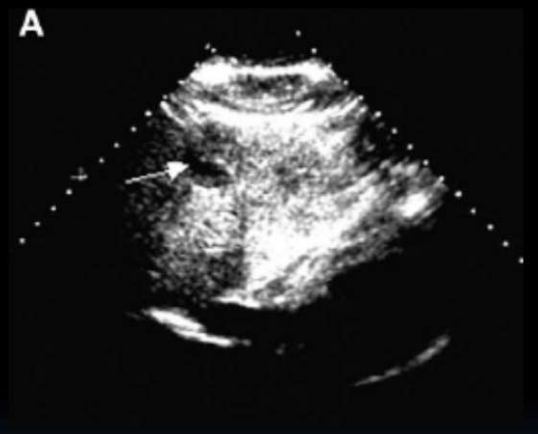
IHPBA

International Hepato-Pancreato-Biliary Association

Hepatectomia com radiofrequência Habib 4x



Orlando Jorge Martins Torres
Professor Livre-Docente UFMA
NEF - Núcleo de Estudos do Fígado

Complicações da ressecção hepática

Reference	Years of study	No of centers	No of resections	Case-mix	Mortality	Morbidity
Imamura et al.	1994–2002	1	1056	50% HCC 29% cirrhotic	0%	39%
Rees et al.	1987–2005	1	1005	100% CRLM	1.5%	25.9%
Wei et al.	1992–2002	2	423	100% CRLM	1.7%	19.6%
Malik et al.	1993–2006	1	687	100% CRLM	3.0%	29.5%
Jarnagin et al.	1991–2001	1	1803	62% CRLM 10% HCC	3.1%	45.0%
Belghiti et al.	1990–1997	1	747	Elective & emergency. 35% benign 28% HCC 17% CRLM 32% cirrhotic	4.4% all 3.9% elective 8.7% cirrhotic 25.0% emergency	22.0%
Poon et al.	1989–2003	1	1222	60% HCC 33% cirrhotic	4.9%	32.4%

Poston G, D' Angelica M, Adam R, 2011

Preditores de morbidade

Reference	Years of study	No of resections	Predictors of morbidity
Jarnagin et al.	1991–2001	1803	Estimated blood loss Extent of resection + EH procedure ↑ preoperative creatinine Hypoalbuminemia Medical comorbidity Male gender
Belghiti et al.	1990–1997	478 elective resections, no cirrhotics	ASA score Extent of resection Steatosis Blood transfusion + EH procedure
Poon et al.	1989–2003	1222	Thrombocytopenia Blood transfusion + EH procedure

Abbreviation:+EH Procedure, additional extra-hepatic procedure.

Poston G, D' Angelica M, Adam R, 2011

Complicações da ressecção hepática

	General complications	Specific complications
Immediate (on table)	• Hypothermia	• Bleeding
Early (days)	• Respiratory—atelectasis, pleural effusion, pneumonia • Cardiovascular—DVT, PE, MI, arrhythmias, CVA • Renal failure • Wound infection • Pain	• Bleeding • Bile leak • Hepatic insufficiency • Intra-abdominal abscess
Late (weeks/months)	• Incisional hernia	• Biliary stricture

Abbreviations: DVT, deep vein thrombosis; PE, pulmonary embolus; MI, myocardial infarction; CVA, cerebrovascular accident.

Poston G, D' Angelica M, Adam R, 2011

Complicações da ressecção hepática

- Derrame pleural direito
- Abscesso subfrênico
- Sangramento
- Fístula biliar
- Ascite
- Insuficiência hepática
- Infecção da ferida

Adam et al – Surg Clin N Am 84:659-671,2004

Ressecção hepática

- **Sangramento**
  - Artéria hepática
  - Veia porta
  - Veias hepáticas
- **Insuficiência hepática**
  - Remanescente hepático

Adam et al – Surg Clin N Am 84:659-671,2004

Sangramento

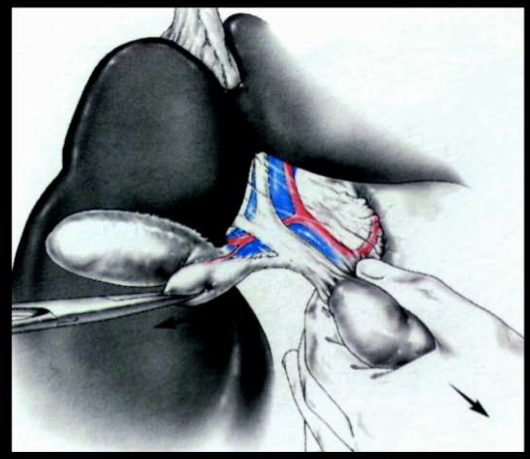
- Cuidados na anestesia
- Manobra de Pringle/exclusão total
- US intra-operatória
- Ressecções anatômicas
- Avanços tecnológicos:
  - Bisturi bipolar + SF 0,9%
  - Ligasure Impact
  - Bisturi de argônio
  - Habib 4x
  - Hemostático Tachosil

