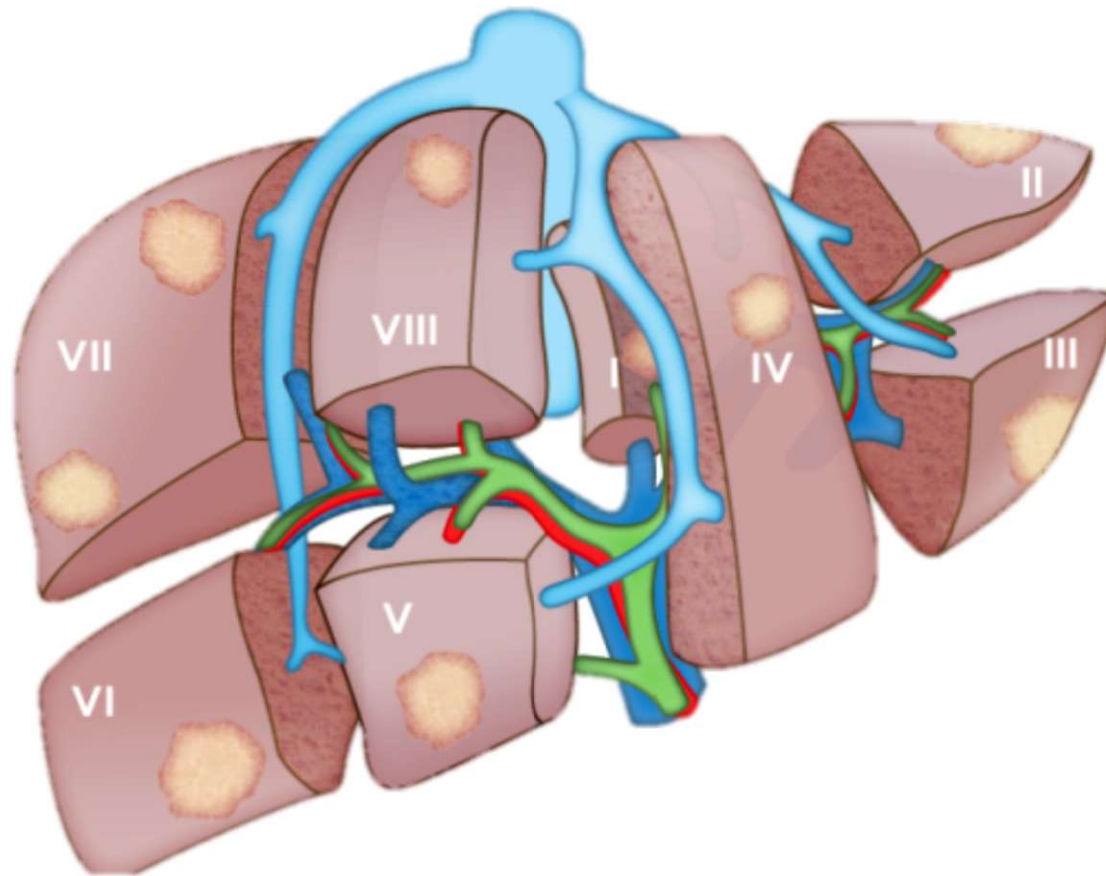
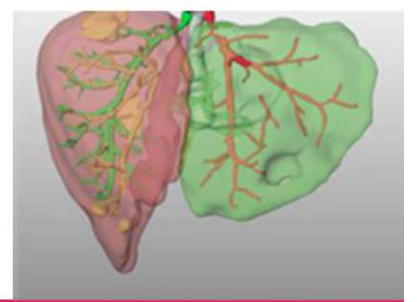
Orlando Jorge M. Torres
Professor Livre-Docente
Núcleo de Estudos do Fígado - UFMA

O Começo

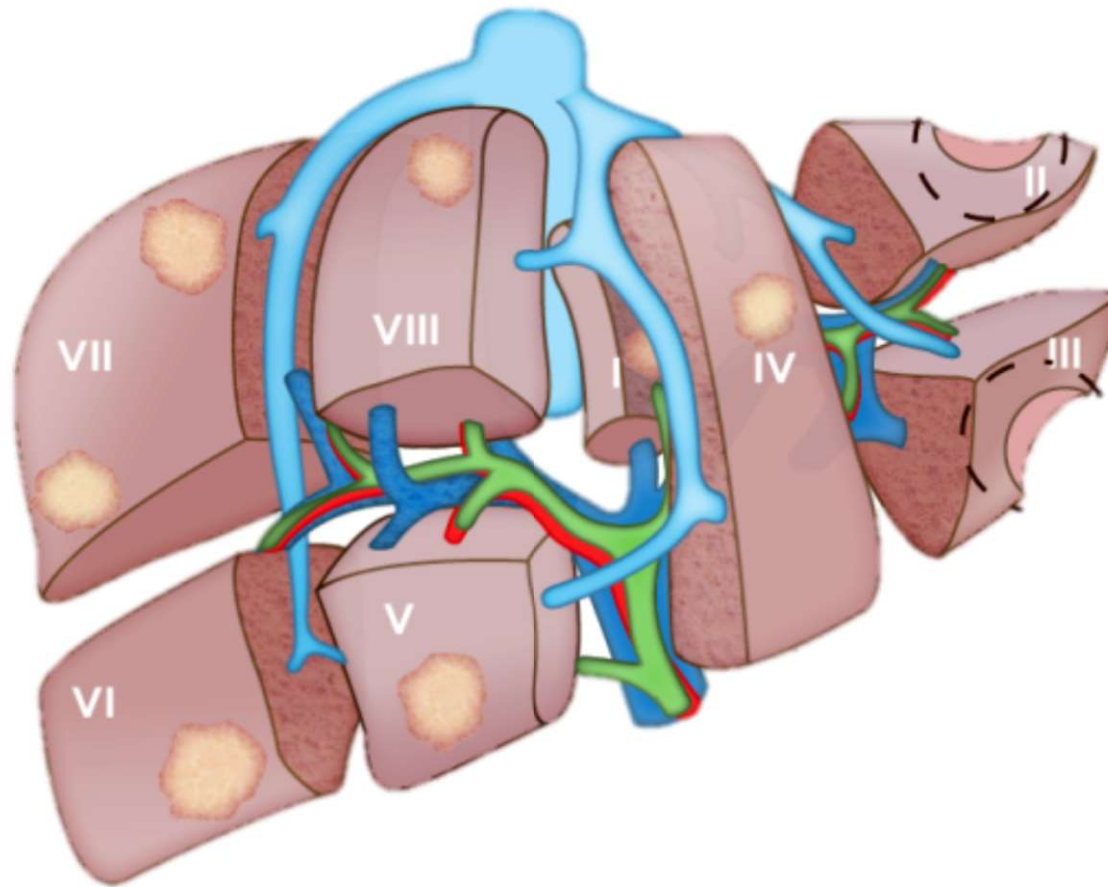
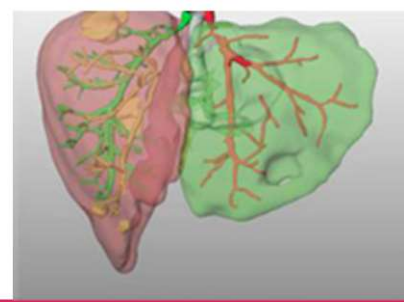


Hans Jurgen Schlitt
Regensburg University
Germany - 2007

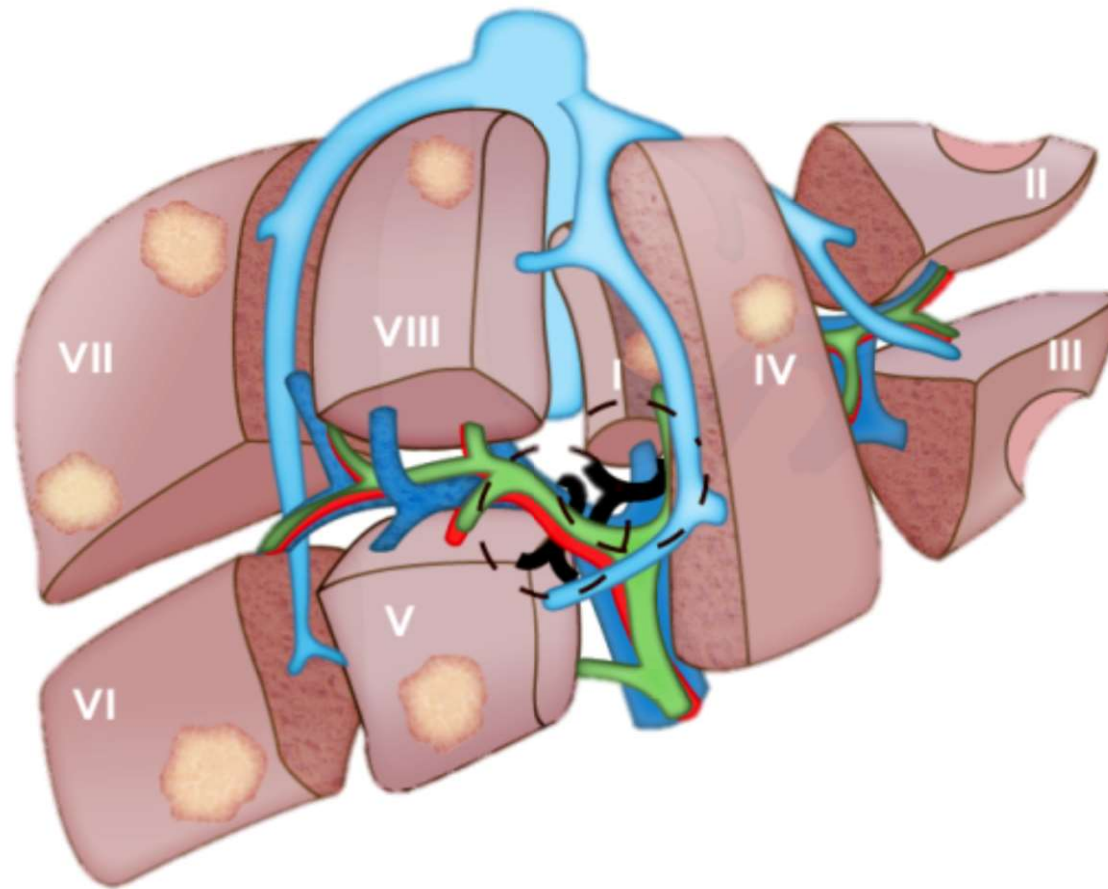
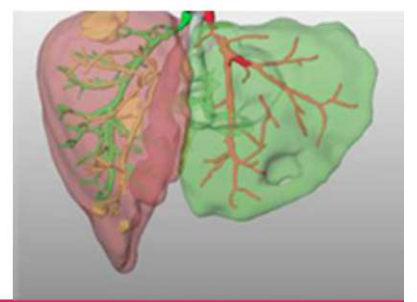
ALPPS



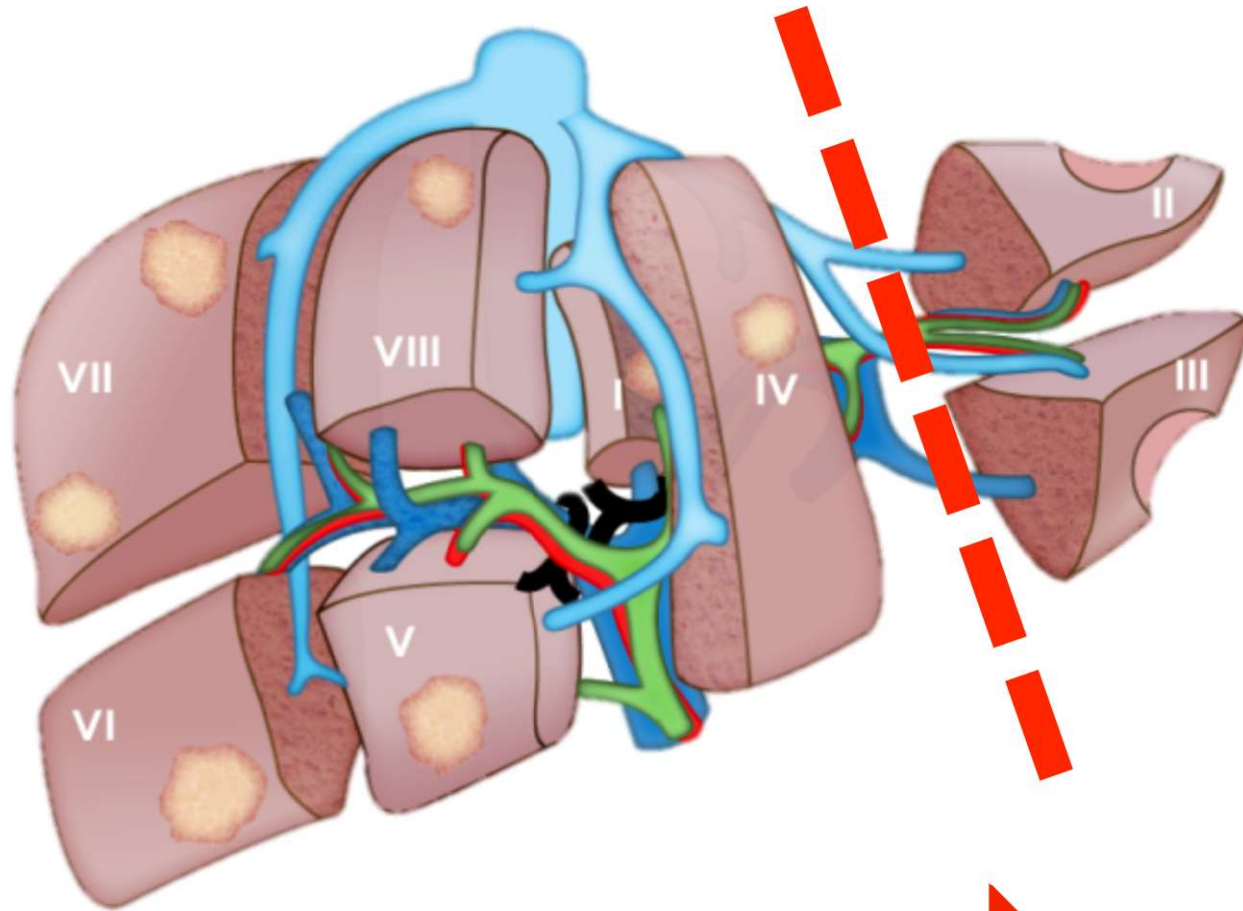
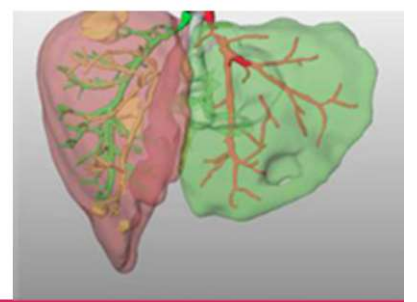
ALPPS



ALPPS

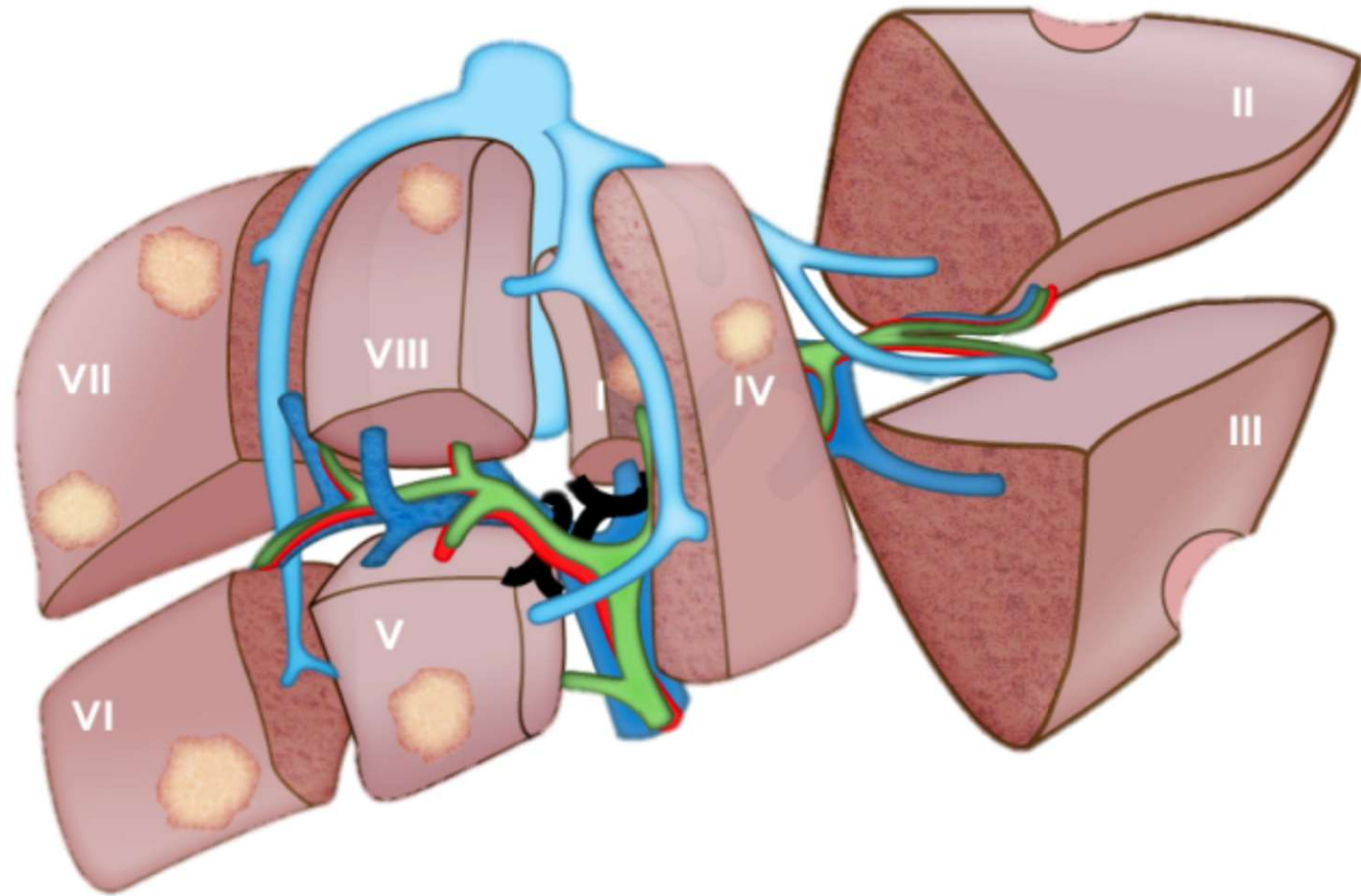
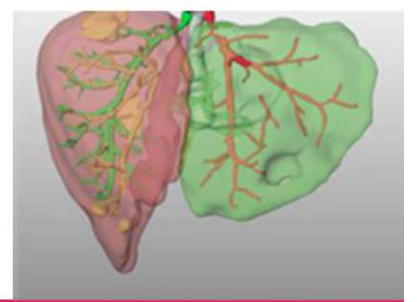


ALPPS

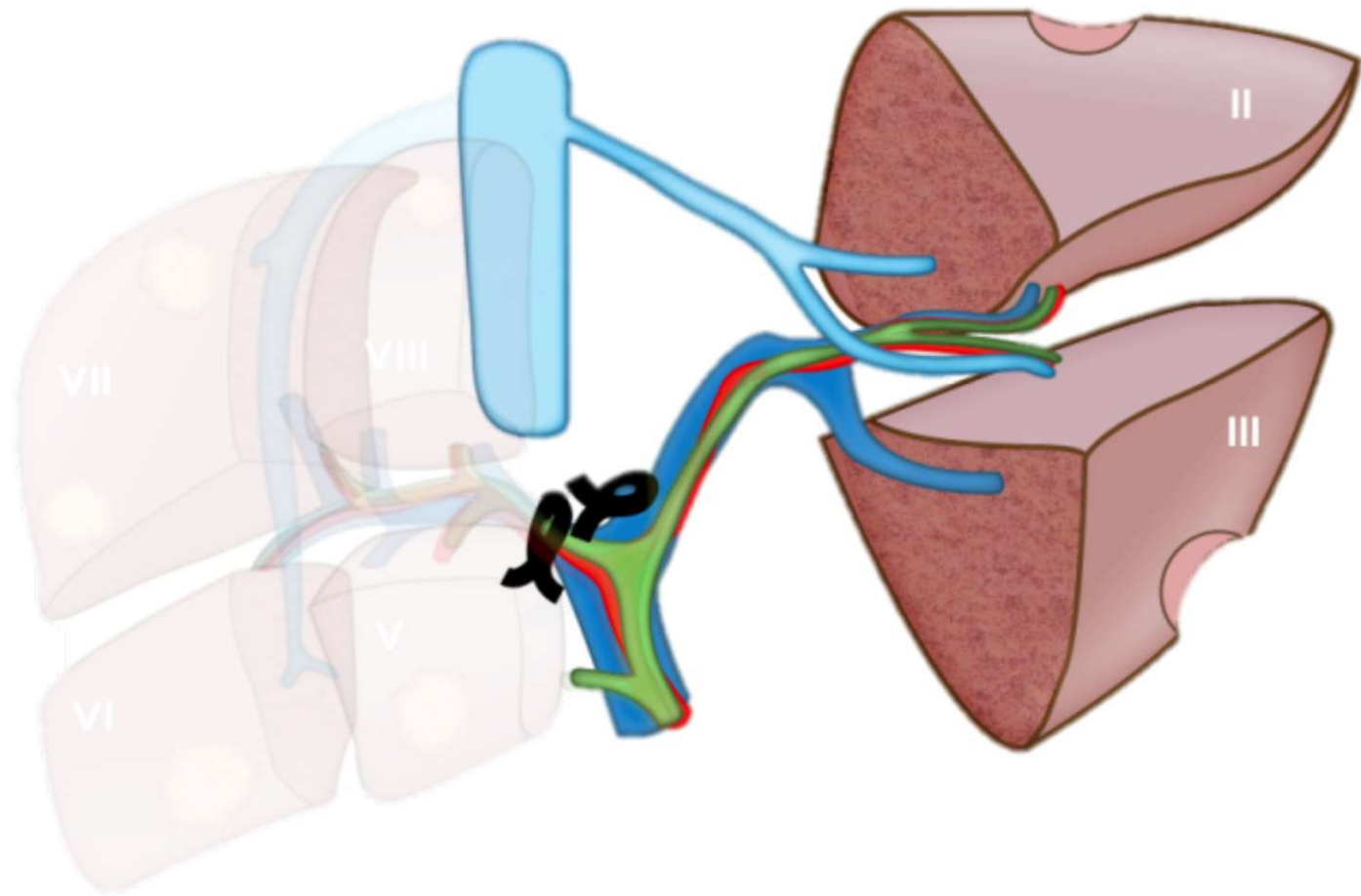
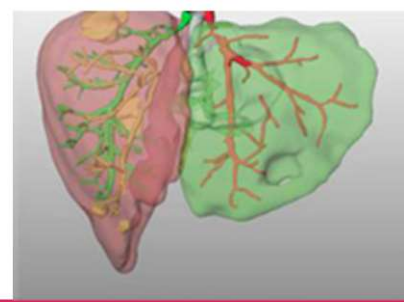


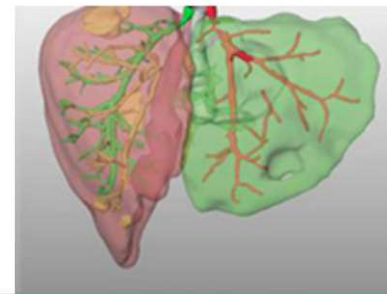
7 days

ALPPS



ALPPS





Right Portal Vein Ligation Combined With In Situ Splitting Induces Rapid Left Lateral Liver Lobe Hypertrophy Enabling 2-Staged Extended Right Hepatic Resection in Small-for-Size Settings

Andreas A. Schnitzbauer, MD, Sven A. Lang, MD,* Holger Goessmann, MD,† Silvio Nadalin, MD,§
Janine Baumgart, MD,|| Stefan A. Farkas, MD,* Stefan Fichtner-Feigl, MD,* Thomas Lorf, MD,¶
Armin Goralcyk, MD,¶ Rüdiger Hörbelt, MD,# Alexander Kroemer, MD,* Martin Loss, MD,* Petra Rümmele, MD,‡
Marcus N. Scherer, MD,* Winfried Padberg, MD,# Alfred Königsrainer, MD,§ Hauke Lang, MD,||
Aiman Obed, MD,¶ and Hans J. Schlitt, MD**

ABCDDV/898

ABCD Arq Bras Cir Dig
2013;26(1):40-43

Original Article

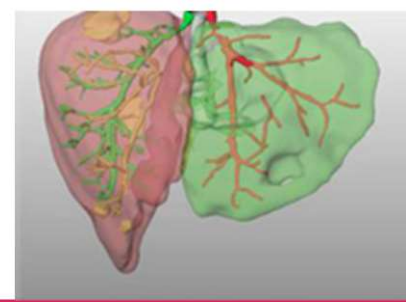
ASSOCIATING LIVER PARTITION AND PORTAL VEIN LIGATION FOR STAGED HEPATECTOMY (ALPPS): THE BRAZILIAN EXPERIENCE

Ligadura da veia porta associada à bipartição do fígado para hepatectomia em dois estágios (ALPPS): experiência Brasileira

Orlando Jorge Martins TORRES¹, Eduardo de Souza Martins **FERNANDES**² Cassio Virgílio Cavalcante **OLIV**
Cristiano Xavier **LIMA**⁴, Fabio Luiz **WAECHTER**⁵, Jose Maria Assunção **MORAES-JUNIOR**¹,
Marcelo Moura **LINHARES**⁶, Rinaldo Danese **PINTO**⁷, Paulo **HERMAN**⁸, Marcel Autran Cesar **MACHAD**

59 e 64% Complicação
12 e 12,8% Mortalidade





EDITORIAL

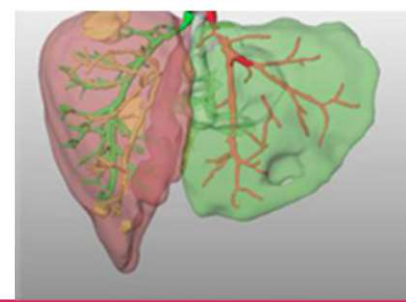
Playing Play-Doh to Prevent Postoperative Liver Failure

The “ALPPS” approach

Eduardo de Santibañes, MD, PhD, and Pierre-Alain Clavien, MD, PhD†*

The safe removal of extensive tumor load in the liver has been one of the main focuses of laboratory and clinical research for hepato-biliary surgeons over the past 3 decades.¹ The first breakthrough is credited to Masatoshi Makuuchi, who in 1980s, introduced the concept of the portal vein embolization (PVE) of the right portal branch to induce hypertrophy of the left side of the liver, enabling a safer removal of large or multiple tumors, mostly located in the right hemiliver and segment IV/2. This technique was rapidly adopted by many to prevent liver failure after a variety of extensive

ALPPS



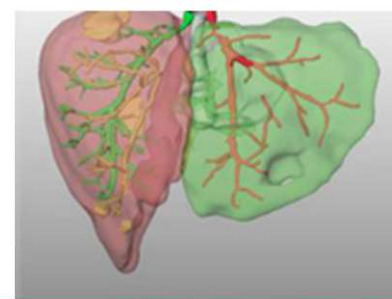
ORIGINAL ARTICLE

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*

53% Morbidade
6,6% Mortalidade



PAPER OF THE 21ST ANNUAL ESA MEETING

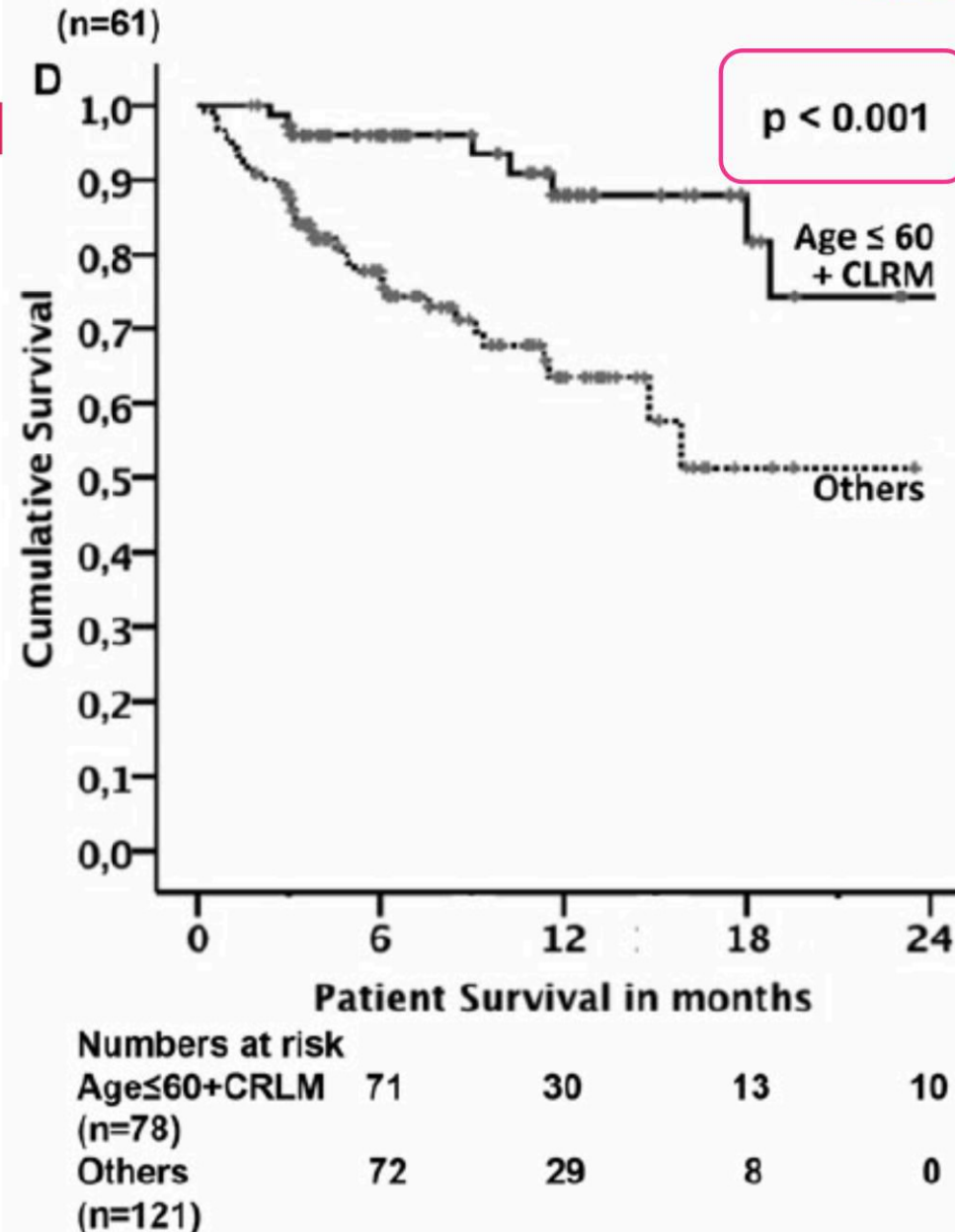
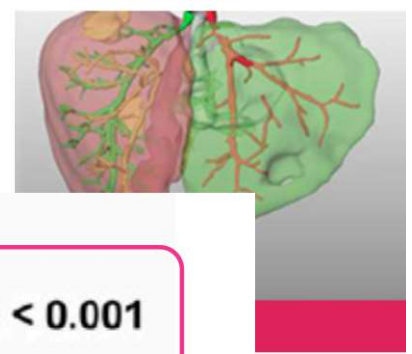
Early Survival and Safety of ALPPS

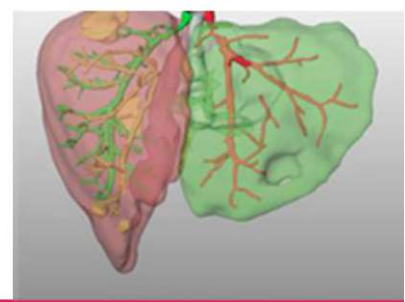
First Report of the International ALPPS Registry

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*

40 % Morbidade
9 % Mortalidade

ALPPS Registry



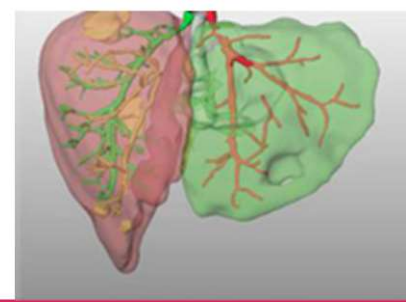


Can we improve the morbidity and mortality associated with the associating liver partition with portal vein ligation for staged hepatectomy (ALPPS) procedure in the management of colorectal liver metastases?

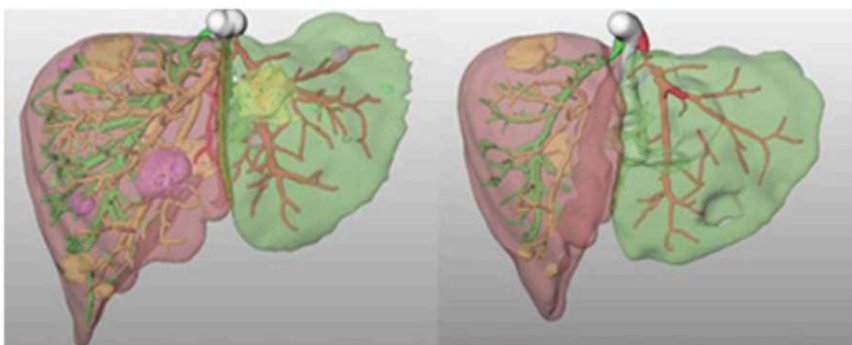
Roberto Hernandez-Alejandro, MD,^a Kimberly A. Bertens, MD, MPH,^a Karen Pineda-Solis, MD,^a and Kristopher P. Croome, MD, MS,^{a,b} *London, Ontario, Canada, and Rochester, MN*

36 % Morbidade
0 % Mortalidade

ALPPS



- ☐ Hipertrofia do RHF superior à E/LVP, maior factibilidade para ressecção R0.
- ☐ Adequada estratificação da doença no 1º procedimento.
- ☐ Permite limpeza agressiva do RHF.
- ☐ Ressecção simultânea na primeira operação em doença sincrônica.
- ☐ O intervalo curto torna pouco provável a progressão tumoral.
- ☐ Na progressão tumoral no hemifígado doente, não há invasão por contiguidade.
- ☐ Alternativa naqueles que não alcançaram hipertrofia suficiente após a E/LVP.



1 st International Consensus Meeting on ALPPS

February 27th and 28th 2015, Hamburg, Germany

[HOME](#)[COMMITTEES](#)[PROGRAMME](#)[VIDEO BROADCASTS](#)[FOTOS](#)[VENUE](#)[POSTERS](#)[SPONSORS](#)[CONTACTS](#)

Karl J. Oldhafer



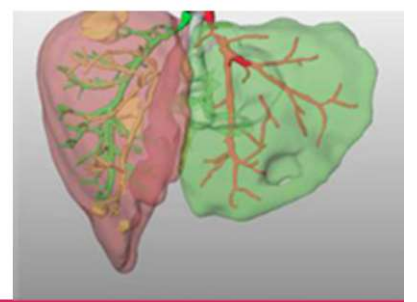
Thomas van Gulik

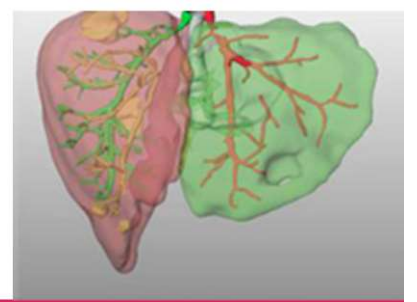


European-African Hepato-Pancreato-Biliary Association

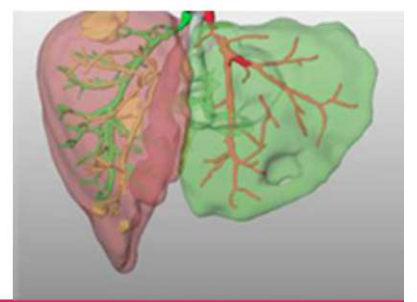
Supported with a grant of DFG

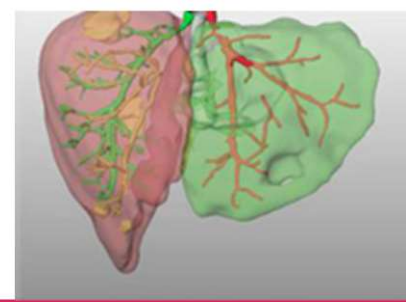
DFG Deutsche
Forschungsgemeinschaft





Brazil





Anatomical aspects of ALPPS

X Rogiers (Ghent, Belgium)

A Schnitzbauer (Frankfurt, Germany)

V Lyadov (Moscow, Russia)



Technical aspects of ALPPS

S Govil (Bangalore, India)

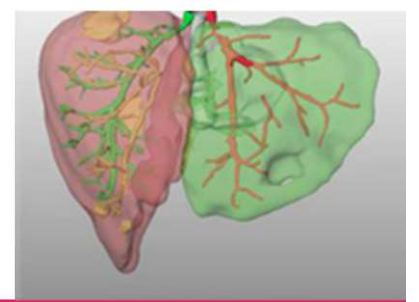
M Enne (Ipanema, Brasil)

P Herman (Sao Paolo, Brasil)

R Hernandez-Alejandro (London, Ontario, Canada)

S Nadalin (Tuebingen, Germany)

O Torres (Sao Luiz, Brasil)



Technical aspects: ALLPS versus ALTPS versus RALPPs versus partial ALPPS, Hybrid ALPPS and Learning Curve

L. Jiao (London, UK)

H Petrowsky (Zuerich, Suisse)