Abdalla EK, Vauthey JN. Dig Surg 2008;25:421-9

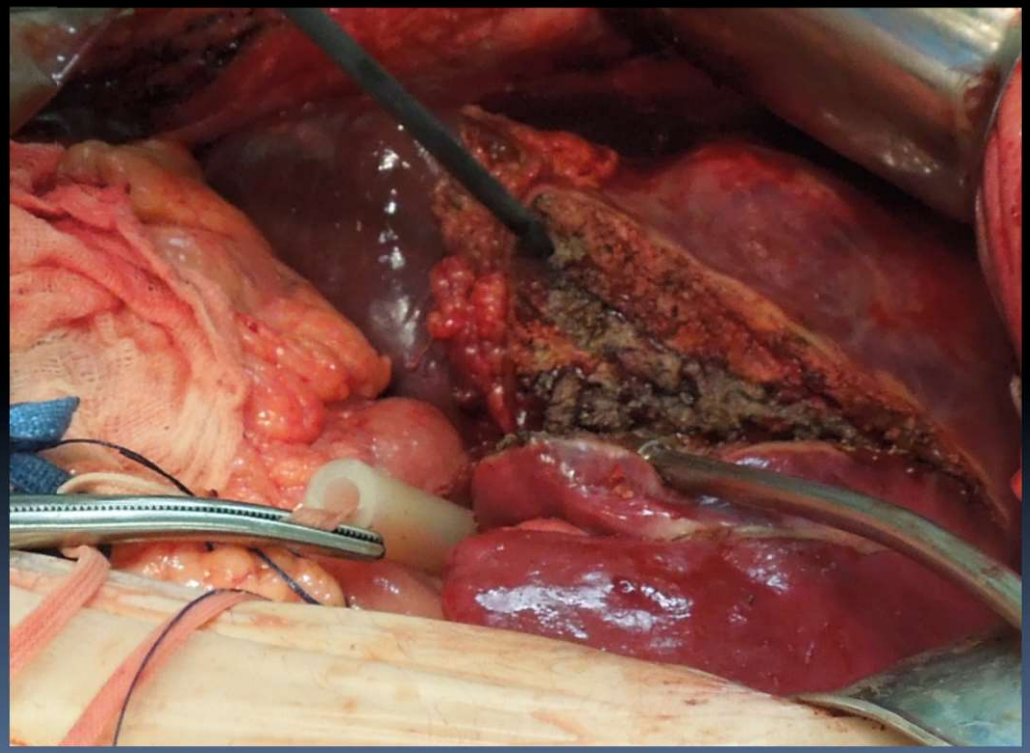
Sangramento

- Anestesia hipotensiva
- Manobra de Pringle
- Exclusão vascular total

Fatores relacionados com morbidade



- Manobra de Pringle
- Transfusão sanguínea

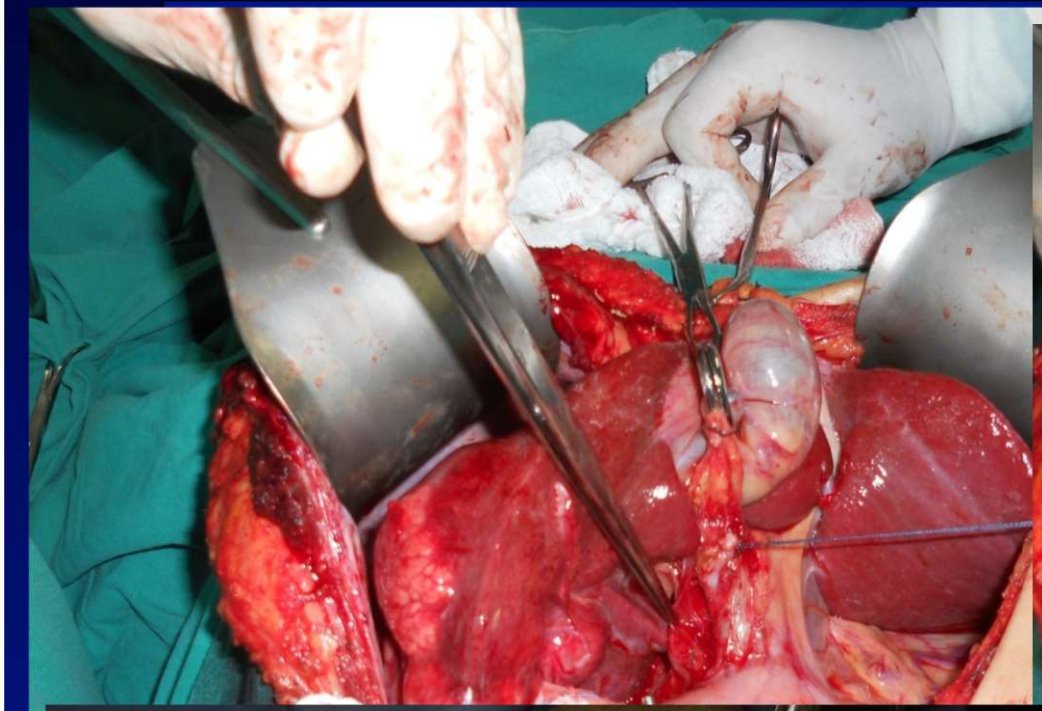


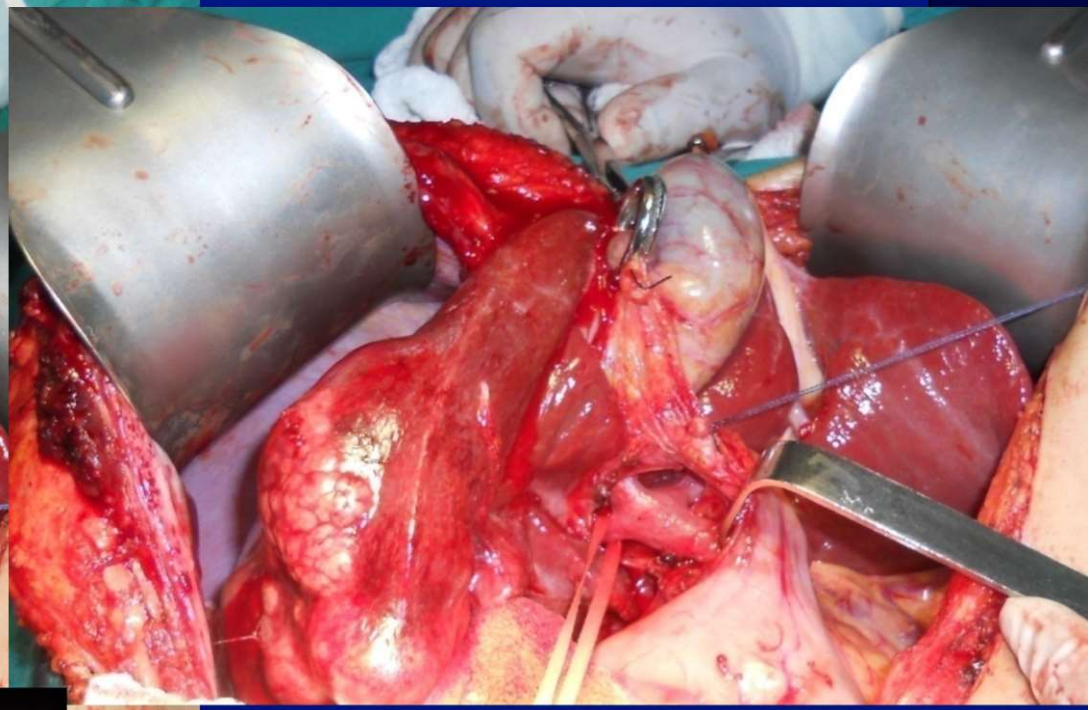
Adam et al – Surg Clin N Am 84:659-671,2004

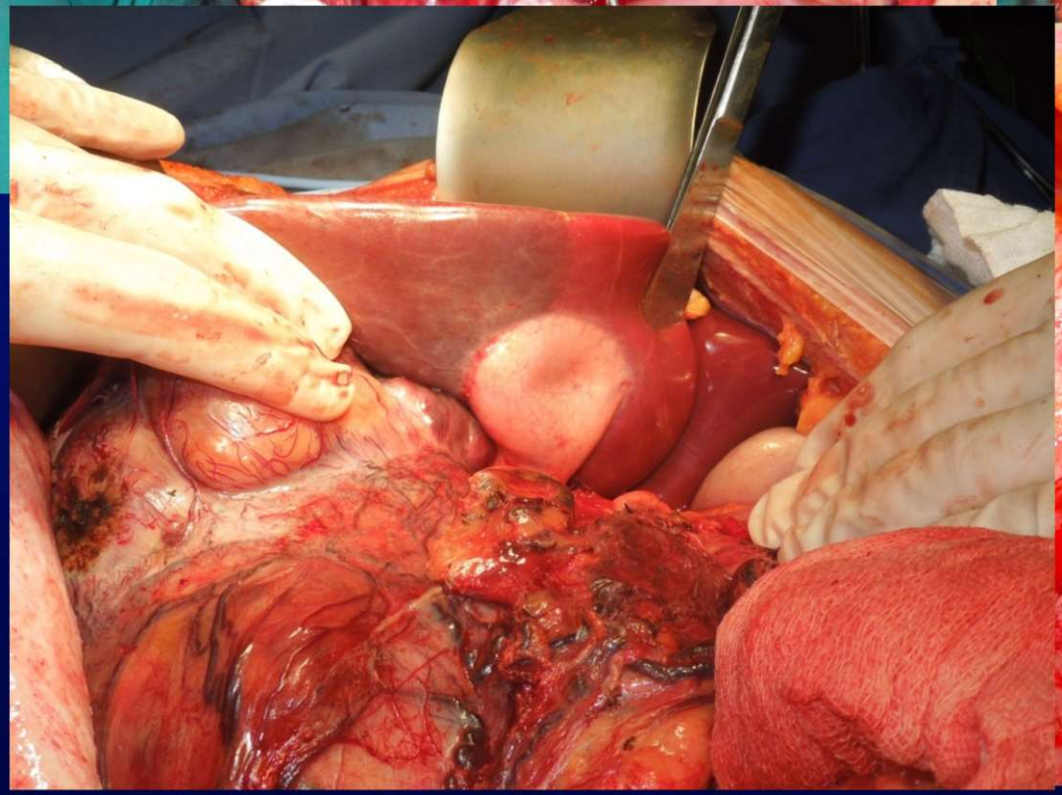
Ressecções anatômicas

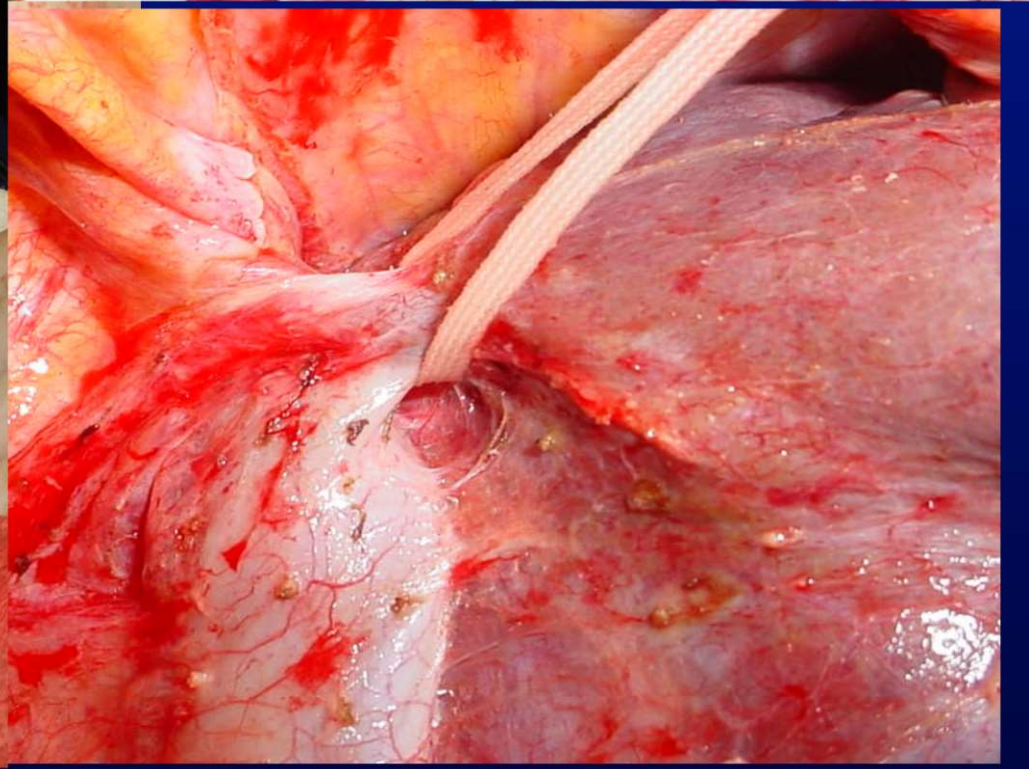
- Baseadas:
  - No pedículo vasculobiliar
  - Nas veias hepáticas

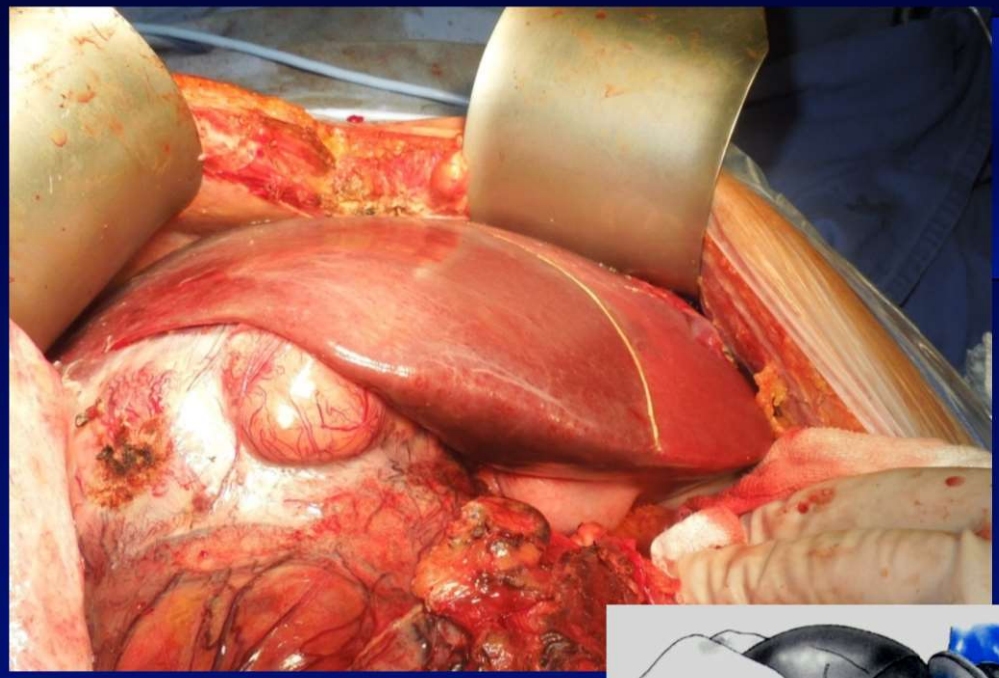
Abdalla EK, Vauthey JN. Dig Surg 2008;25:421-9

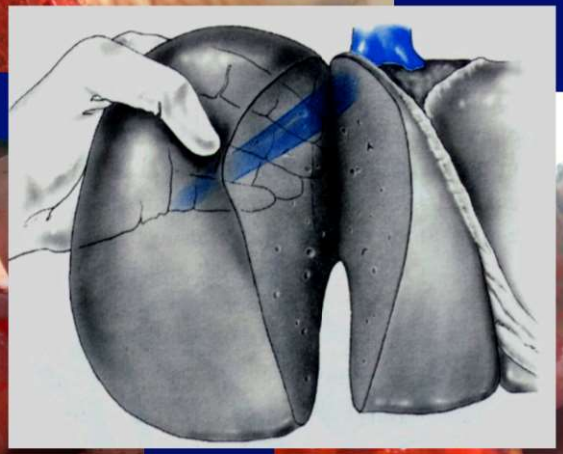


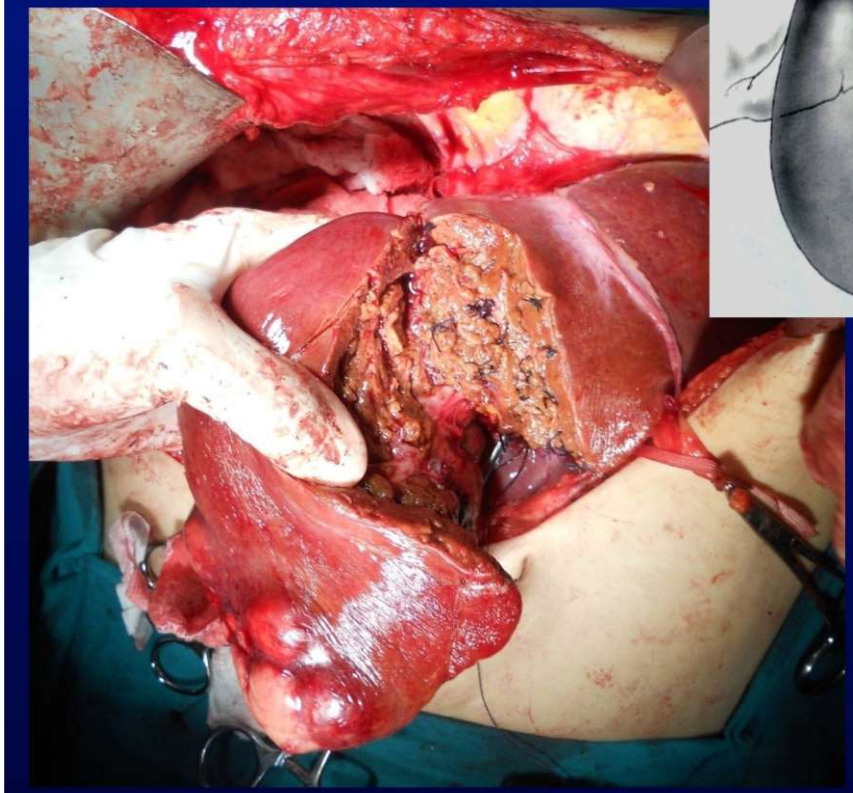


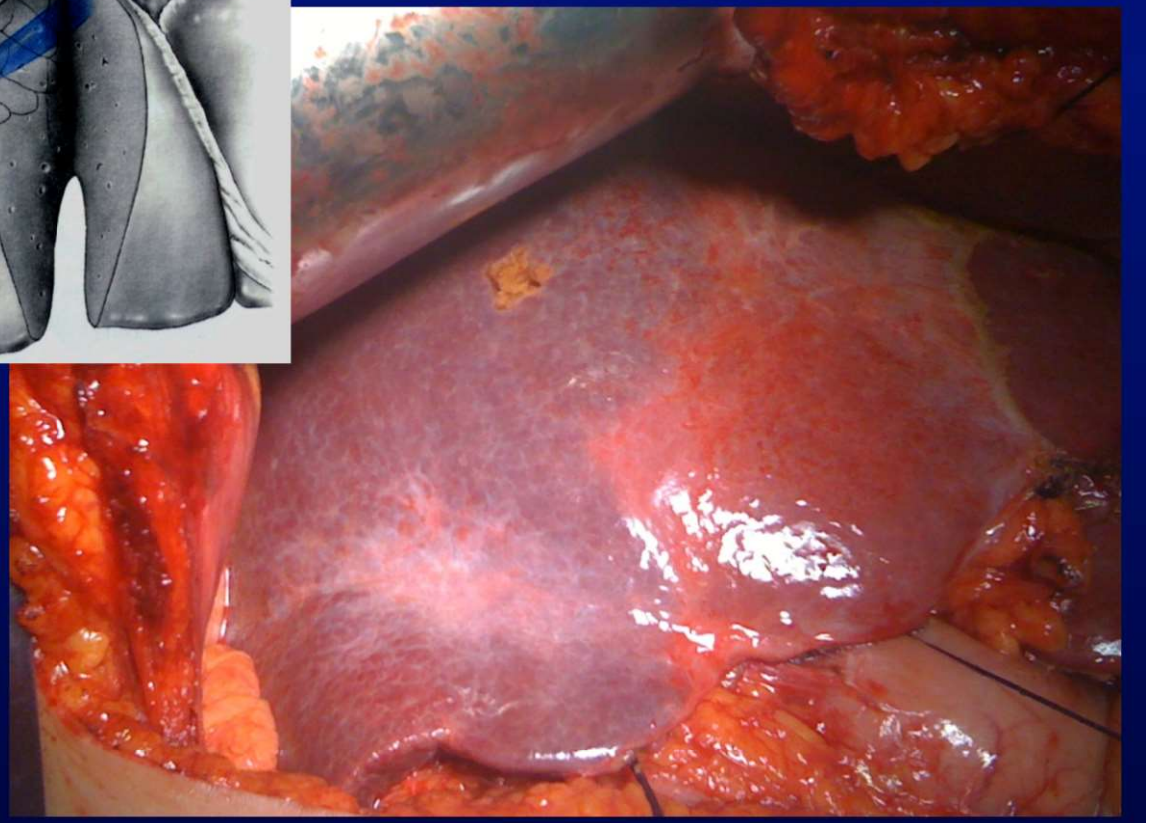


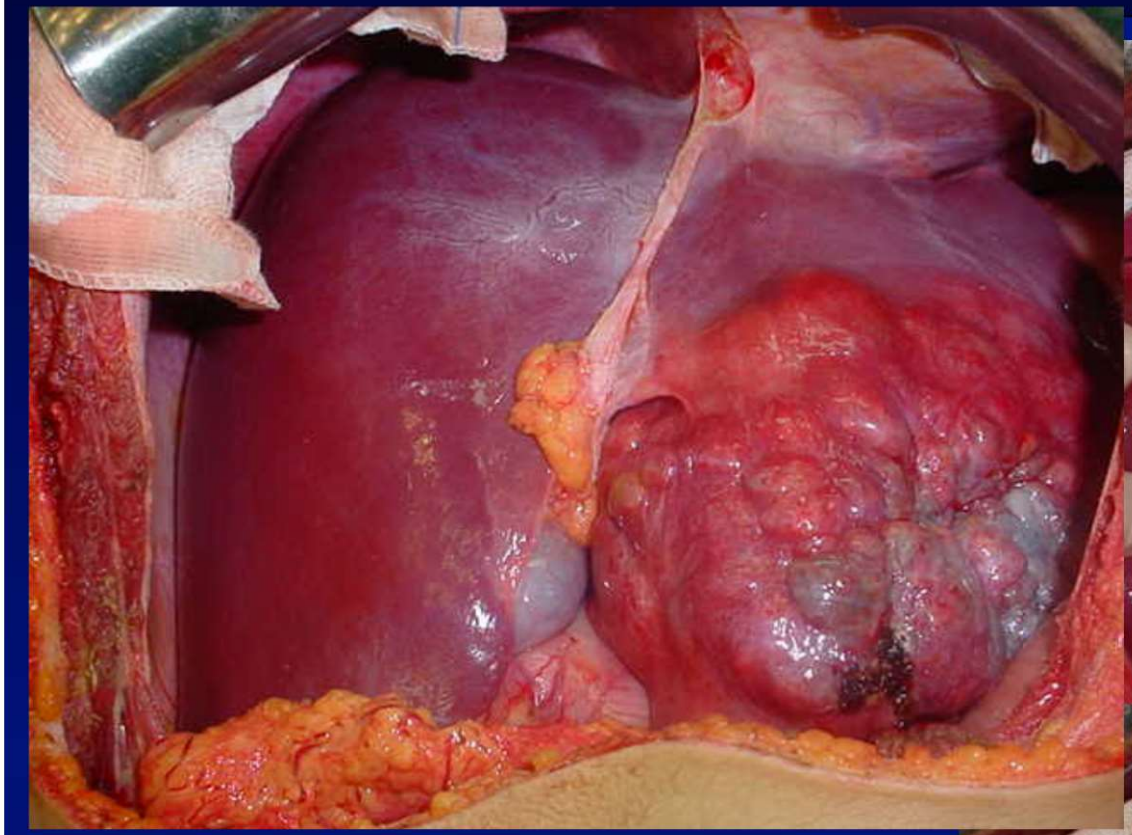


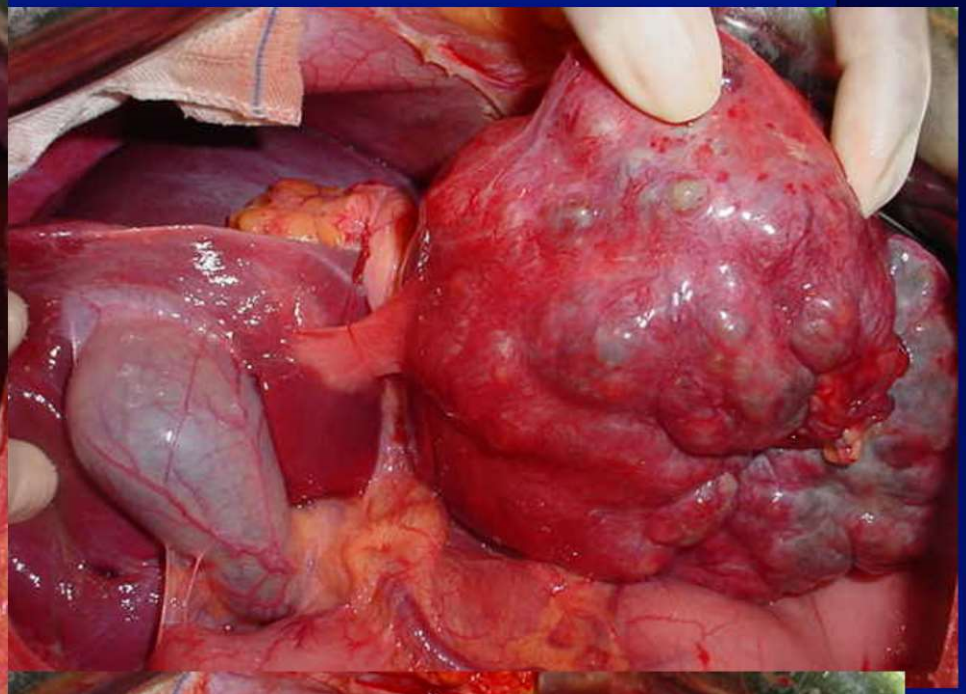


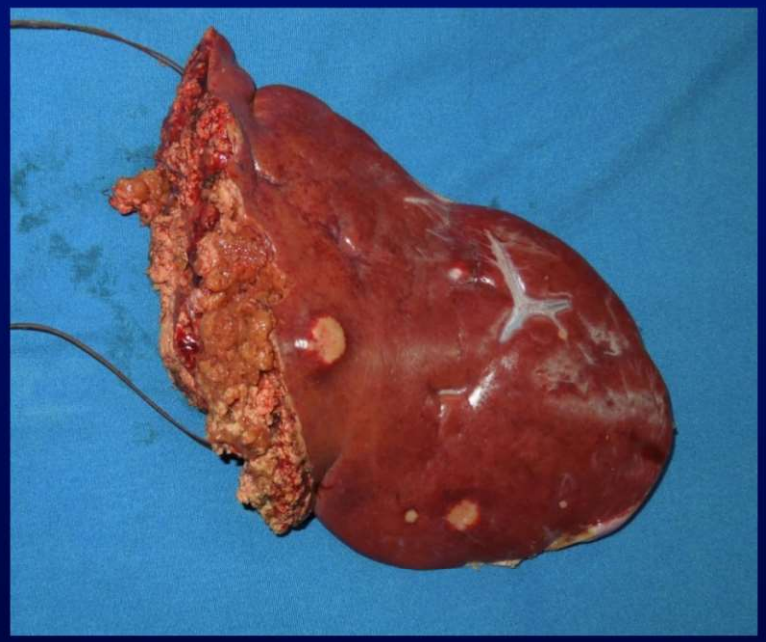