R Robles Campos (Murcia, Spain)

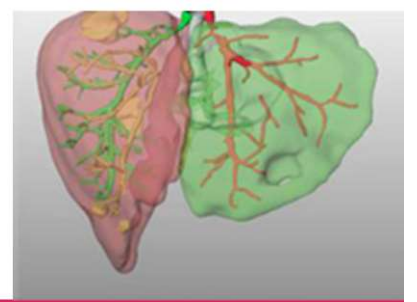


Laparoscopic ALPPS

D Cherqui (Paris, France)

M Machado (Sao Paulo, Brasil)

E Vincente (Sancinarro, Spain)



Liver Hypertrophy: Function versus Volume (including imaging)

Th Van Gulik (Amsterdam, Netherlands)

F-R Pruvot (Lille, France)

SA Lang (Regensburg, Germany) E Sparrelid (Stockholm, Sweden)

GA Stavrou (Hamburg, Germany)

ALPPS and colorectal liver metastases and aspects of chemotherapy

L Aldrighetti (Milano, Italy)

B Björnsson (Linköping, Sweden)

R Hernandez-Alejandro (London, Ontario, Canada)

R Schwarz (Indianapolis, USA)

S Truant (Lille, France)

ALPPS and Klatskin tumours and HCC

W Chapman (St. Louis, USA)

E Fernandes (Rio de Janeiro, Brasil)

A Königsrainer (Tuebingen, Germany)

N Kokudo (Tokio, Japan)

JM Regimebeau (Amiens, France)

A Chan (Hong Kong, China)



Postoperative Outcomes: Morbidity after ALPPS

PA Clavien (Zuerich, Suisse)

V Ardiles (Buenos Aires, Argentina)

H Lang (Mainz, Germany)

M Linecker (Zuerich, Suisse)

M Malago (London, UK)

S Topp (Duesseldorf, Germany)



Postoperative Outcomes: Liver insufficiency and Mortality

E Abdalla (Beirut, Lebanon)

E Jovine (Bologna, Italy)

E de Santibanes (Buenos Aires, Argentina)

E Schadde (Winterthur, Suisse)

Postoperative Outcomes: Long-term survival and disease recurrence

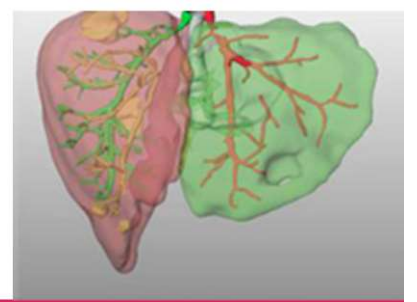
M Donati (Catania, Italy)

O Hahn (Budapest, Hungary)

KJ Oldhafer (Hamburg, Germany)

A Siriwardena (Manchester, UK)

S Breitenstein (Winterthur, Suisse)



ALPPS versus PVE (including salvage procedure)

T Aloia (Houston, USA)

P Bachellier (Strasbourg, France)

M Enne (Ipanema, Brasil)

A. Guglielmi (Verona, Italy)

S Huang (Houston, USA)

WT Knoefel (Duesseldorf, Germany)

Y Sakamoto (Tokio, Japan)

ALPPS versus Two-stage hepatectomy

R Adam (Paris, France)

S. Dokmak (Paris, France)

R Gauzolino (Poitiers, France)

T Pawlik (Baltimore, USA)

J Ramia-Angel (Guadalajara, Spain)

Summary and Conclusion

Know your anatomy before performing ALPPS

Potential No-Go-Variations

- A4 from right anterior HA

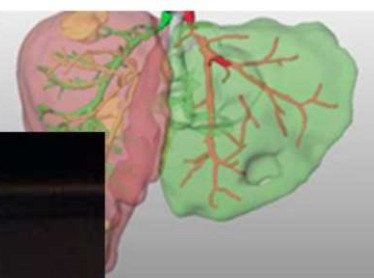
- segment III-vein draining in MHV and requiring resection of MHV

- segment IV-vein draining in MHV and requiring resection of MHV

Avoid long-distance denudation of biliary duct

Risk for biliary leakage increases with orifice No in case of BD#
transhepatic drainages?

Consider rotation, kinking and distortion of hilus
tag structures for easier identification?



Summary and Conclusion

What are the minimal requirements for preALPPS imaging work-up?

Volumetry from highresolution MRI/CT with liver specific CM yes!!!

MRC/ERC dependent from entity

MEVIS dependent from your wallet

Klatskin – possible solutions to overcome no-touch dilemma

hybrid-ALPPS?

PV# = rPVL + left HJ + keep biliary drainage?

ALPPS vs. PseudoALPPS

ALPPS and PseudoALPPS show similar results (safety)

although significantly different FLRs pre#

Question: PseudoALPPS vs. standard hemihepatectomy?

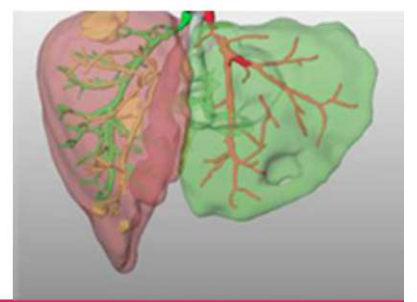
Recommendation

- Continued use of ICG clearance test as preoperative assessment in patients with background liver disease prior to ALPPS to evaluate its role in this setting
- ICG clearance test should preferably be combined with an additional test that can assess regional function of the FLR, such as HBS w SPECT/CT or DHCE-MRI

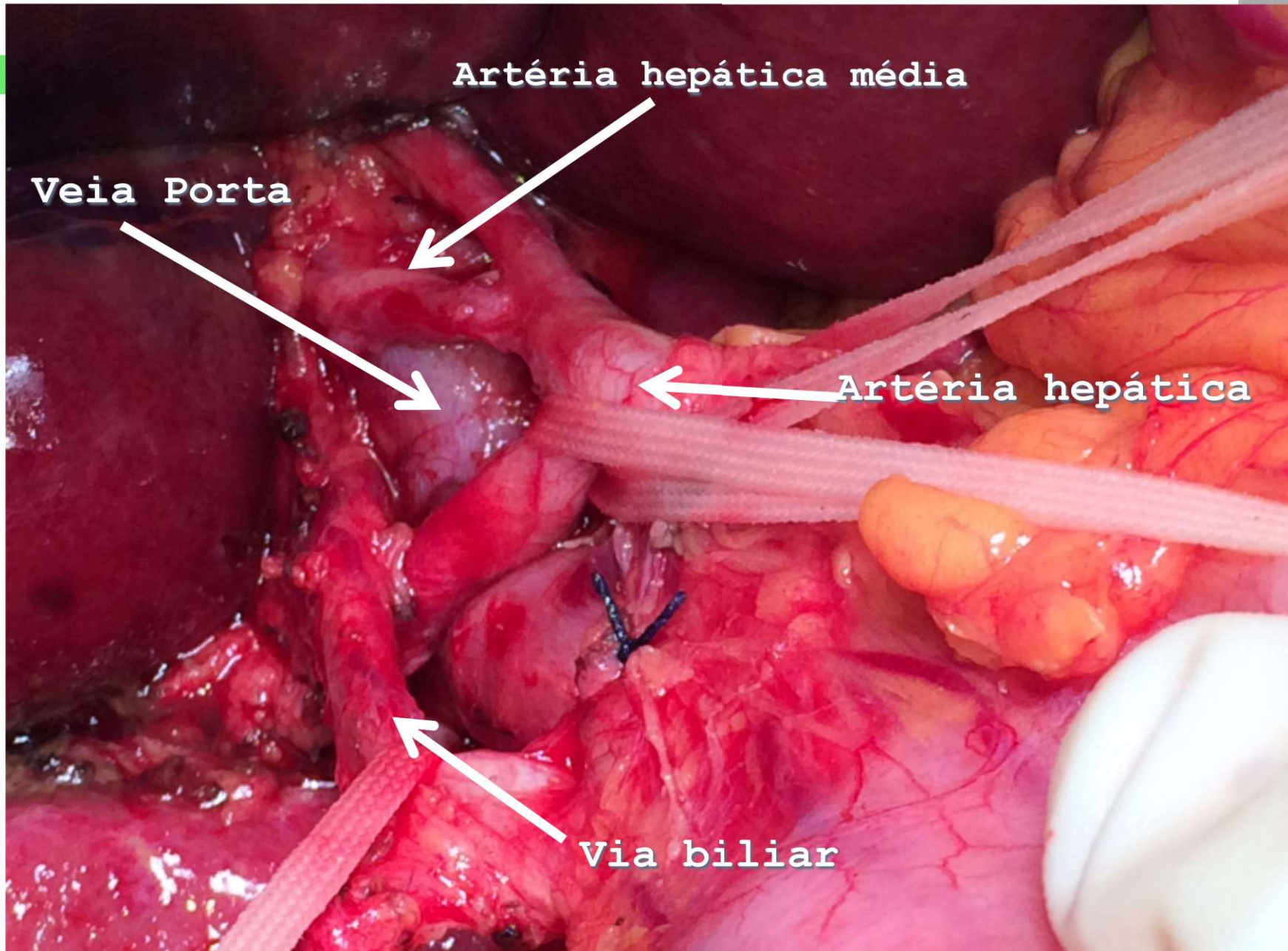
(De Graaf et al. BJS 2011, Nilsson et al. Br J Radiol 2013, Giesel et al. Eur Radiol 2014)

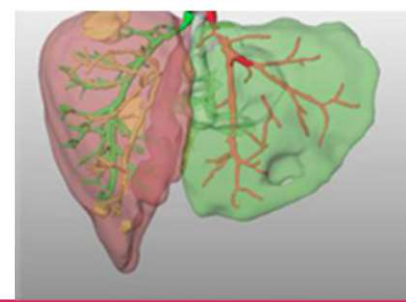


Tópicos



- ❑ Abordagem do ligamento hepatoduodenal
 - ❑ Esqueletização
 - ❑ Linfadenectomia
- ❑ Manuseio do Outflow do fígado deportalizado
- ❑ Manobra de Pringle
- ❑ Transecção do Parenquima (Partição)
- ❑ Manuseio da via biliar
- ❑ Barreiras, USIO e pinças de energia



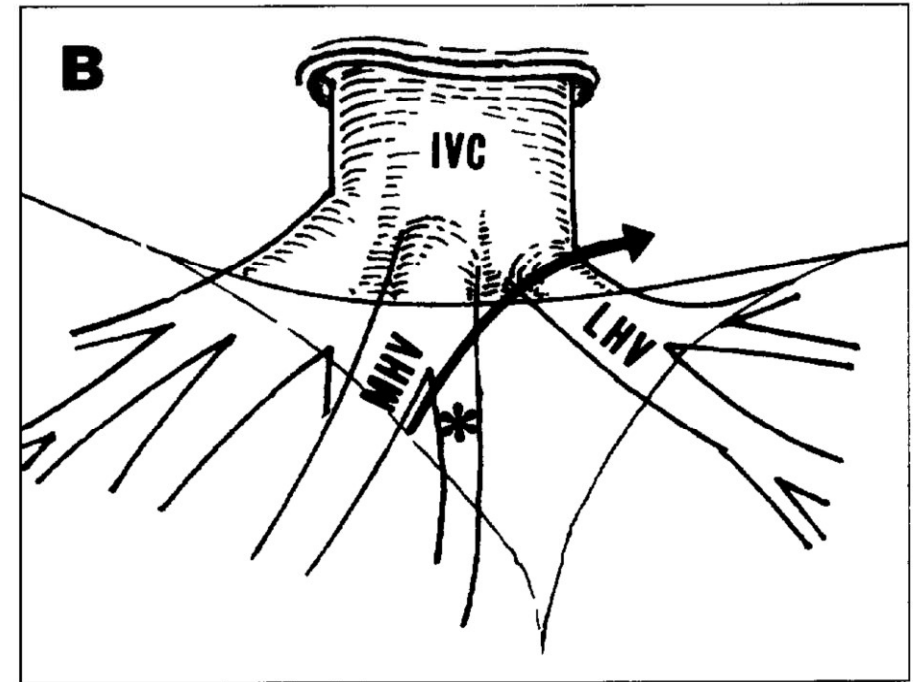
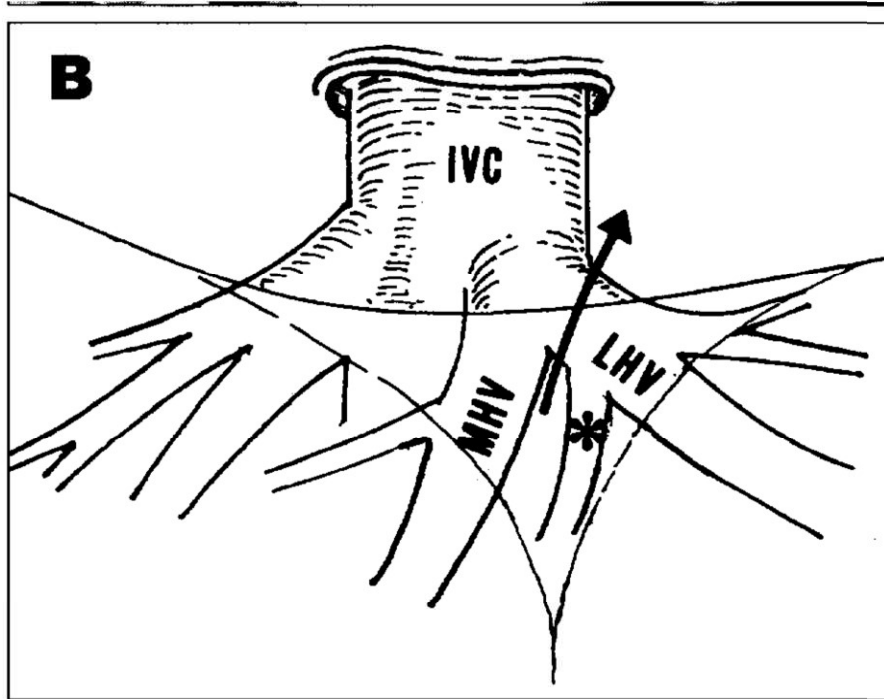
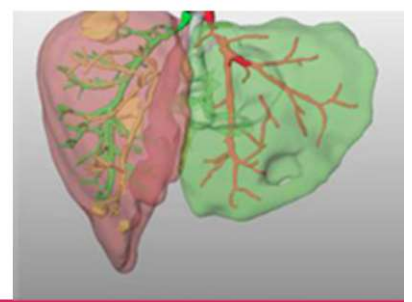


- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1 tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

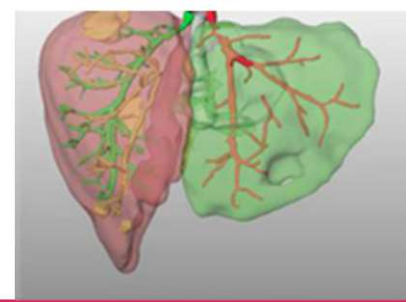
- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

Veia hepática média



- ❑ Sacrificar durante o 1º estágio?
- ❑ Imagem:
 - ❑ TC 3D ou trifásico
 - ❑ USIO

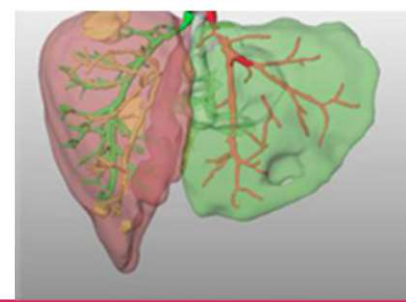
Outflow do fígado deportalizado



- ❑ ALPPS clássico – Ligadura da VHM
- ❑ VHM drena os segmentos 4, 5 e 8 (Congestão)

Hwang et al. Ann Surg 2009;249(4)

- ❑ Fígado deportalizado + congestão:
 - ❑ Isquemia
 - ❑ Fístula biliar
 - ❑ Sepses

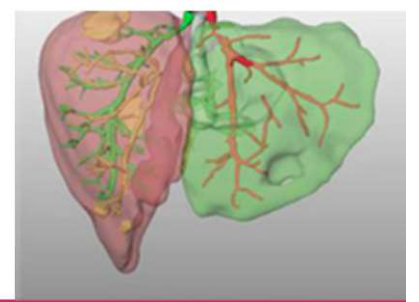


- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1 tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

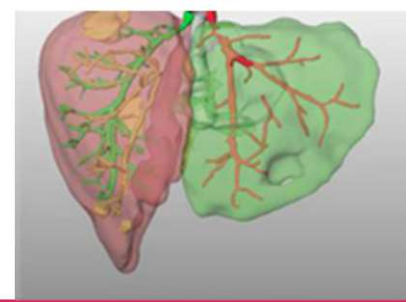
- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

VHM preservada



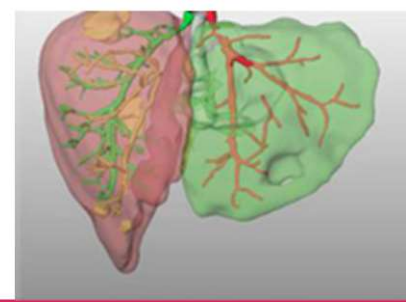
Author	n	Complications	Severe Complications	Mortality	Volume Gain
Petrowsky 2015	6	2	2	0	61%
Alvarez 2015	21	8	NS	NS	89.7%
Hernandez-Alejandro 2015	14	5	2	0	93%
Chan 2014	1	0	0	0	46.1%
Fukami 2014	1	0	0	0	49.8%
Bjornsson 2013	2	0	0	0	106%
Cavaness 2012	1	0	0	0	100%
Total	46	13	4	0	