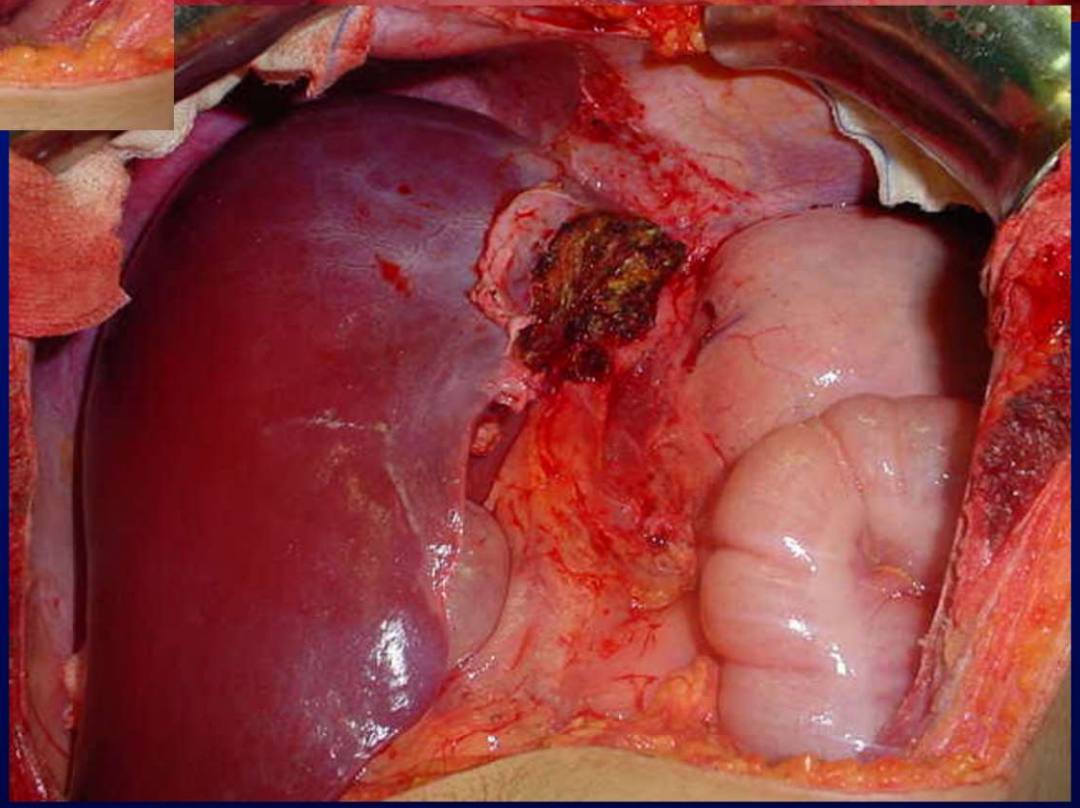


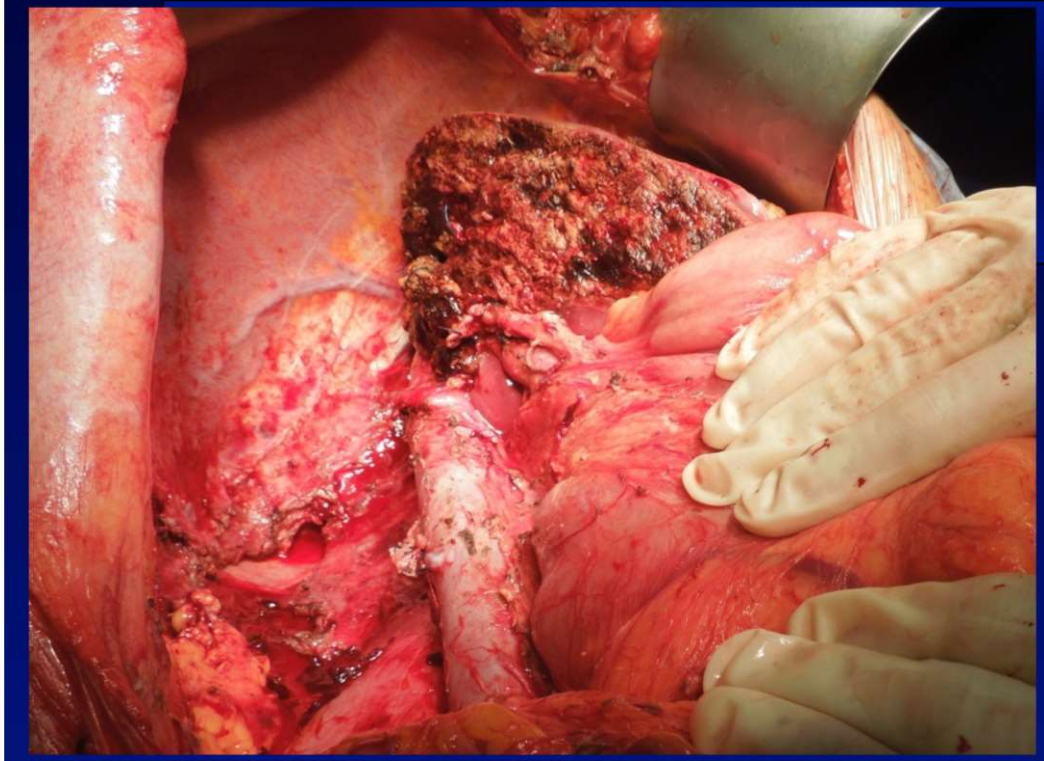


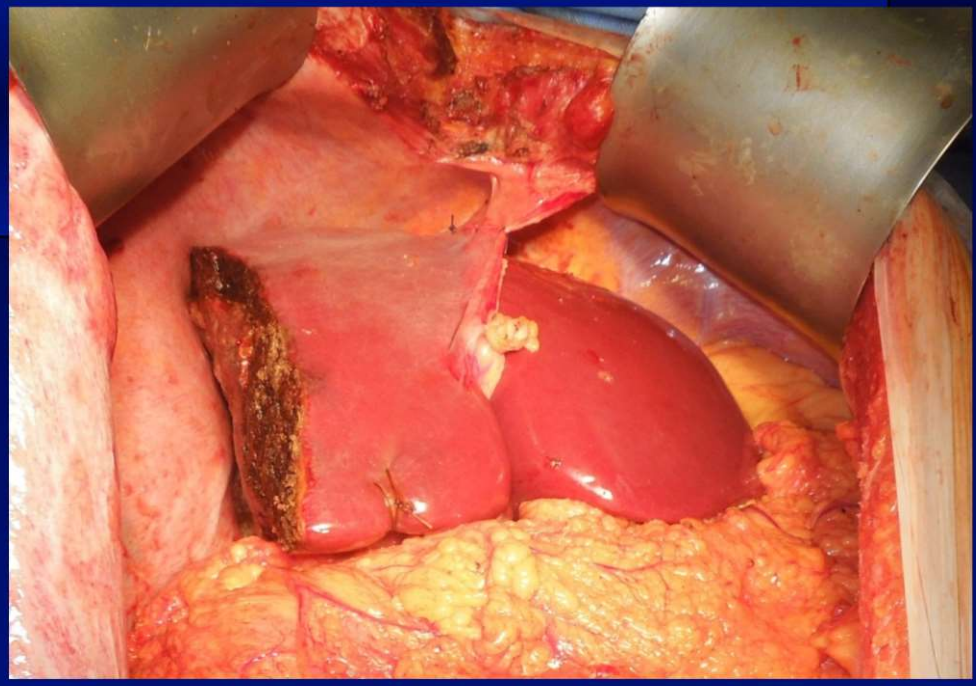








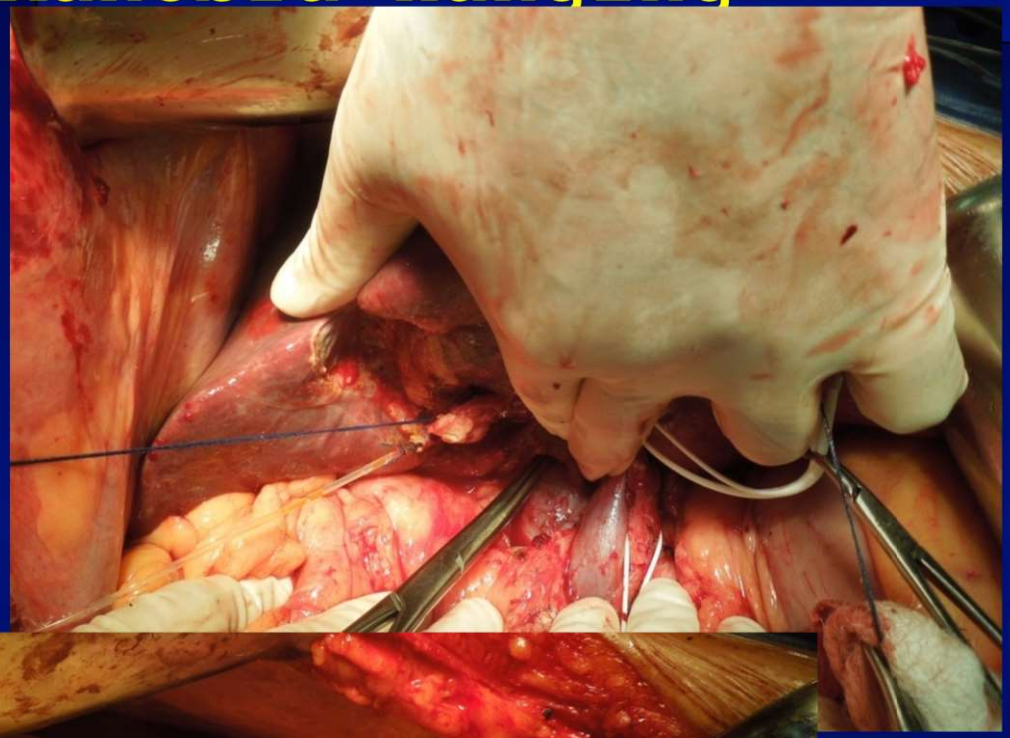


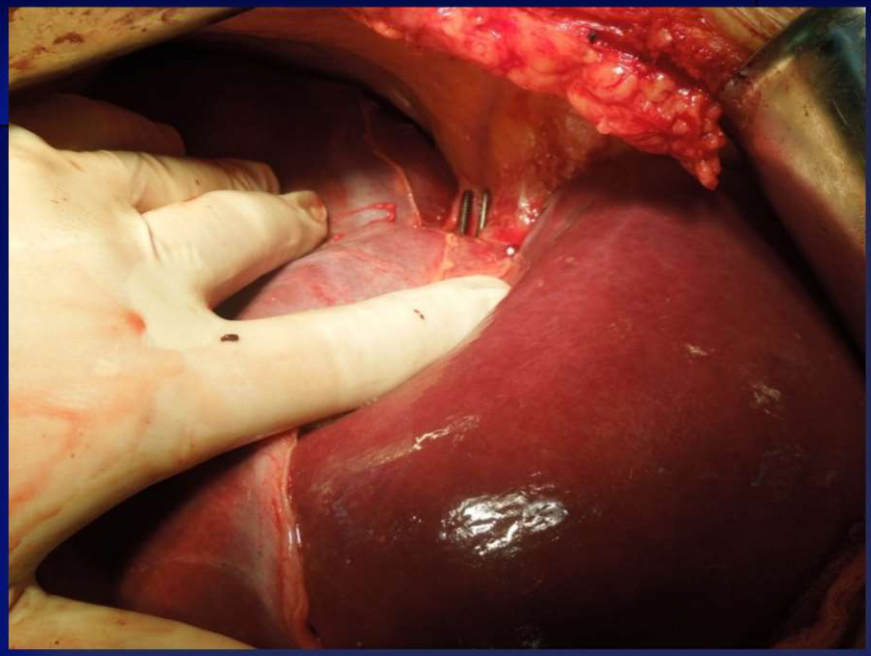


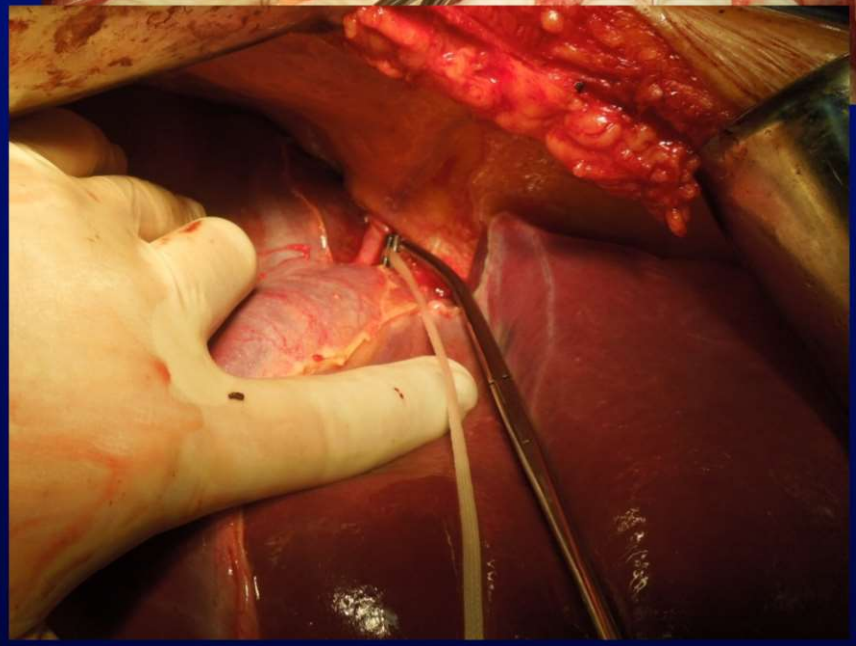