VHM dividida



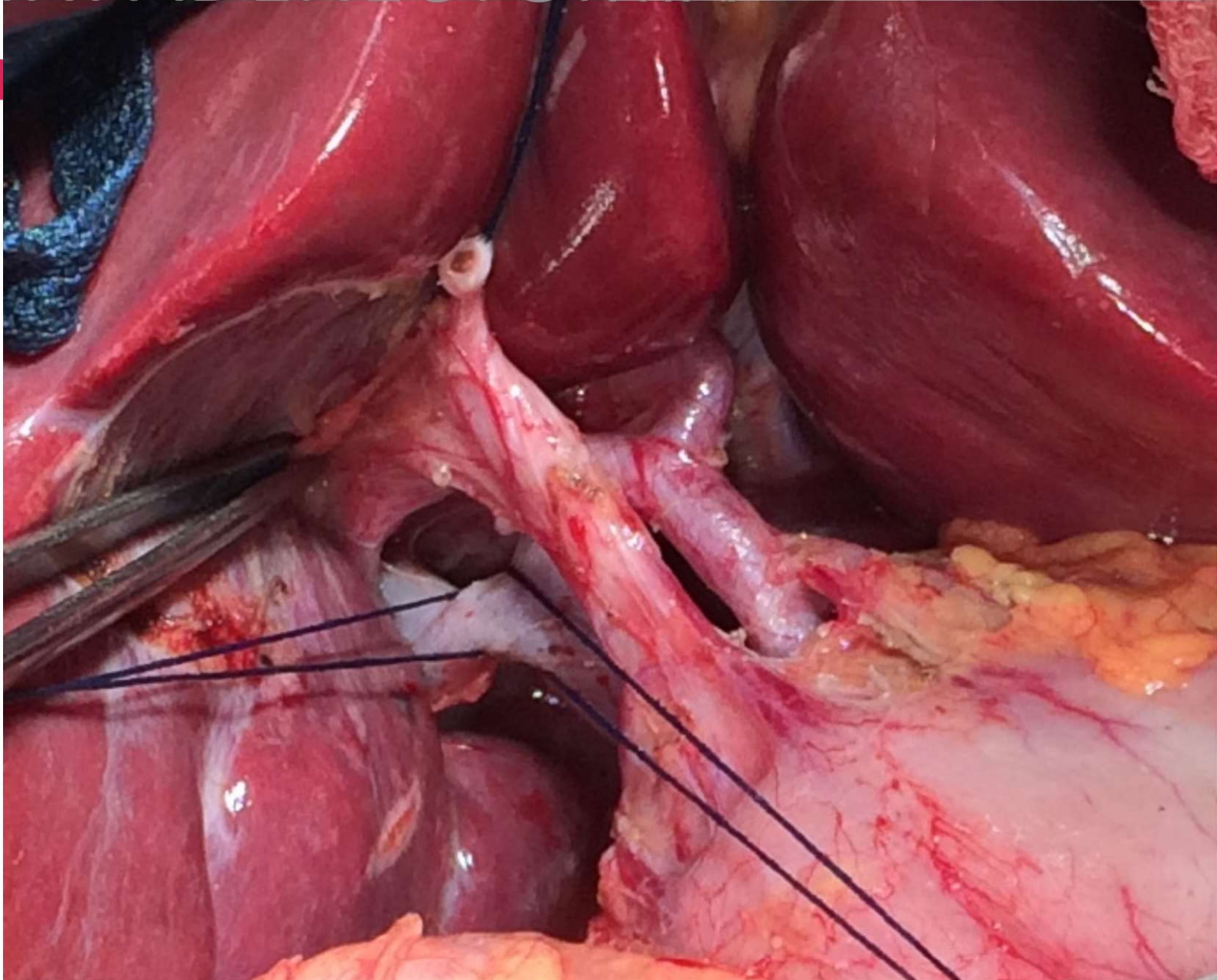
Author	n	Complications	Severe Complications	Mortality	Volume Gain
Petrowsky 2015	18	12	12	4	60%
Alvarez 2015	9	8	NS	NS	89.7%
Jackson 2014	1	0	0	0	NS
Nadalin 2014	15	11	10	4	61%
Chan 2014	1	0	0	0	26%
Robles 2014	22	14	NS	2	70.7%
Machado 2013	1	0	0	0	60%
Torres 2013	39	NS	23	5	83%
Govil 2012	1	1	1	0	60%
Total	107	46	46	15	

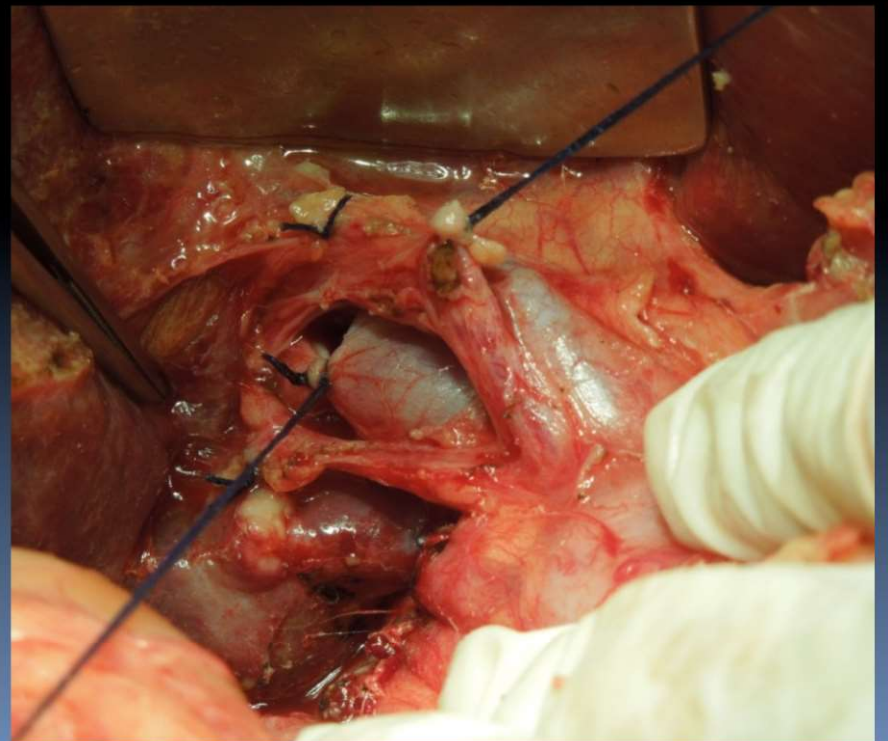
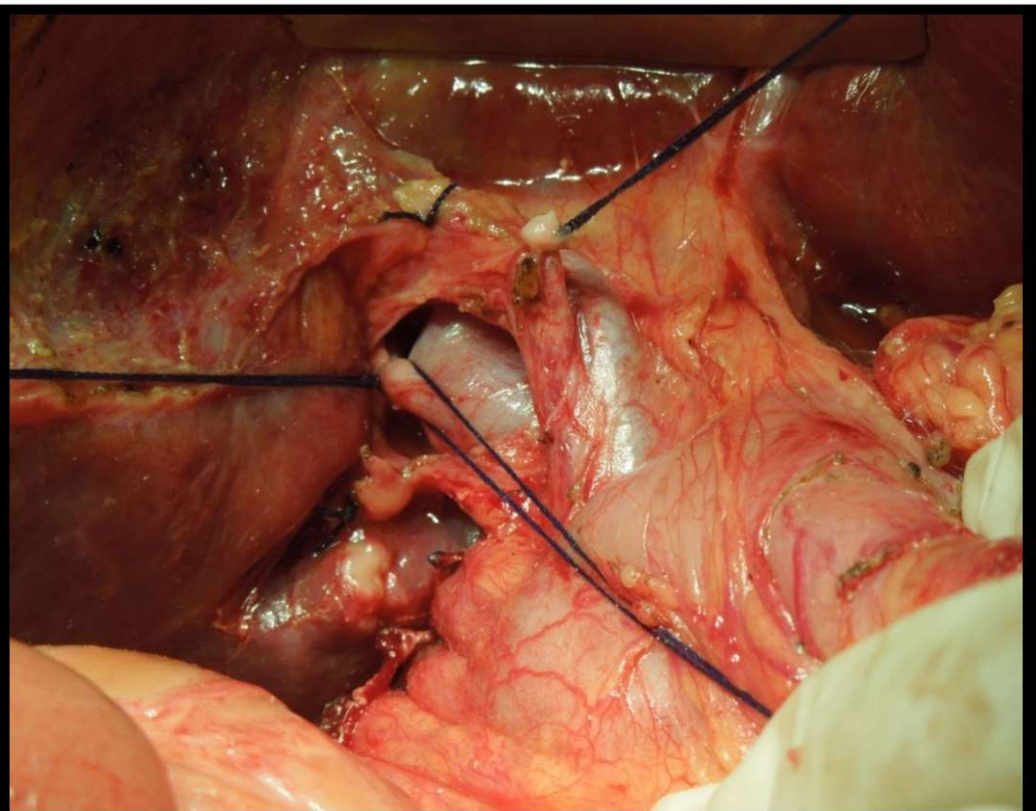
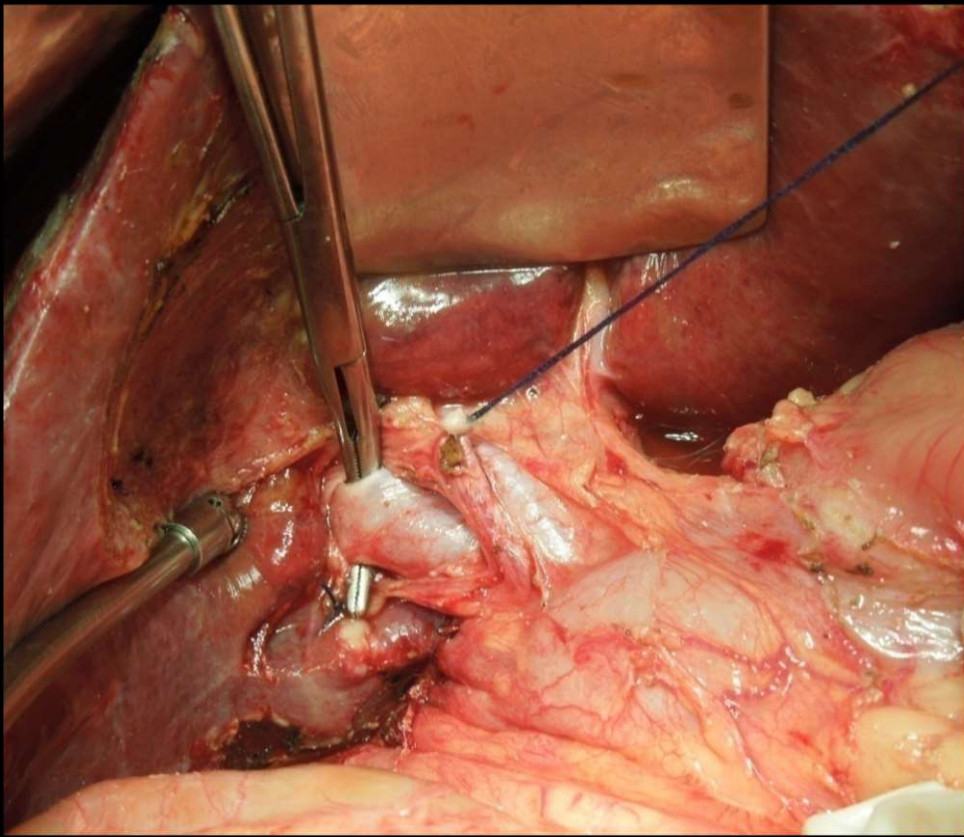
VHM dividida: consequências

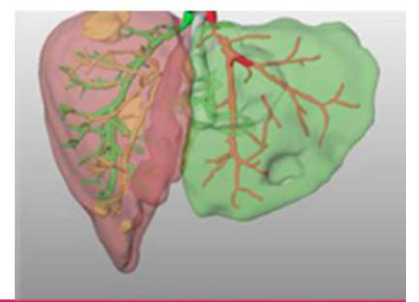


	MHV Preserved	MHV Divided	Total	P value
Complications	13/46 (28.6%)	46/68 (68%)	59	0.000
Severe Complications	4/25 (16%)	46/76 (60.5%)	55	0.000
Mortality	0%	15/98 (15.3%)		0.03

LINFADENECTOMIA





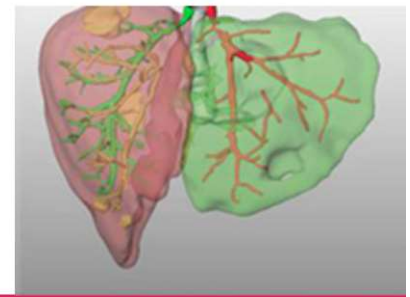


- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1 tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

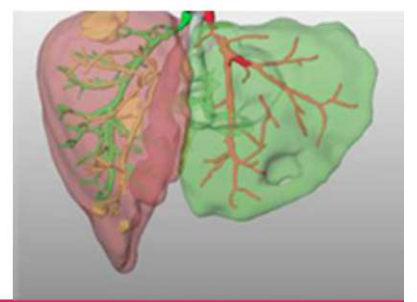
- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

Linfadenectomia “Sim”



Author	Journal	Patients	Complications
Schnitzbauer et al	<i>Ann Surg</i> 2012	25	50 (25 % Severe)
Santibanes et al	<i>Cir Esp</i> 2011	1 (Case Report)	0
Santibanes et al	<i>Updates Surg</i> 2012	10	2 (Biliary Leakage)
Santibanes et al	<i>Ann Surg</i> 2014	30	31% Severe 4 Biliary Leakage 6.6% Mortality
“No more data in literature about routine lymphadenectomy”			

Linfadenectomia “Não”

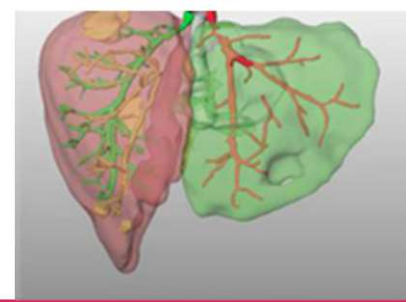


- 15 patients, severe complications 16% and 0 mortality

Hernandez-Alejandro et al Surgery 2015

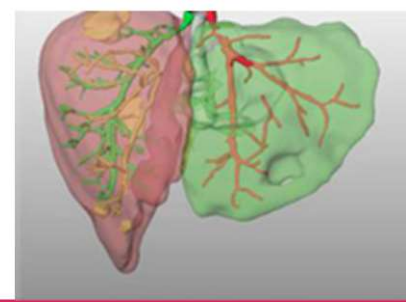
- 24 cases (Feb 2015)
 - ▣ Major morbidity 22%
 - ▣ Severe morbidity 12.5%
 - ▣ 90 day mortality 0%

Linfadenectomia e Morbidade



n=264	Lymphadenectomy n=82	No Lymphadenectomy n=182	p value
Complications	34 (41%)	49 (27%)	0.018
Severe Complications	NA	NA	
Biliary Complications	20%	16%	
Infection/Sepsis	15%	12%	

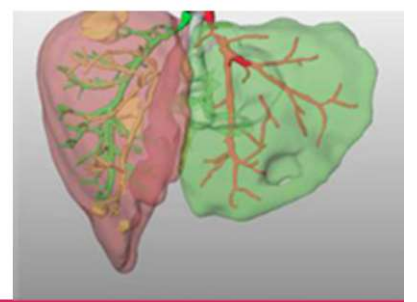
Linfadenectomia e Morbidade



n=254	Lymphadenectomy n=82	No Lymphadenectomy n=172	p Value
Complications	47 (57%)	97 (56%)	0.89

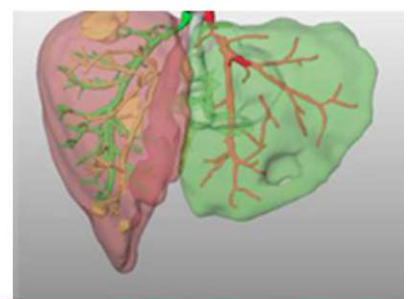
n=144	Lymphadenectomy n=47	No Lymphadenectomy n=97	P Value
Severe Complications	24 (51%)	26 (27%)	0.004

- Biliary complications 20% in both groups
- Infection/sepsis 25% in + lymph vs 8%

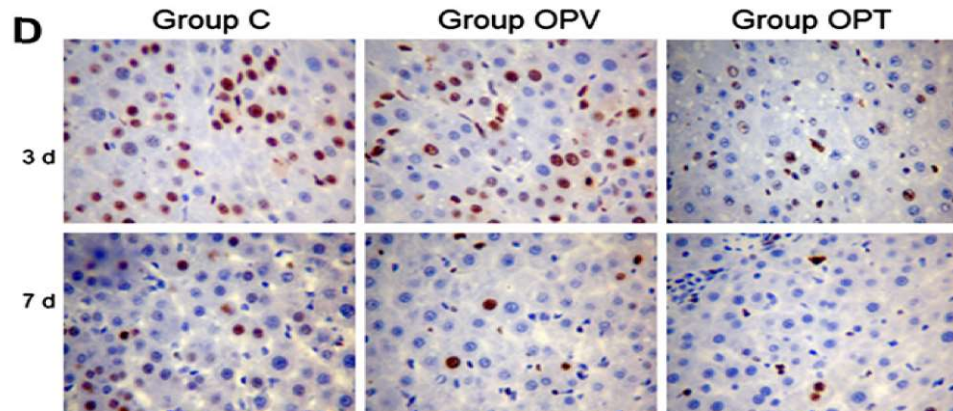
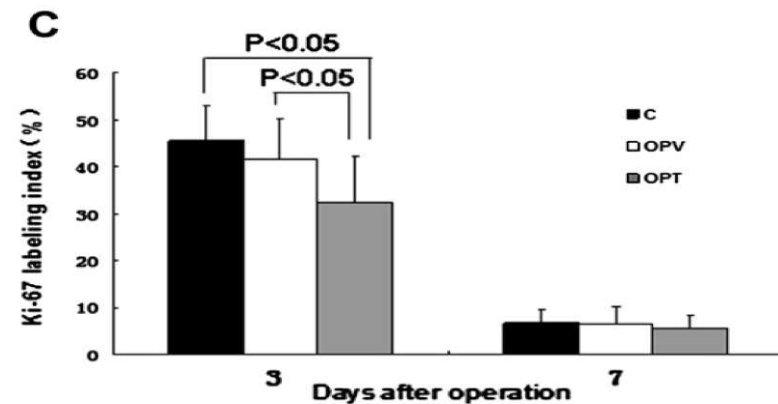
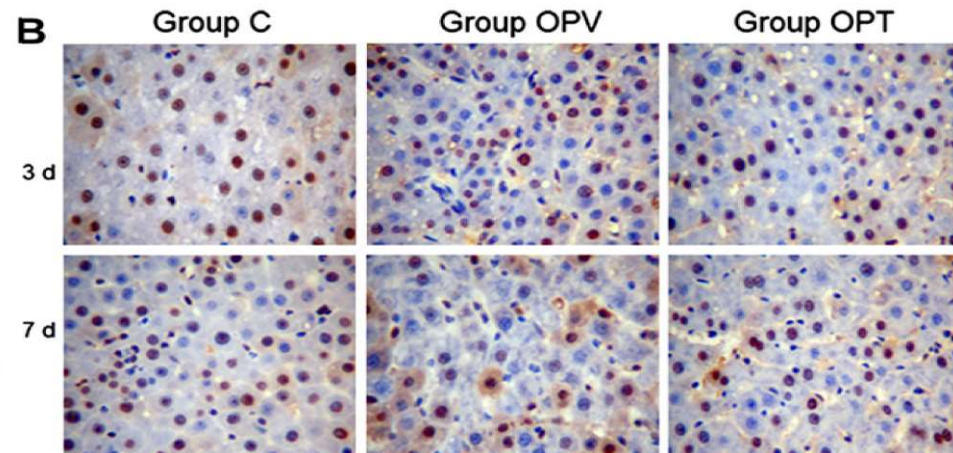
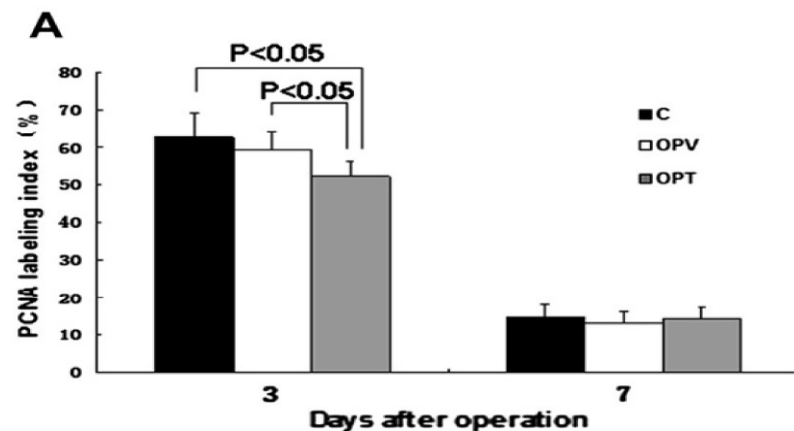


- ❑ A manobra de Pringle afeta a regeneração hepática do remanescente hepático futuro?

Preserving hepatic artery flow during portal triad blood inflow occlusion improves remnant liver regeneration in rats after partial hepatectomy

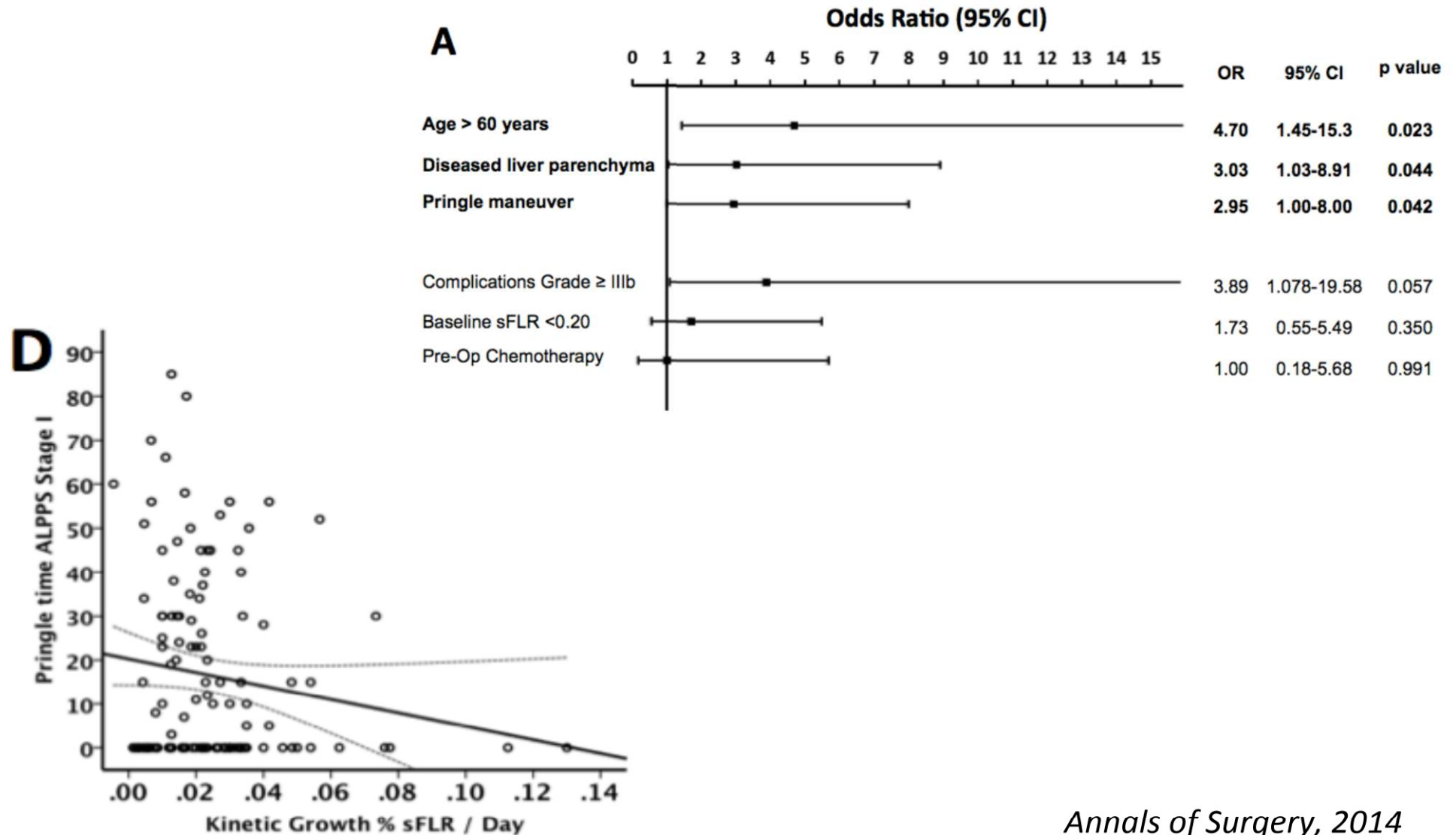
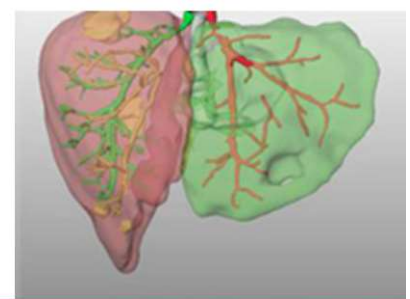


Peng Fei Wang, MD,^{a,1} Chong Hui Li, PhD,^{b,1} Yong Wei Chen, MD, PhD,^a
Ai Qun Zhang, PhD,^b Shou Wang Cai, MD, PhD,^a and Jia Hong Dong, MD, PhD, FACS^{a,*}

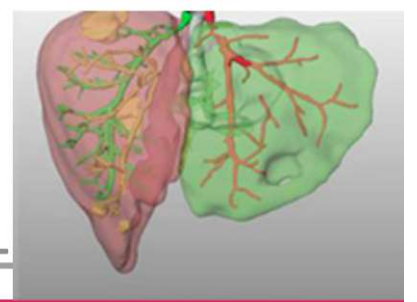


Logistic Regression Analysis for $KG < 0.022/\text{Day}$

Univariate Correlation Between KG and Pringle

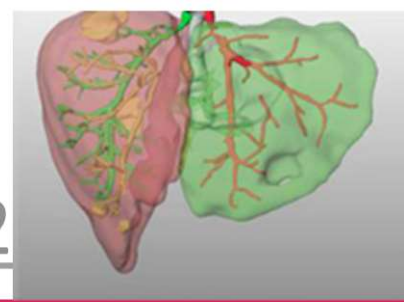


Influence of Pringle Maneuver During Stage 1 ALPPS on Complications after Stage 1



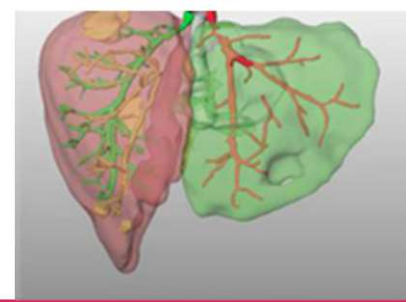
	Pringle n = 121	No Pringle n = 116	Total n = 237	P value
Complications	55 (45%)	25 (21%)	80	0.001
Biliary Complications	12 (22%)	2 (8%)	14	0.2

Influence of Pringle Maneuver During Stage 1 ALPPS on Complications after Stage 2

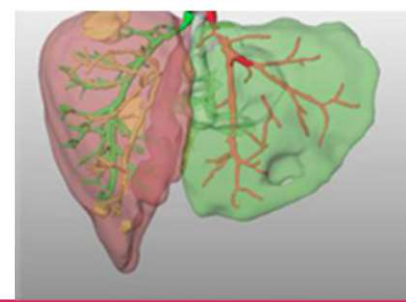


	Pringle n = 117	No Pringle n = 107	Total n = 224	P value
Complications	80 (68%)	52 (48%)	132	0.002
Liver Failure	13 (16%)	3 (6%)	16	0.1

Evidência



- Os melhores resultados podem ser observados com menor manipulação do ligamento hepatoduodenal, preservação da VHM e reduzir a oclusão do pedículo (inflow).



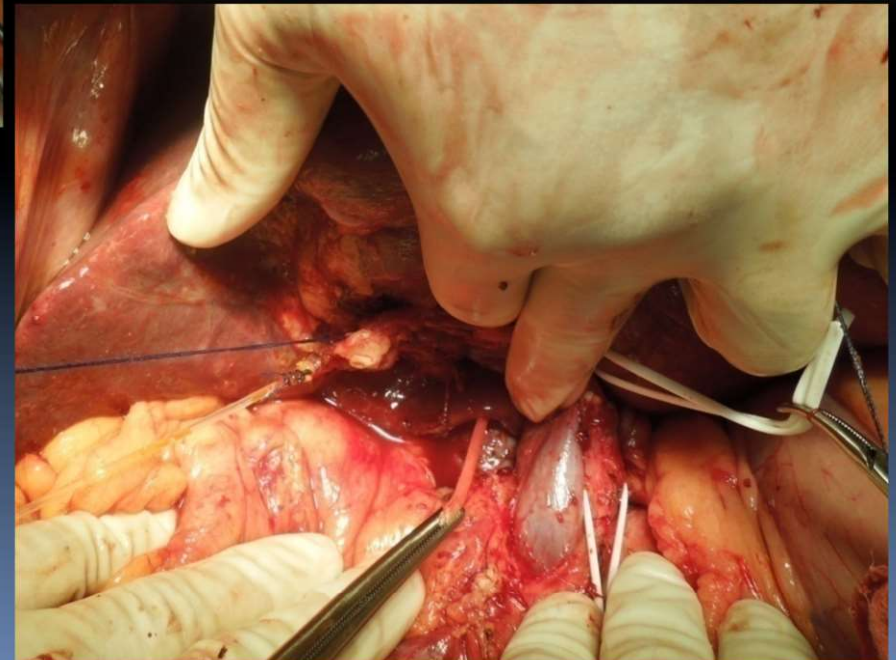
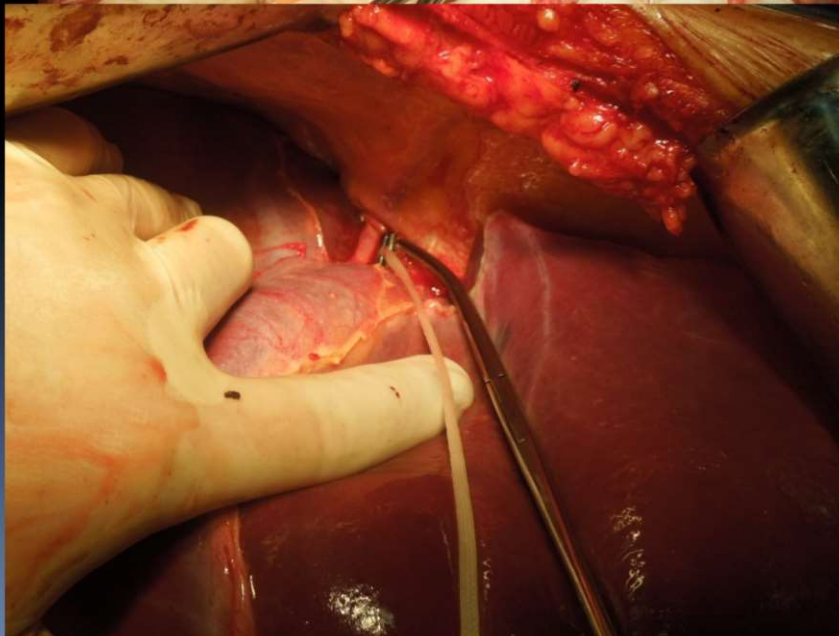
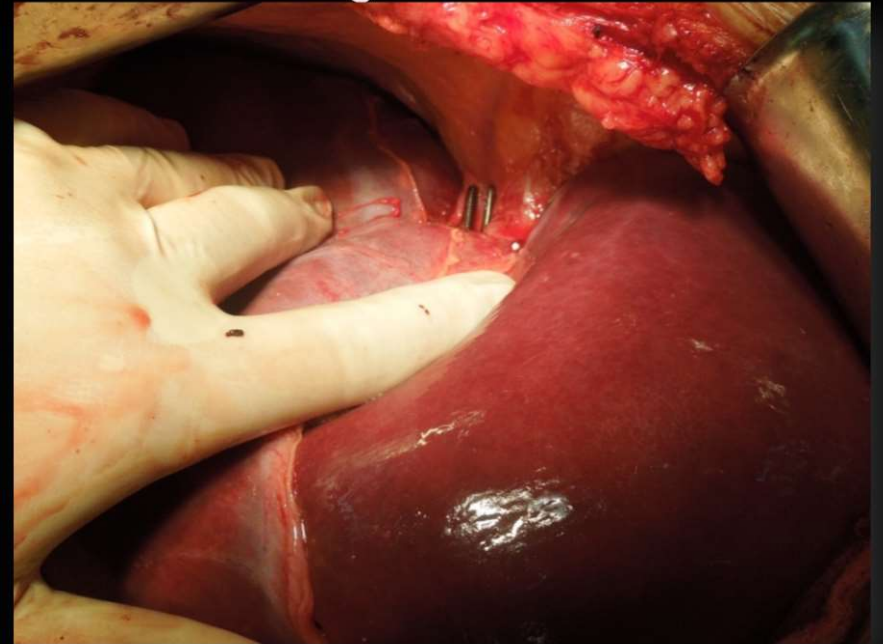
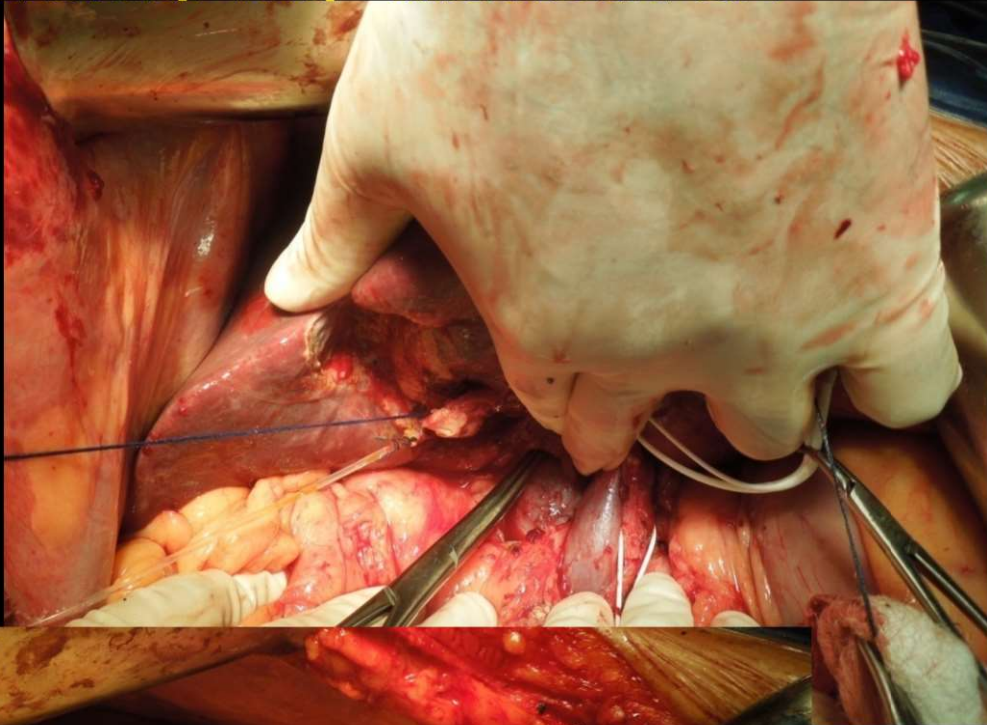
- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1 tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