UPi Hospital

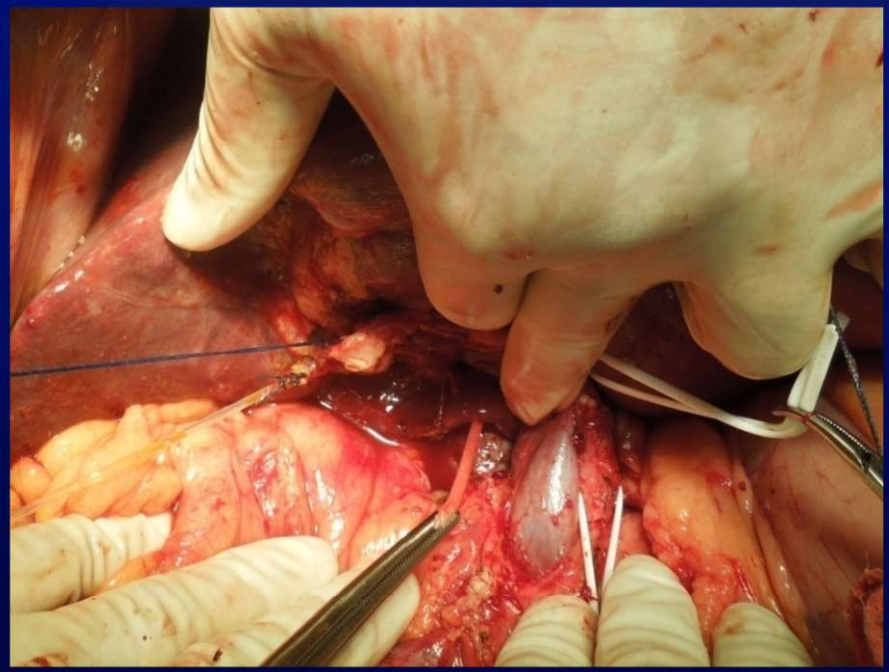
Ressecções anatômicas

Manobra Hanging



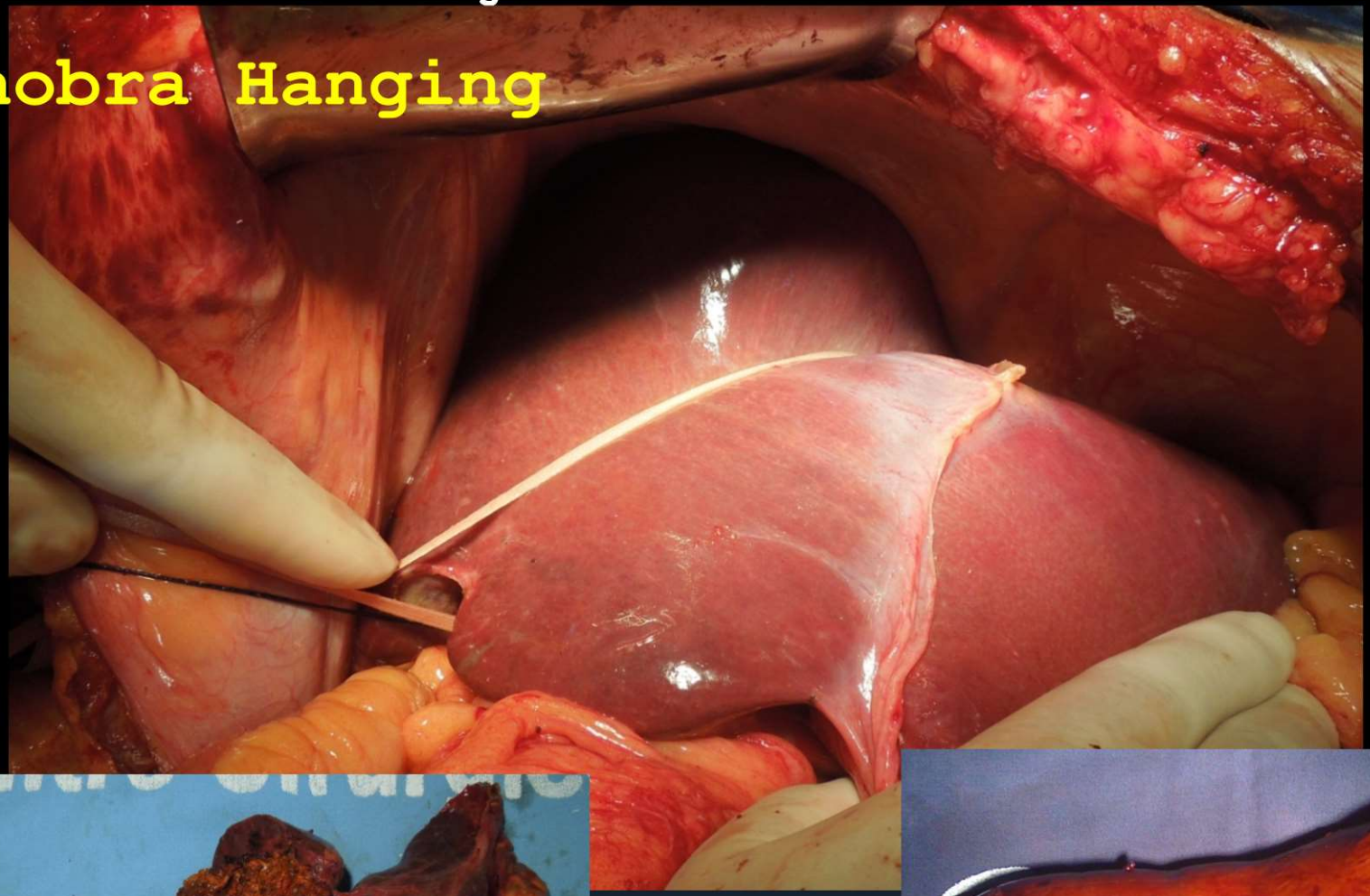






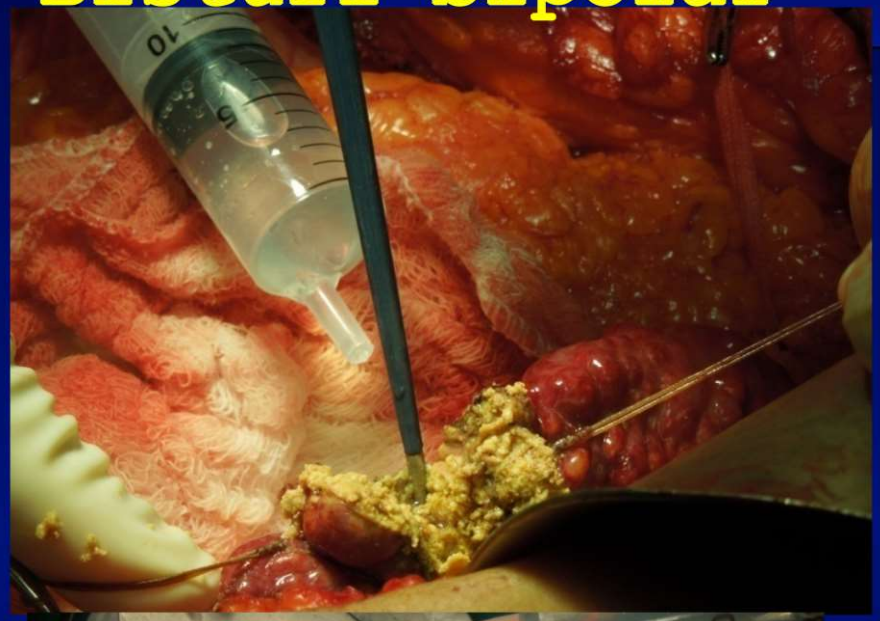
Ressecções anatômicas

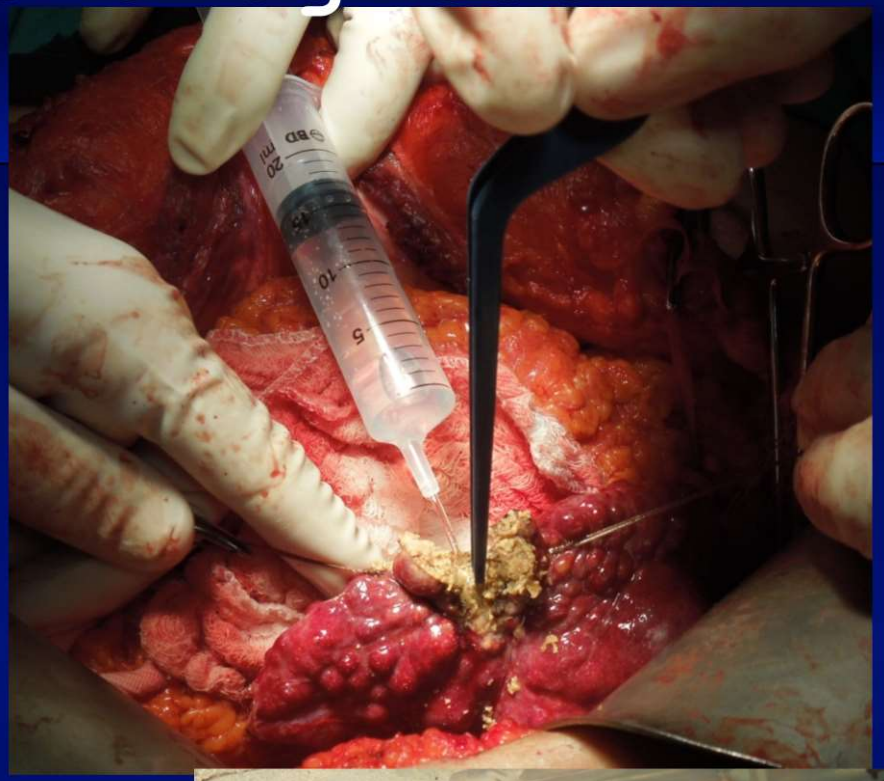