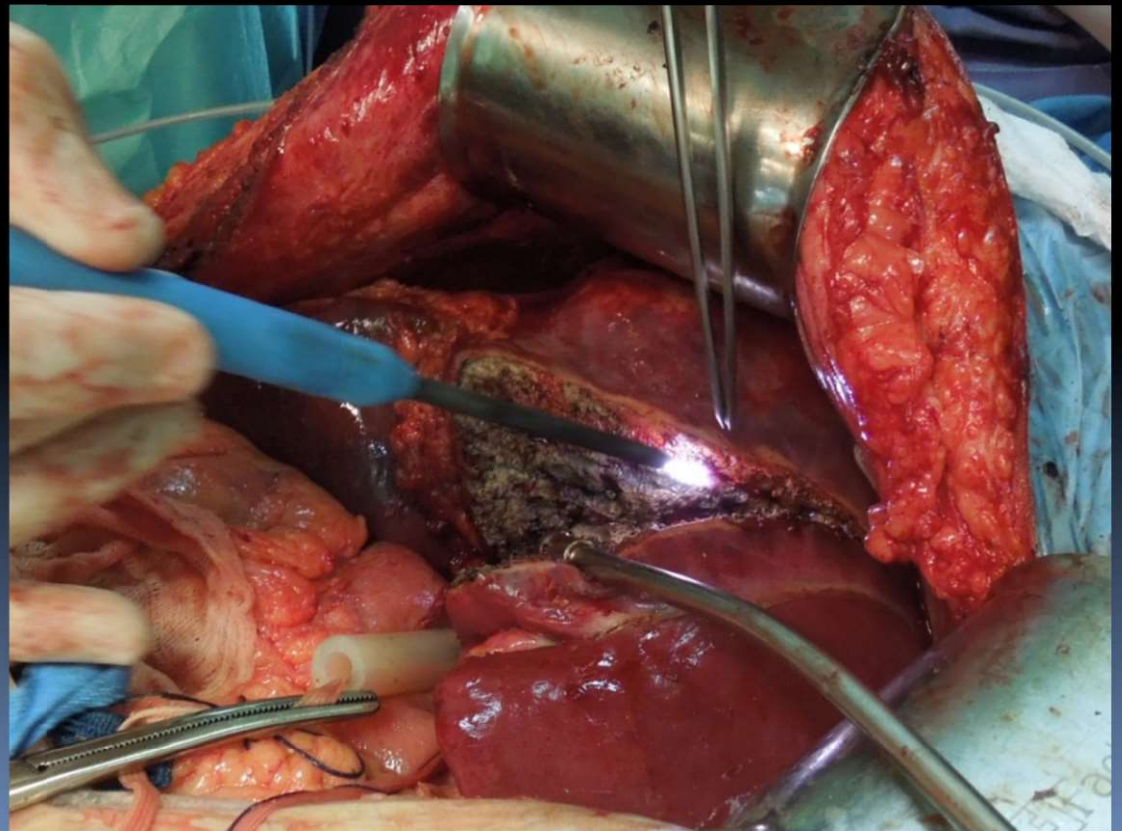
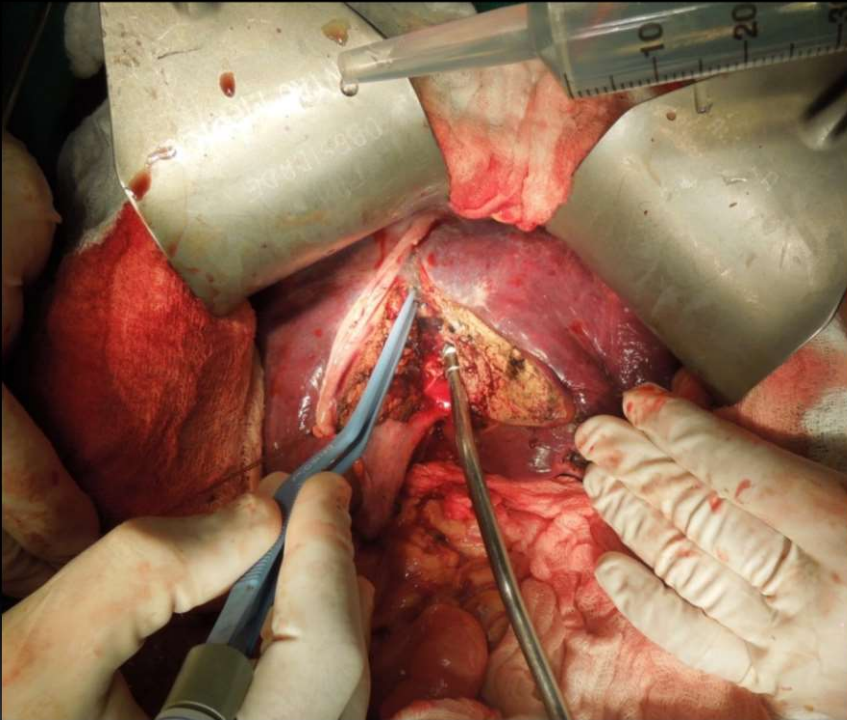
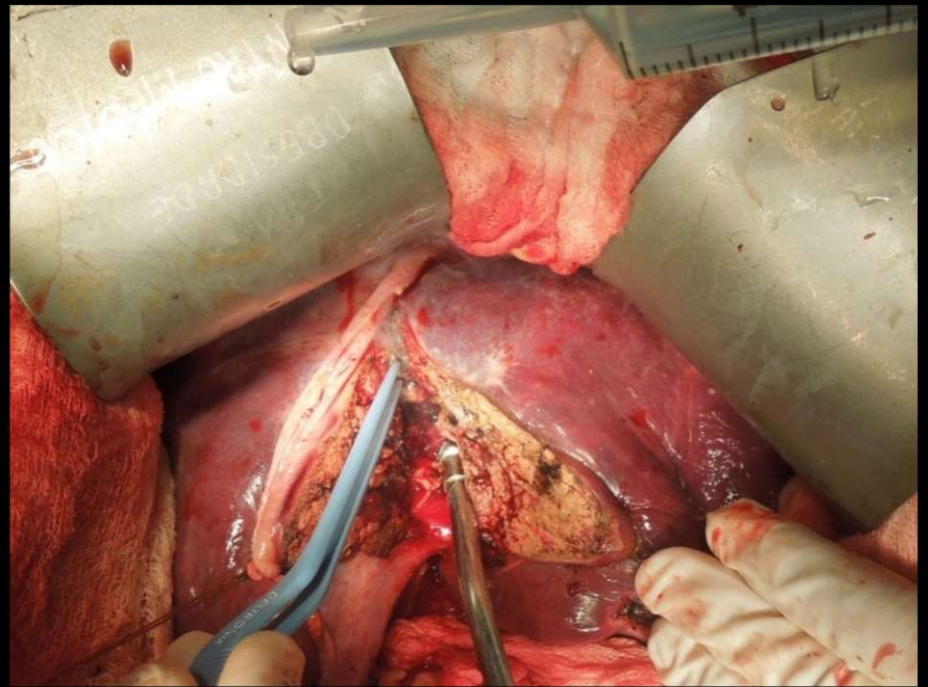
Transecção/Partição

Handing maneuver



Transecção/Partição

Anterior approach





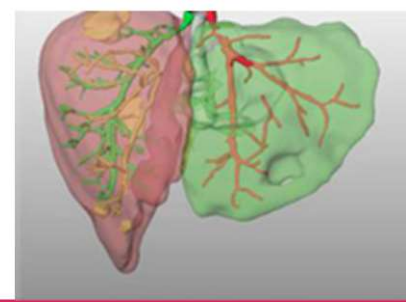
Is Partial-ALPPS Safer Than ALPPS?

A Single-Center Experience

Henrik Petrowsky, MD, FACS, Georg Györi, MD,* Michelle de Oliveira, MD, FACS,* Mickaël Lesurtel, MD, PhD,*
and Pierre-Alain Clavien, MD, PhD, FACS†*

- 50- 80% transecção
- Nível das veias hepáticas
- Utilizar abordagem anterior
- Tumor localizado dentro ou próximo da linha de transecção

p-ALPPS é mais seguro que ALPPS?



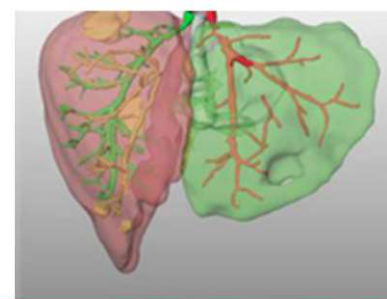
- ❑ 6 p-ALPPS vs 18 ALPPS
- ❑ p-ALPPS: 3 hepatectomia D

	p-ALPPS	ALPPS
Hipertrofia	60 %	61%
Complicações severas	0 %	33 %
Mortalidade	0 %	22 %

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

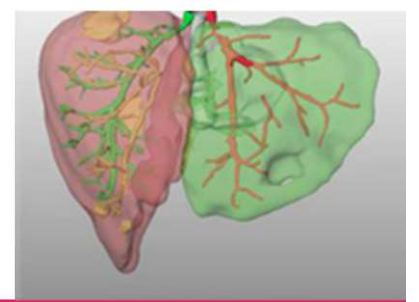
A Prospective Study at a Single Center

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



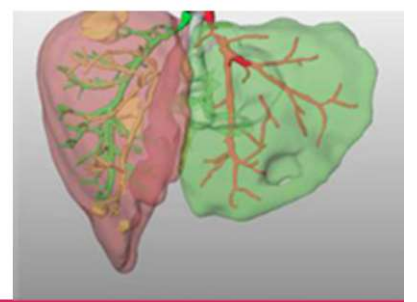
- Estudo prospectivo em um único centro
- 21 p-ALPPS vs 9 ALPPS
- Transecção do p-ALPPS %?

	p-ALPPS	ALPPS	p	Total
Hipertrofia	90 %	107 %	0.45	
Complicações severas	ND	ND		31 %
Mortalidade	ND	ND		6,6 %

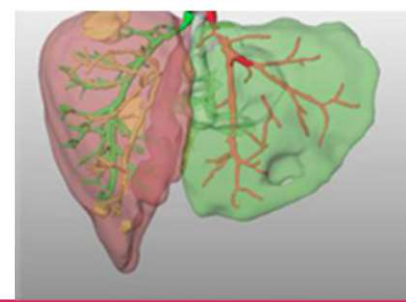


- Análise univariada: transecção total ($p=0,012$) esteve associada com complicações pós-operatórias
- Análise multivariada: transecção total com complicação significativa ($p=0,49$)
- Sem fatores associado a mortalidade em 90 dias.

Conclusões



- ❑ Sem dados claros no registro e na literatura para complicações após o estágio I.
- ❑ Ganha tempo?
- ❑ Complexidade do estágio II?
- ❑ Regeneração similar?
- ❑ p-ALPPS é factível, mas são necessários mais dados.
- ❑ Nível de evidência 4

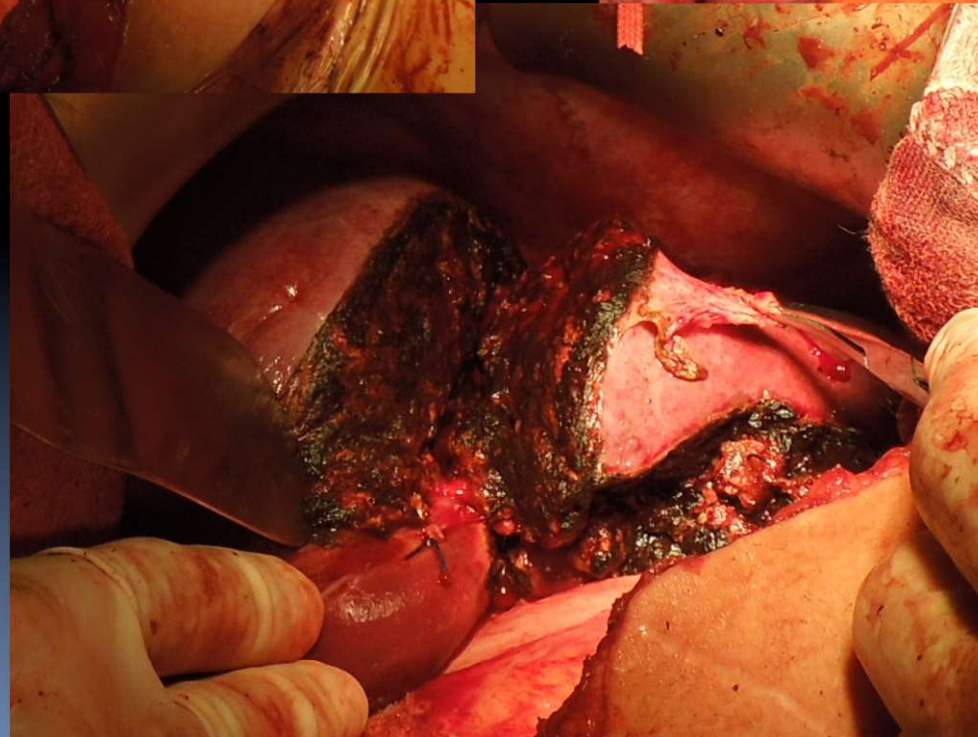
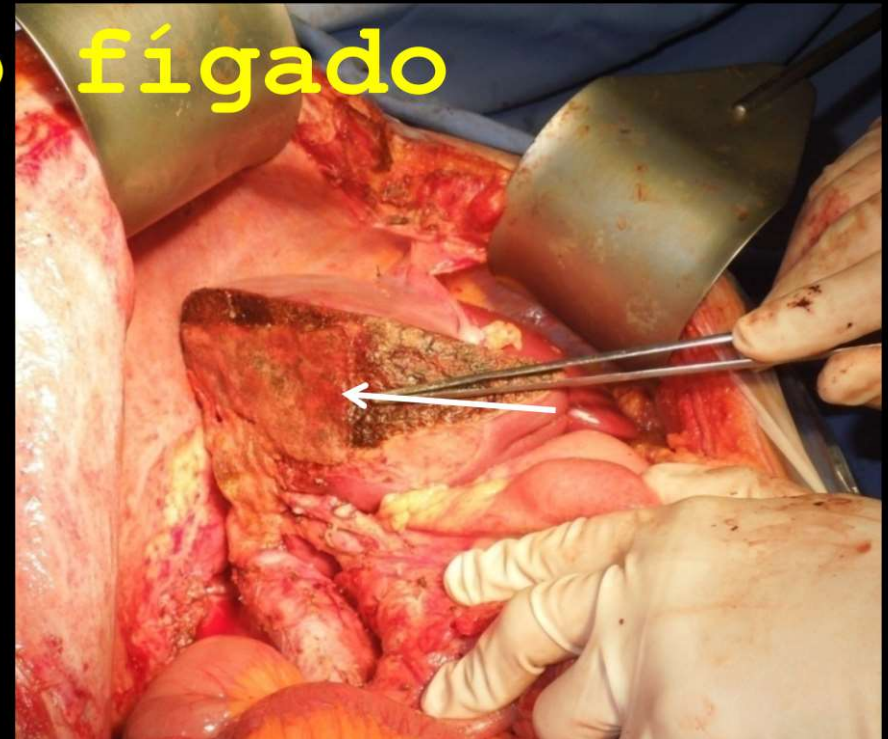
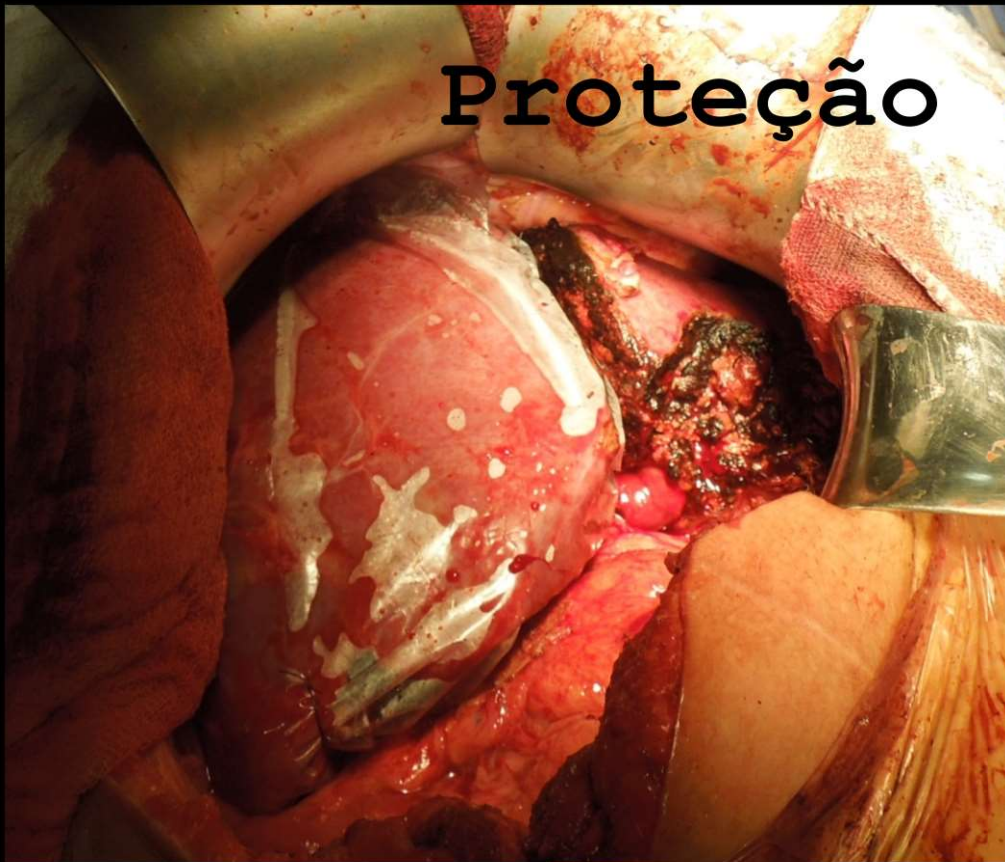


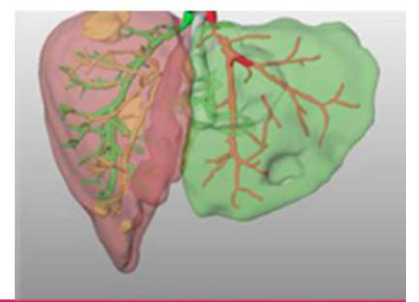
- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1 tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

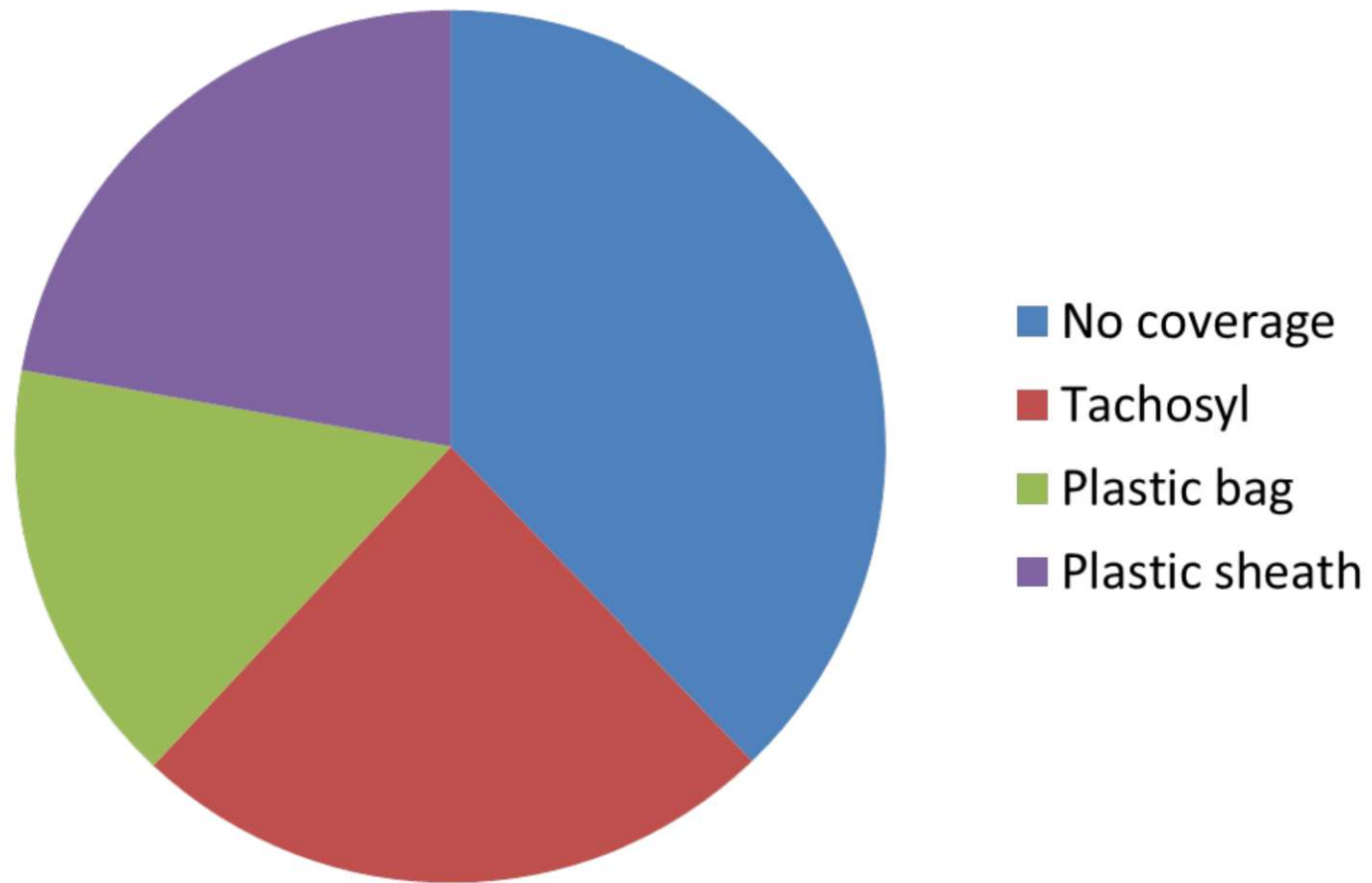
- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

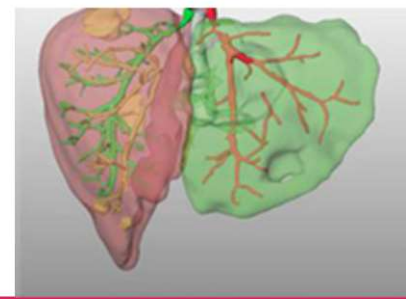
Proteção do fígado



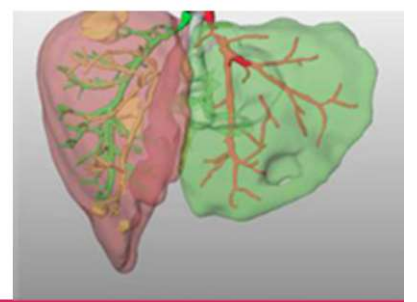


Surface Coverage

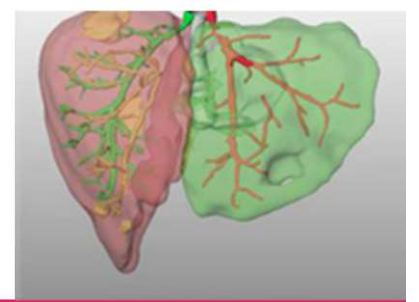




	No Cover	Plastic Bag	Plastic Sheet	Tachosil
Complications Stage 1	6/93 (6.4%)	4/43 (9%)	8/68 (12%)	6/67 (8.9%)
Major Complications Stage 1	3 (50%)	0	3 (37%)	2 (33%)
Complications Stage 2	52 (57%)	20 (45%)	44 (64%)	37 (57%)
Major Complications Stage 2	28 (54%)	8 (40%)	24 (54%)	22 (59%)



- ❑ Não houve diferença entre os grupos
- ❑ Uso de rotina não deve ser recomendado

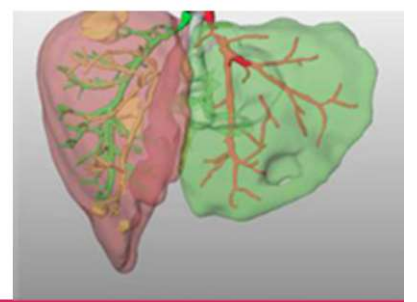


- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1º tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

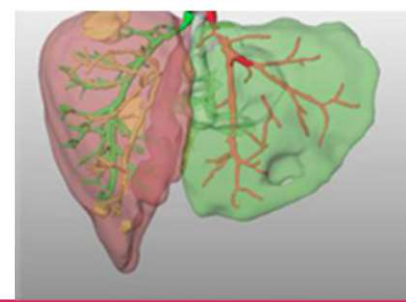
- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

Manuseio da via biliar



Ligadura da via biliar do fígado deportalizado

- ❑ Induz atrofia do fígado não drenado e estimula a hipertrofia contralateral do RHF. *Dokmak , Ann Surg, 2012*
- ❑ Hipertrofia observada no 7º DPO foi similar
- ❑ 87,5% de fistula biliar e/ou biloma na superfície de corte.
- ❑ Conclusões: Não realizar ligadura da via biliar de rotina.

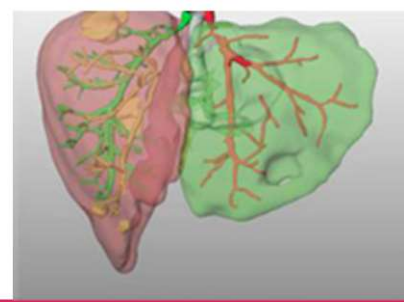


- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1º tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

Complicações biliares/ Fístula

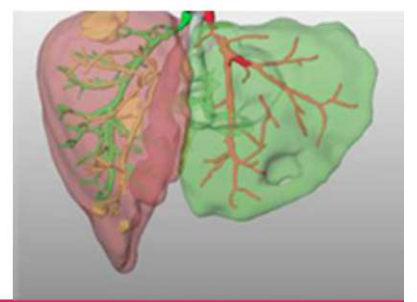


- ALPPS: Impact of the inter-stages course on morbi-mortality and implications for management

Truant, Adam, Pruvot et.al. EJSO 2015 e-pub

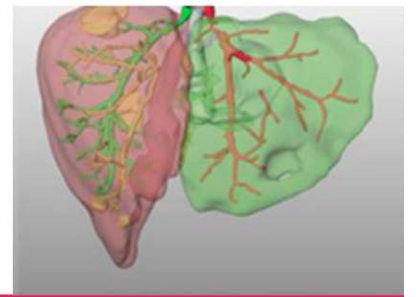
- n=62 patients
- Factors associated with major morbi-mortality
 - ▣ Post stage biliary fistula
 - ▣ Infected and/or bilious peritoneal fluid at stage 2 (*only predictor on multivariate analysis*)

Any Benefit of Cholangiography?

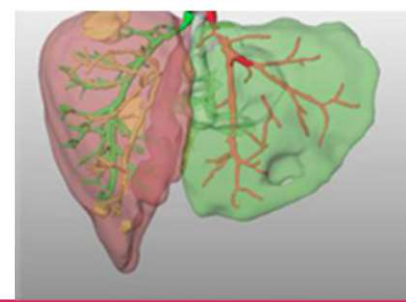


- ALPPS literature and registry not enough data
- LDLT 90% of the cases reported have a cholangiography
 - ▣ LDLT donor surgery is similar to ALPPS
 - ▣ Reported a significant benefit in the donor and recipient

Conclusions



- ❑ Level of evidence 4, 3b (multicenter with multivariate analyses)
- ❑ Bile leakage test is safe and reduce post-operative bile leakage
- ❑ No preference of bile leak test

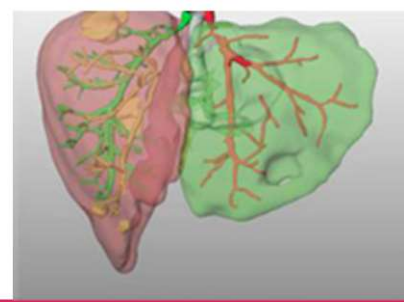


- ❑ Preservar a artéria hepática média (segmento IV)
- ❑ Preservar a veia hepática média
- ❑ Evitar ligar o ducto biliar desportalizado no 1º tempo
- ❑ Fazer teste para fístula biliar
- ❑ Sem evidência para proteção do fígado

Questões não respondidas

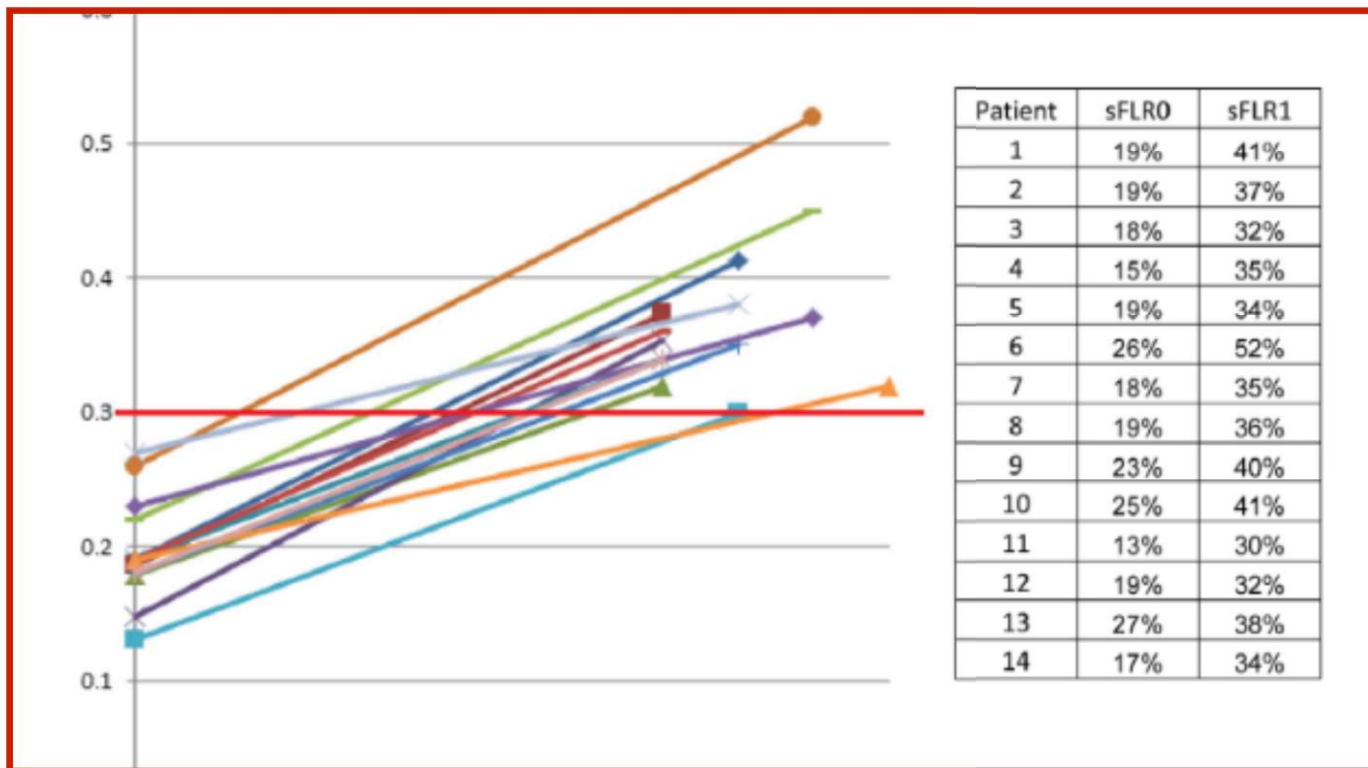
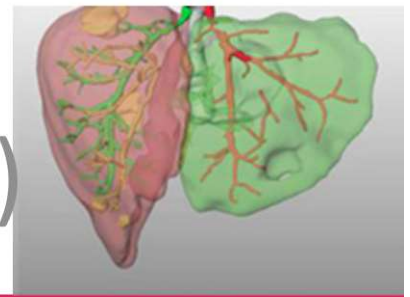
- ❑ Sem recomendação para oclusão vascular
- ❑ Sem recomendação de oclusão do pedículo
- ❑ ALPPS parcial é interessante, mas sem recomendação
- ❑ Papel da linfadenectomia

Intervalo entre estágio 1 e 2

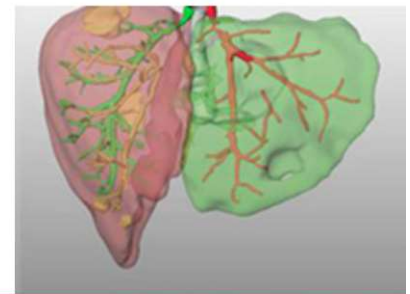


- Registro 2015
 - ❑ Média = 13,7 dias (6-64)
 - ❑ Mediana = 8 dias
- Alvarez et al. Ann Surg 2014
 - ❑ 24/29 (80% eficácia – hipertrofia suficiente-10 dias)
 - ❑ Média de hipertrofia = 89,7%
- Torres et al. Arq Bras Cir Dig. 2013
 - ❑ 39 pacientes (multicêntrico):14,1 dias (6-30)

Timing (Interval between Stage 1 and 2)

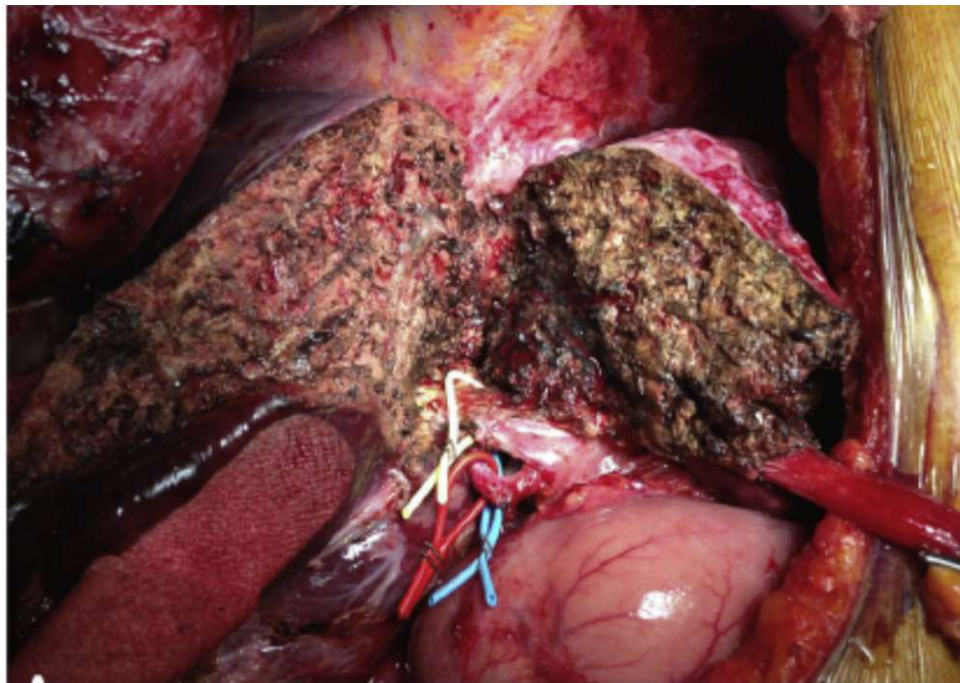


7-9 days
Median increase = $93 \pm 28\%$

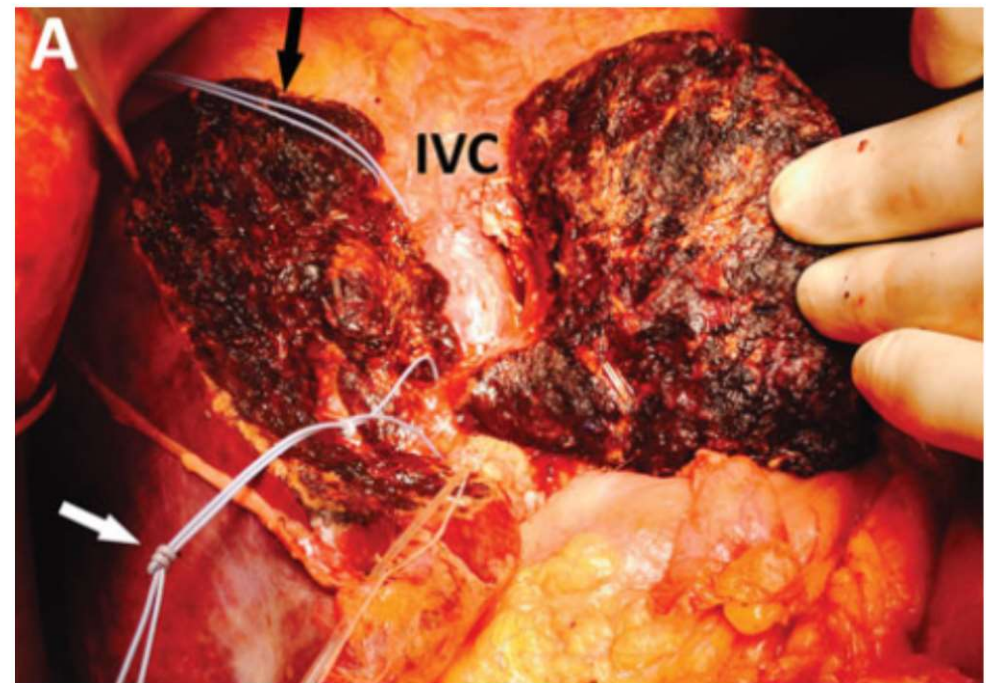


Vessel Identification Tags for Open or Laparoscopic Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy

Raffaele Brustia, MD, Olivier Scatton, MD, PhD, Fabiano Perdigao, MD, Sanaa El-Mouhadi, MD, François Cauchy, MD, Olivier Soubrane, MD



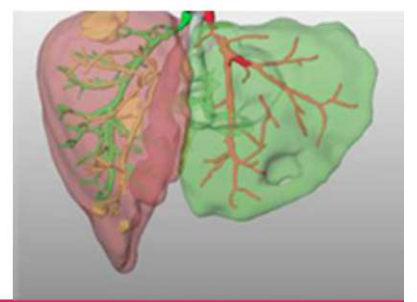
Brustia et al, *J Am Coll Surg* 2013

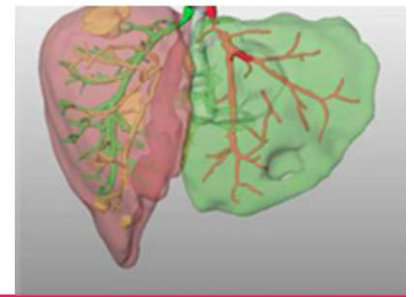


Alvarez et al, *Ann Surg* 2014

Valuable, rapid and no related morbidity

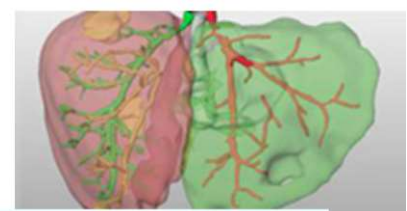
ALPPS laparoscópico

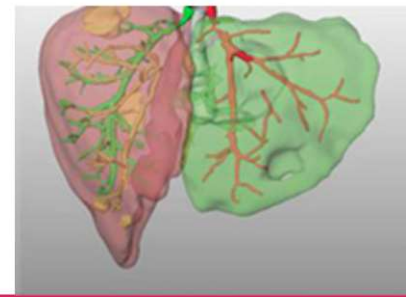




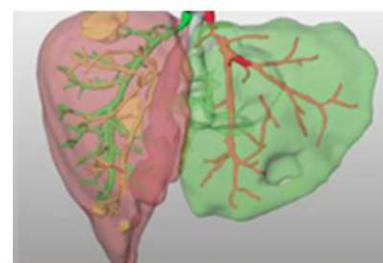
- ❑ ALPPS por videolaparoscopia deve ser realizado em caráter experimental.

Klatskin e CHC



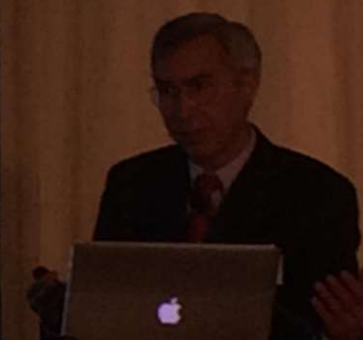


- ❑ ALPPS para MHCCR pode ser considerado uma opção terapêutica.
- ❑ Não há recomendação neste estágio para outro tipo de tumor.