Manobra Hanging

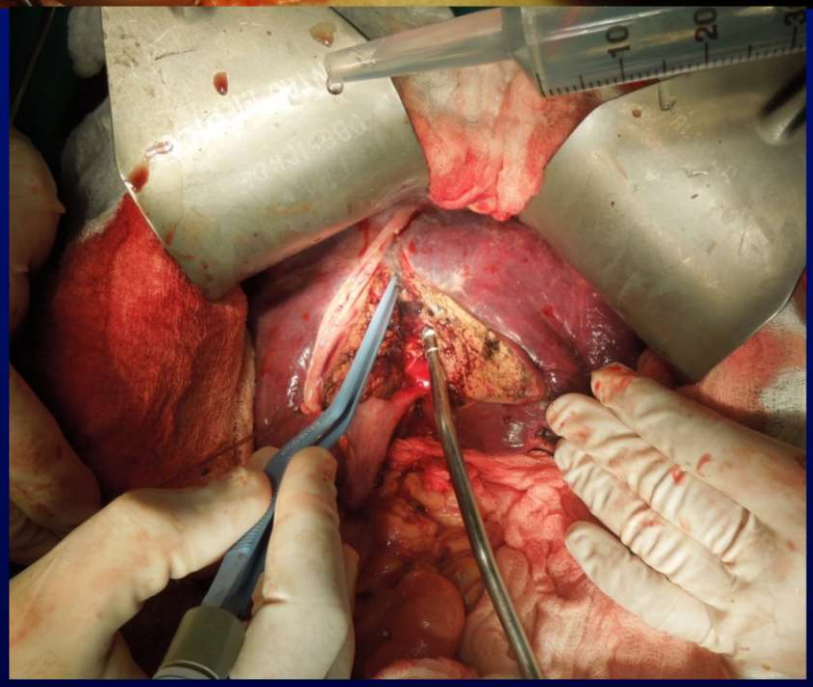


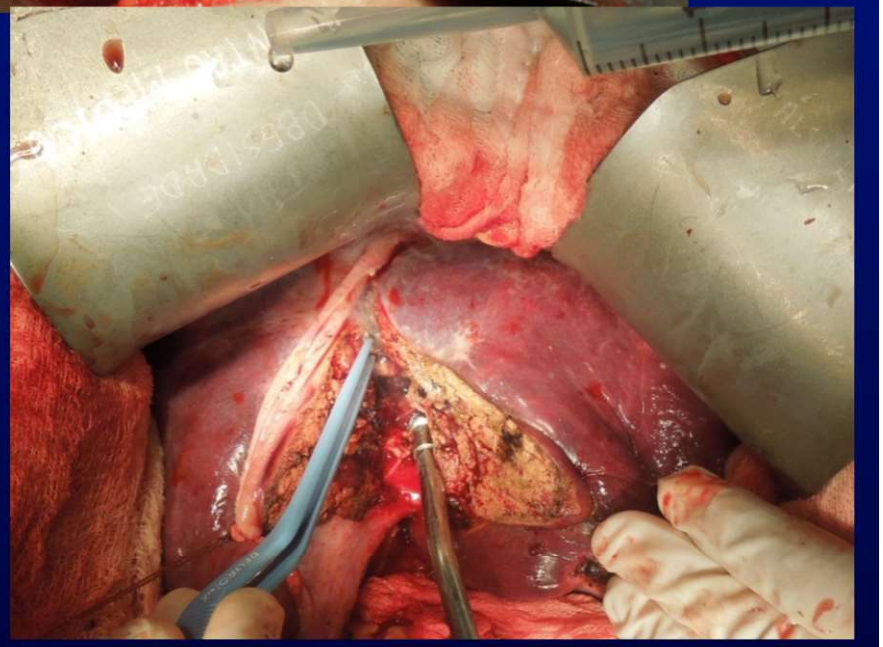
Avanços tecnológicos

Bisturi bipolar



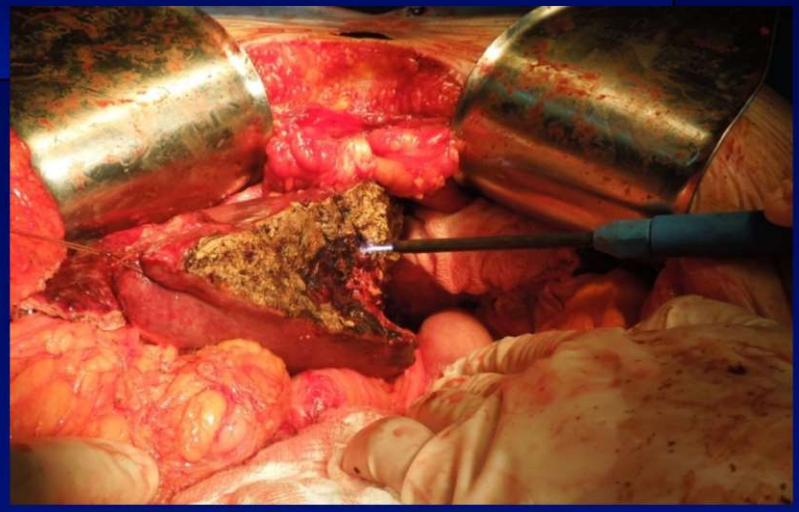


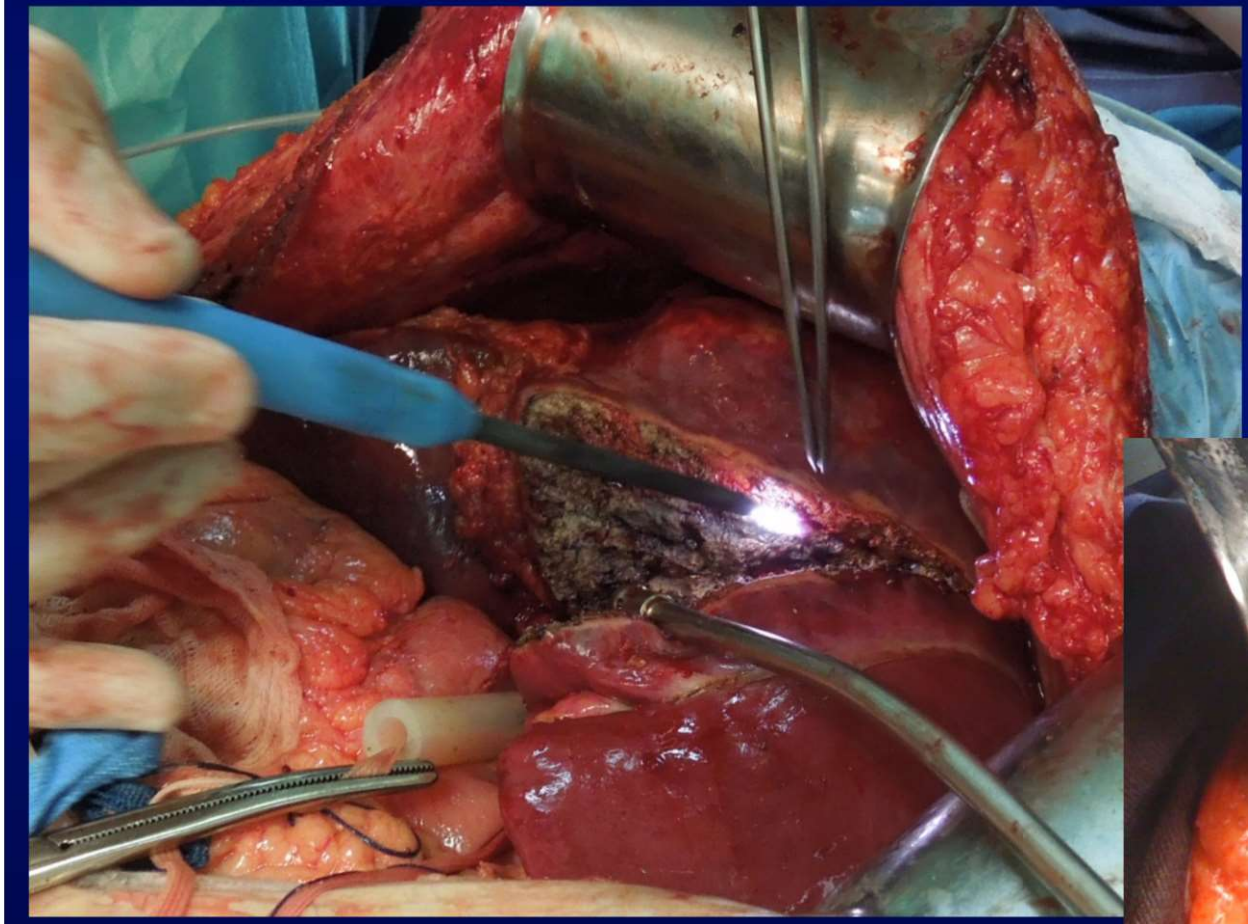