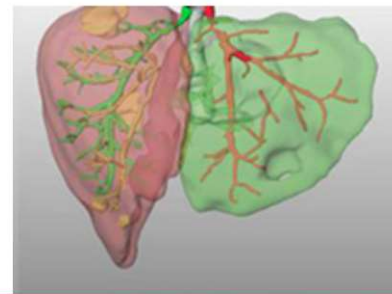
CONCLUSIONS

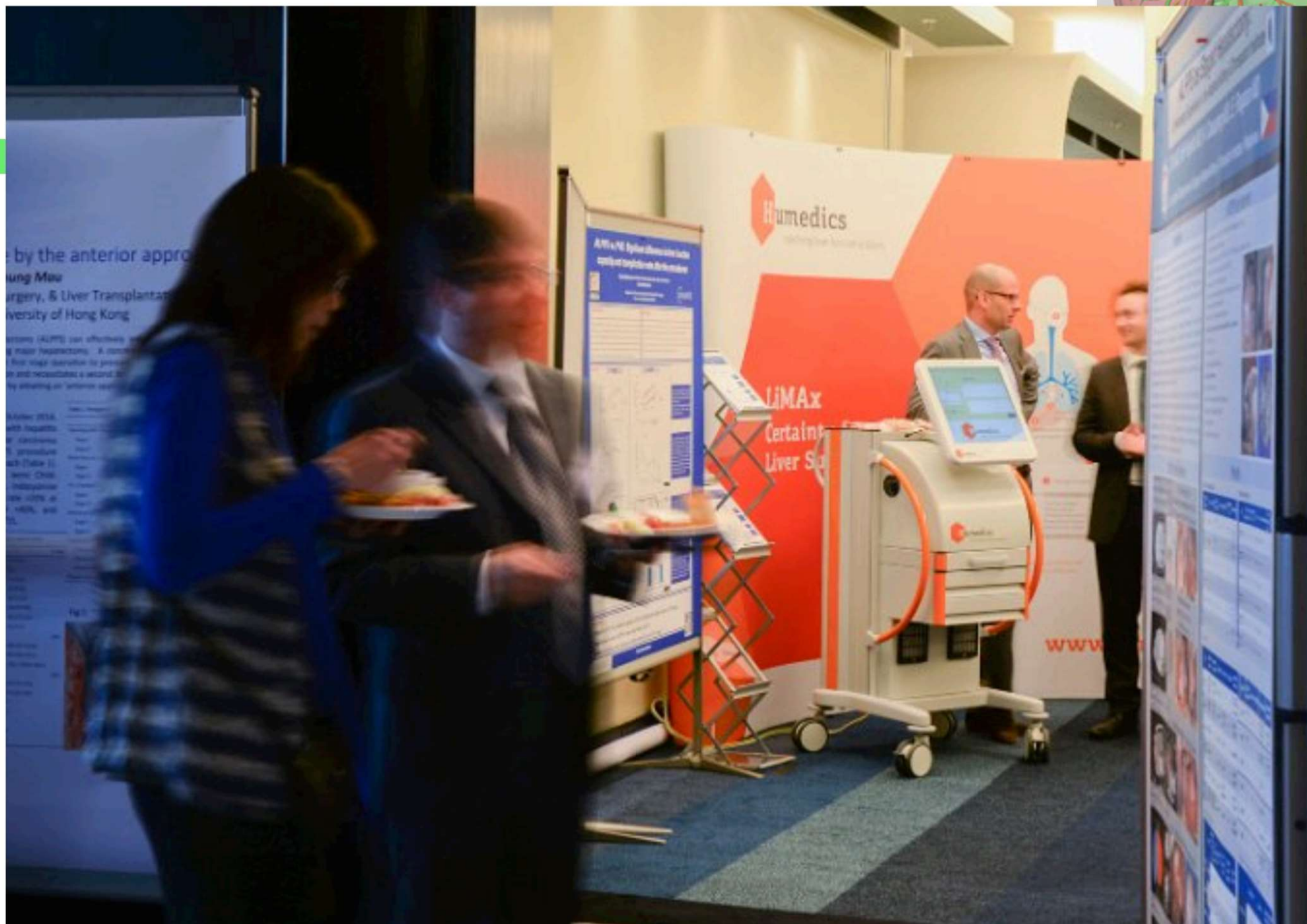
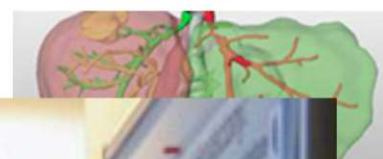
- Correlation of volume and function is difficult in ALPPS. Functional tests after stage I in ALPPS are more useful than volumetric studies
- Hepatobiliary scintigrafie (HBS) provides simultaneous regional and functional information
- Hepatobiliary scintigrafie using ^{99m}Tc -mebrofenin can be performed in any Nuclear Medicine department
- Value of HBS awaits further clinical assessment in ALPPS. Standardization of analysis required.

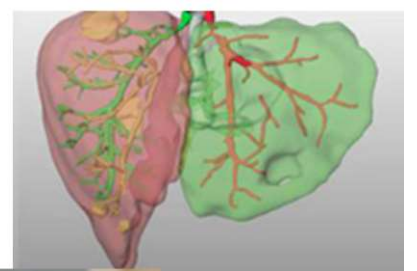


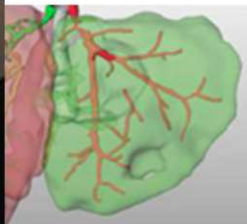
V - CONCLUSIONS

3. pALPPS no differences in complications (Stage I, Stage II and combined)
 - Preliminary data in 23 patients
4. Age >60 (MI) confirmed a difficult condition
 - cardiac history and monitoring to be compounded in the extensive ALPPS work-up
5. Blood transfusion and long OP time (pringle): indicators of surgical difficulty or pathologic parenchyma
 - ? Only true indication for partial ALPPS?
6. Learning curve
 - No center volume effect at case load 20 (yet)
 - Time, collective experience, refinement of indications and technique



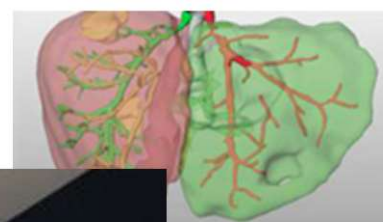






Recommendation of the workgroup: Conditions to proceed to stage 2

1. Adequate clinical condition (COMMON SENSE)
2. Absence of active complication (COMMON SENSE)
3. Normal Doppler US (FLR flow) (COMMON SENSE)
4. Normal or near normal liver function tests (MELD <10) (HIGH)
5. Adequate FLR vol ($\geq 30\%$ normal liver - $\geq 40\%$ diseased)
(SO FAR... THE PARADIGM)
6. HIDA-scan FLR $\geq 30\%$ (LOW)



Changing the paradigm in ALPPS

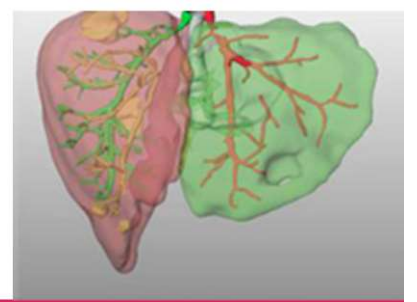
The future paradigm!!

1st Step

Patient in good condition,
normal LF test, enough
function increase

2nd Step

- Less aggressive as possible surgical procedure
- Partial parenchymal transection
- FLR clean-up
- Simultaneous procedure only in CR
- Goal: FLR function increase



2º Estágio

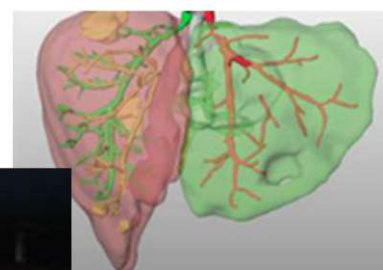


1º Estágio



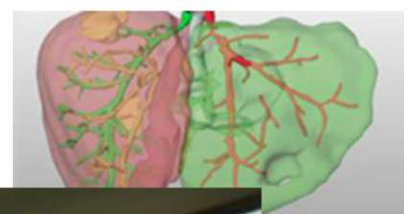
2º Estágio



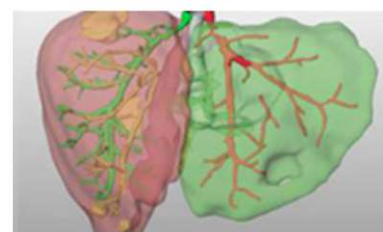


Recommendations

- ALLPS for CRLM can be considered as a therapeutic option
- No recommendations possible at this stage for other tumor types
- **Please enter complete data in the registry!**
 - to achieve reliable outcome data
 - to identify predictors for survival
 - to optimize indications







Conclusions (& Implications for Clinical Trial Development)

- Few centers perform PVE and ALPPS
- PVE is significantly safer than ALPPS
 - MDACC PVE/2 stage mortality:
 - (2011) 6% → (2011-2015) <1%
 - Strasbourg: 0%, Verona 0%
- Success of PVE is strongly correlated with IR technical ability and device
 - MDACC PVE: 97% successful hypertrophy
 - Strasbourg: 96% successful hypertrophy
 - Verona: 93% successful hypertrophy

PVE Evolution

Year	Author	Concept
1897	Cantle	Contralateral hypertrophy after PV ligation
1920	Rous, J Exp Med	Contralateral hypertrophy after PV ligation
2000	Vauthey, Liv Txp	Liver volumetry standardized to BSA
2004	Vauthey, Ann Surg	Minimum FLR cutoffs
2005	Madoff, JVIR	Right + IV PVE with embolic microspheres
2007	Ribero, BJS	5%-age point rule
2013	Shindoh/Vauthey, JACS	KGR > 2%-age points per week rule
2013	Shindoh/Aloia, JACS	Right + IV PVE degree of hypertrophy = ALPPS

15%

5%

0%

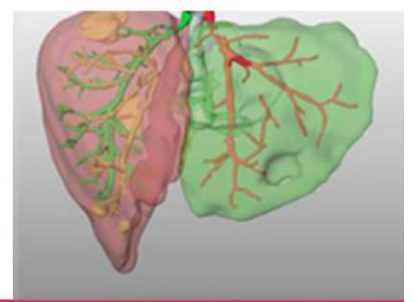
Liver Related Mortality

Unlike ALPPS,
Hypertrophy after PVE (KGR) IS reliable indicator of liver function

MD Anderson
Cancer Center

Making Cancer History





The Selective Staged method... Two-stage Hepatectomy

Stage 1



Portal vein
embolization



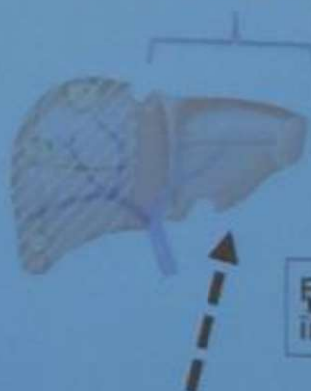
Portal vein
ligation

Tumorectomy
of liver remnant

4-8 weeks

Stage 2

>30% of
total liver

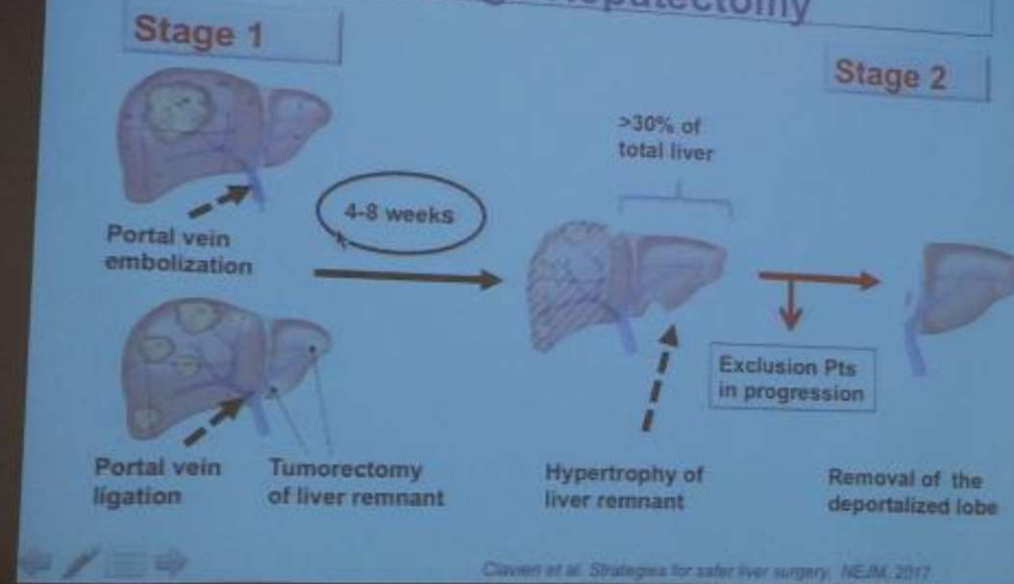


Hypertrophy of
liver remnant

Exclusion Pts
in progression

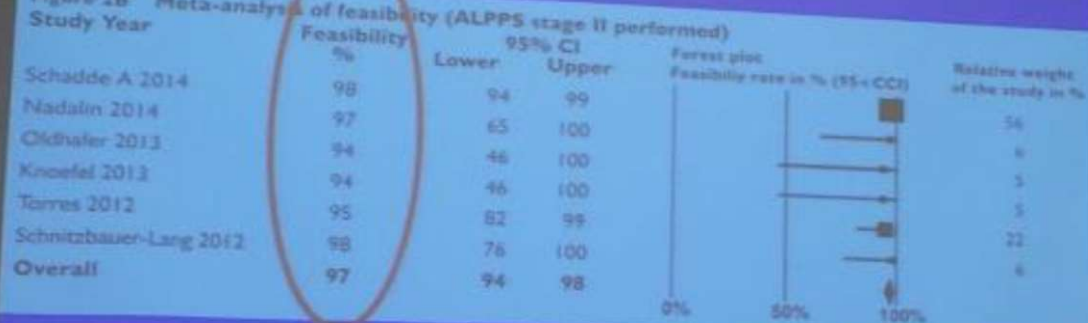
Removal of the
deportalized lobe

The Selective Staged method... Two-stage Hepatectomy



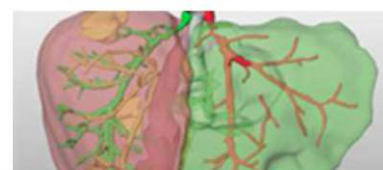
Systematic review of feasibility to achieve resection in ALLPS

Figure 2B: Meta-analysis of feasibility (ALPPS stage II performed)



The feasibility to achieve resection in ALPPS is 97%

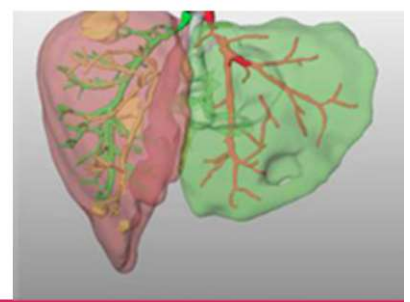
Schadde A, et al. ...Clavien, 2014



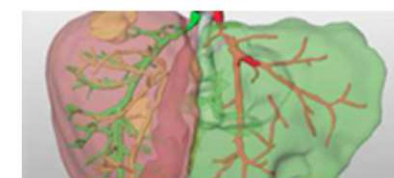
Factors	2-STAGE	ALPPS
Hypertrophy	+	+++
Test of time	Yes	No
Feasibility	70-80%	97%
Hospitalizations	2	1
➡ Advantage : ALPPS		
Mortality	3%	9%
Complications	17-40%	43-73%*
➡ Advantage : 2-Stage		
Survival 2 years	64% (ITT) 78% (success)	60% -
Survival 5 years	31% (ITT) 42% (success)	?
Recurrence	++	



Conclusões



- ❑ Hepatectomia em 2 tempos e ALPPS são complementares.
- ❑ Melhor seleção para o 2º estágio
- ❑ Necessidade de hepatectomia estendida (5-8 + 4 +/-1)
- ❑ Remanescente muito pequeno (10-15%)
- ❑ Fracasso na EVP ou LVP



MGMT. OF COMPLEX CASES IN GI ONCOLOGY

High Mortality Rates After ALPPS: the Devil Is the Indication

Paulo Herman • Jaime Arthur Pirola Krüger •
Marcos Vinícius Perini • Fabrício Ferreira Coelho •
Ivan Ceconello

Table 1 Operative results

	Gender, age, date of first OR	Diagnosis	Indication for ALPPS	Time between first and second OR (days)	Time from second OR to discharge (days)	Complications	FLR hypertrophy (%)
Case 1	M 48 17/11/11	MCRC	Multiple mets and small FLR	7	20	Liver failure Pulmonary sepsis	81
Case 2	M 58 16/02/12	MCRC	Multiple mets and intraoperative decision	7	6	None	78
Case 3	M 58 23/05/12	iCCC	Proximity to the hepatic vein and small FLR	7	8	None	82
Case 4	M 58 07/11/12	MCRC	Multiple mets and small FLR	7	7	None	75
Case 5	F 38 10/04/13	MCRC	Multiple mets and small FLR	7	7		67
Case 6	M 52 17/06/13	MCRC	Multiple mets and small FLR	8	30	Biliary fistula Hepatic insufficiency	37
Case 7	F 55 15/11/13	MCRC	Multiple mets and small FLR	14	8	None	61

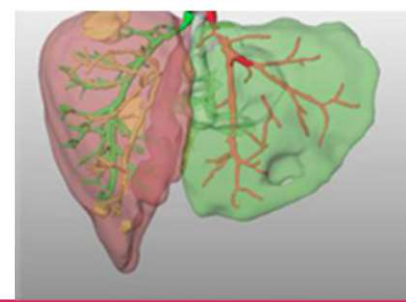
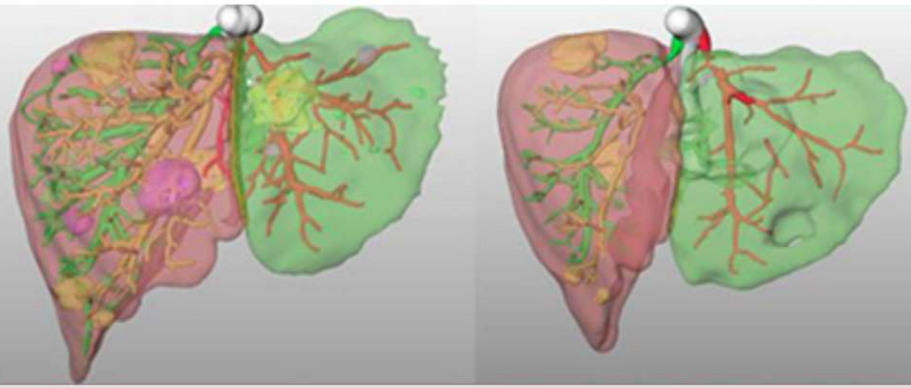


Table 2 Oncological results

	Oncological diagnosis	Disease-free survival or time to recurrence (months)	Site of recurrence	Current state
Case 1	MCRC	6	Lungs	Dead of disease after 2 years
Case 2	MCRC	26	No recurrence	Alive without disease
Case 3	iCCC	6	Lungs	Alive with disease after 25 months
Case 4	MCRC	9	Lungs (resected)	Alive without disease after 19 months
Case 5	MCRC	14	No recurrence	Alive without disease
Case 6	MCRC	6	Liver	Alive with disease after 12 months
Case 7	MCRC	6	Liver	Alive with disease after 7 months



1 st International Consensus Meeting on ALPPS

February 27th and 28th 2015, Hamburg, Germany



IHPBA 2016 • SÃO PAULO

**12TH WORLD CONGRESS OF THE INTERNATIONAL
Hepato-Pancreato-Biliary Association**

April 20-23 2016 - Brazil

SHERATON WTC - SÃO PAULO

Obrigado!