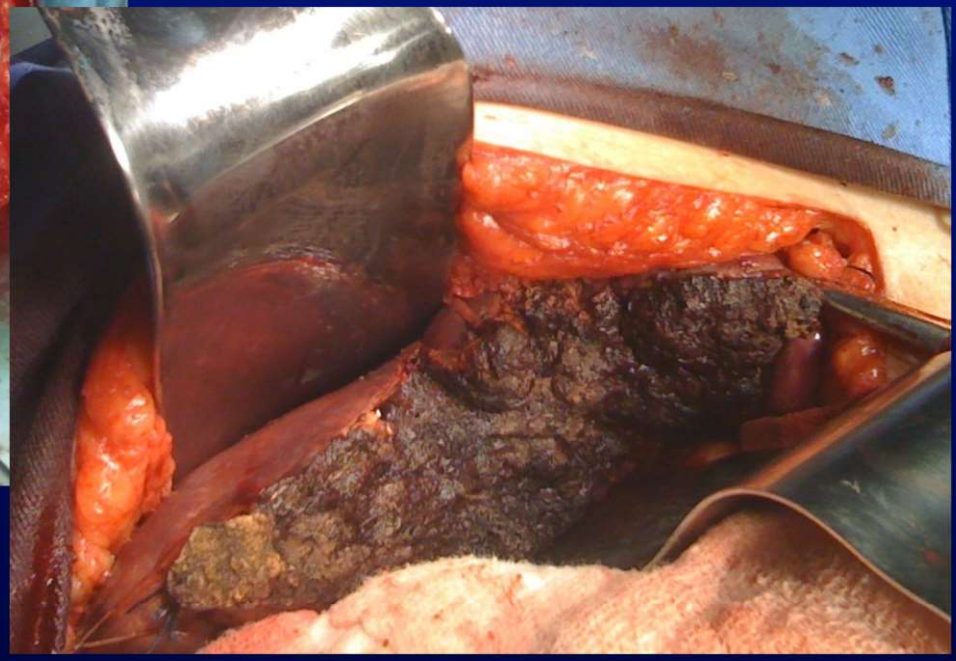


Avanços tecnológicos

Bisturi de Argônio

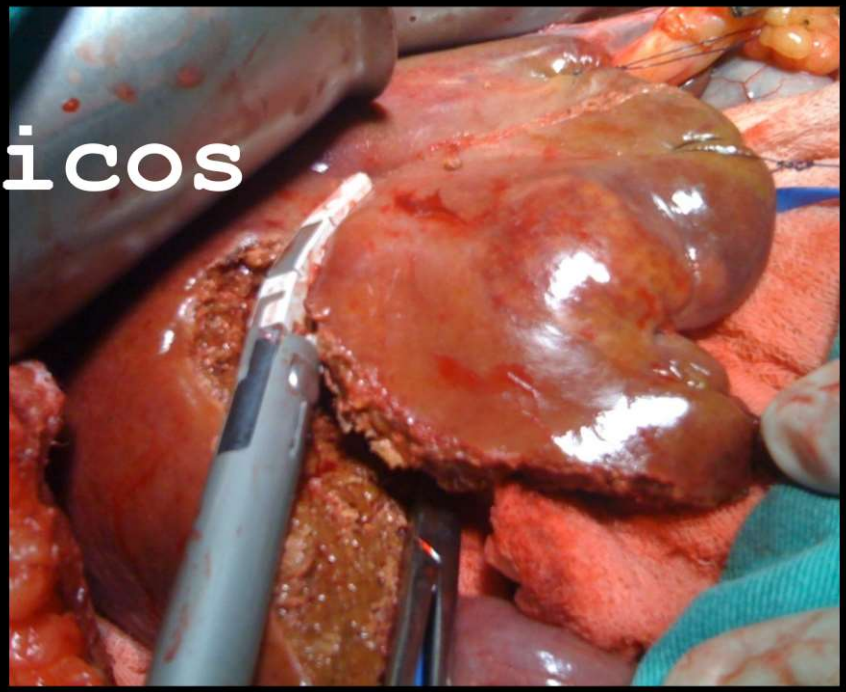


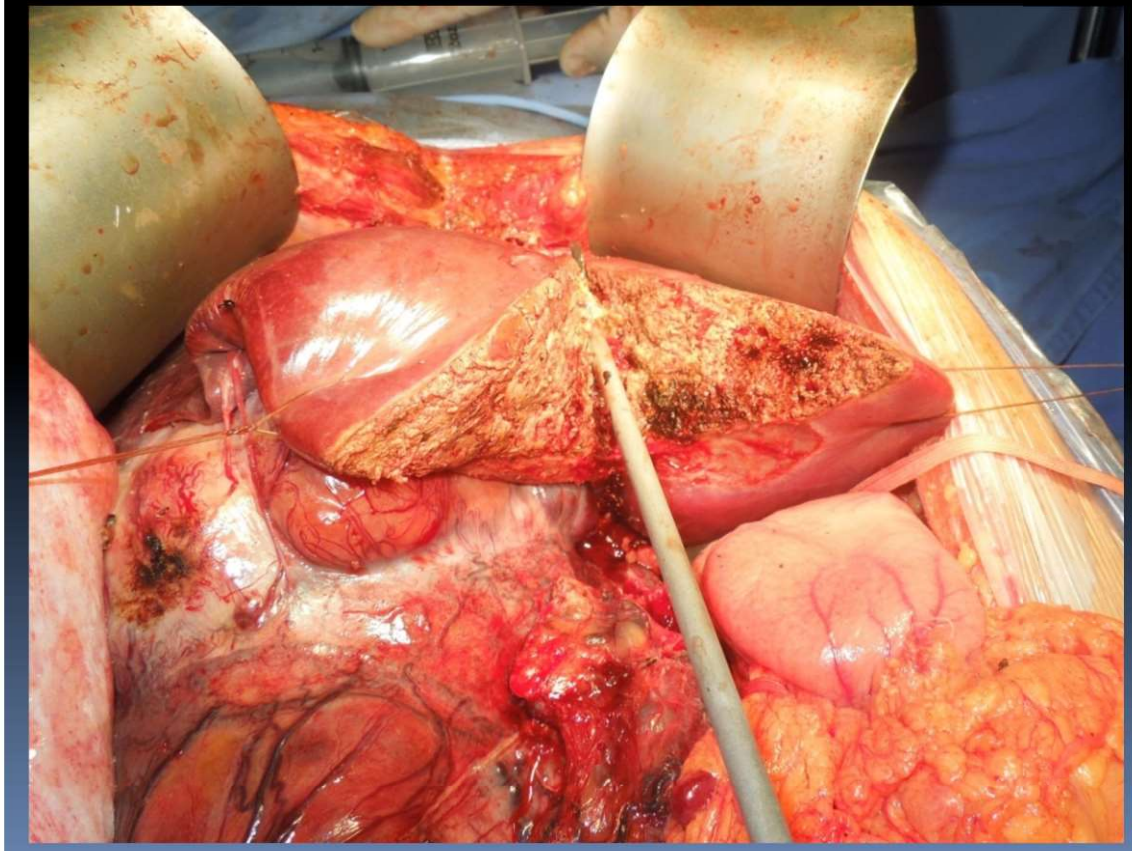


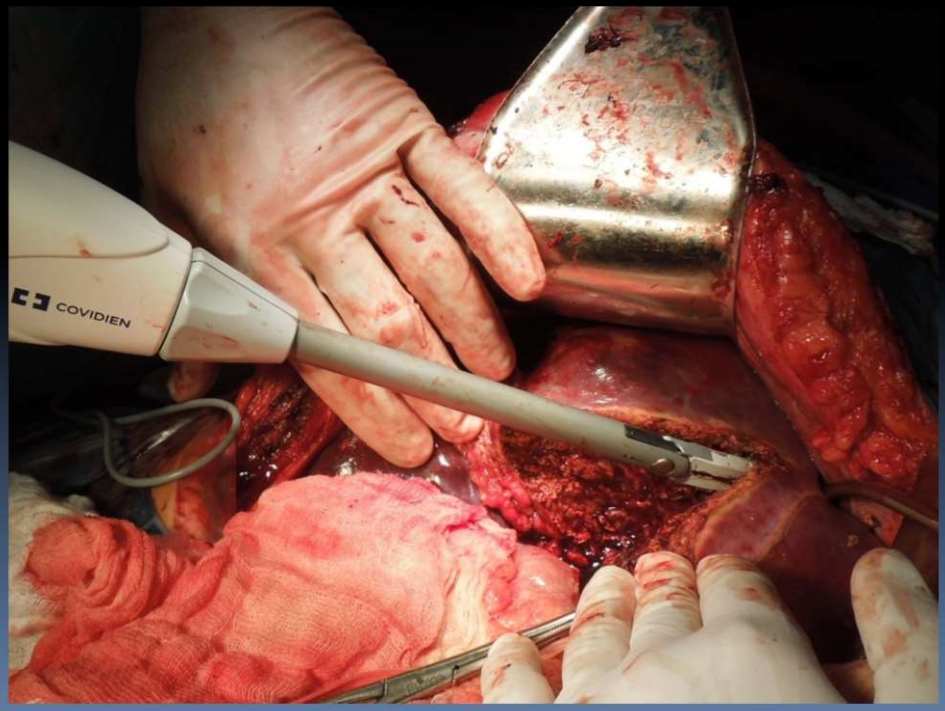


Avanços tecnológicos

Ligasure
Ultracision
Enseal

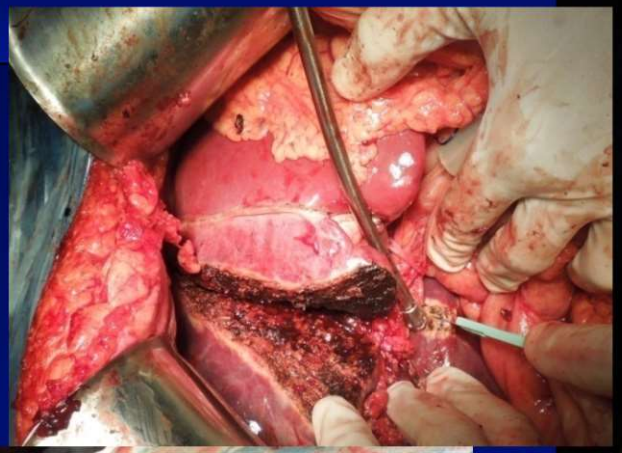


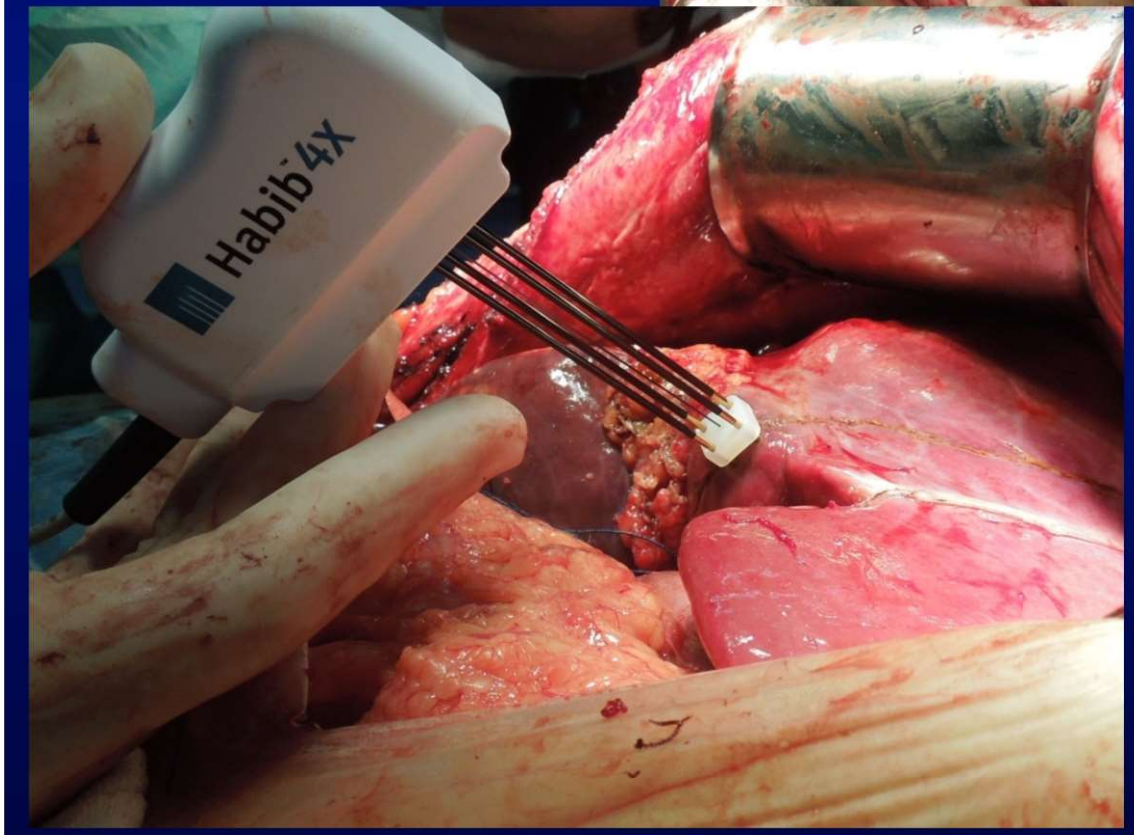


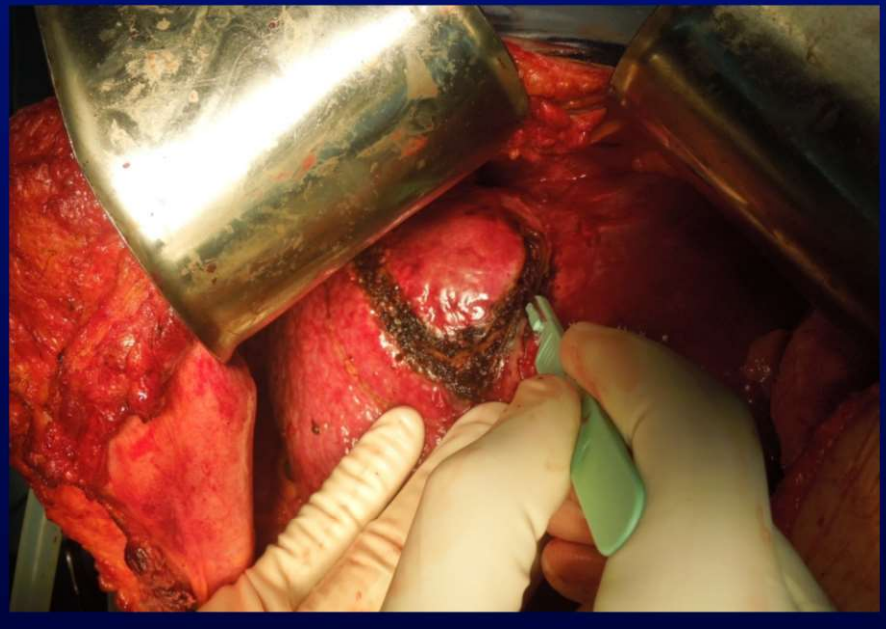


Avanços tecnológicos

Habib 4x

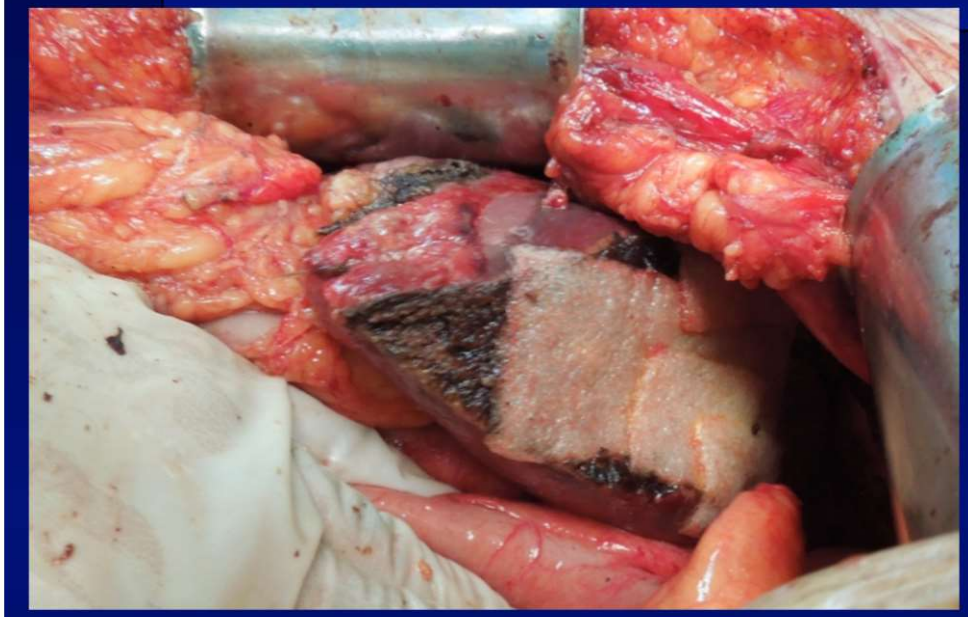


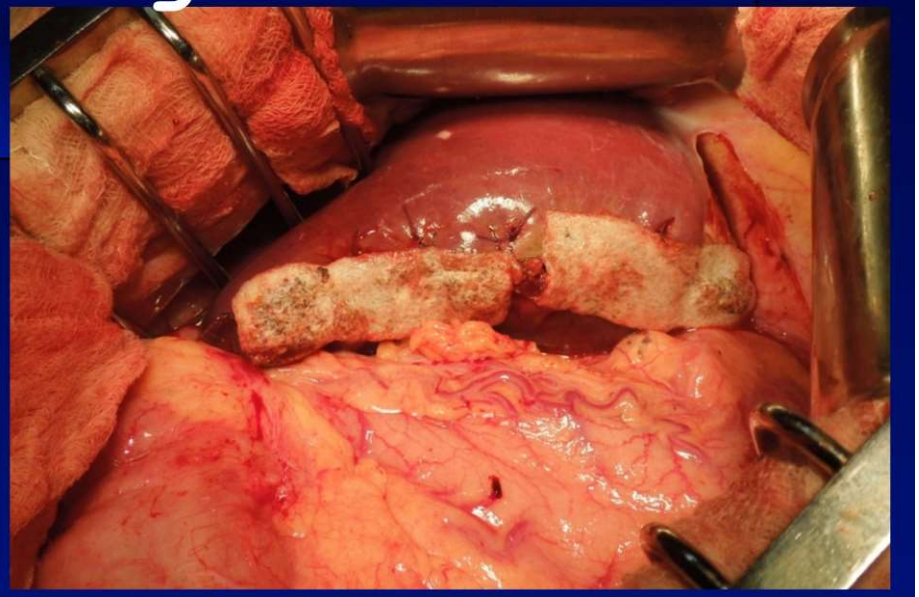


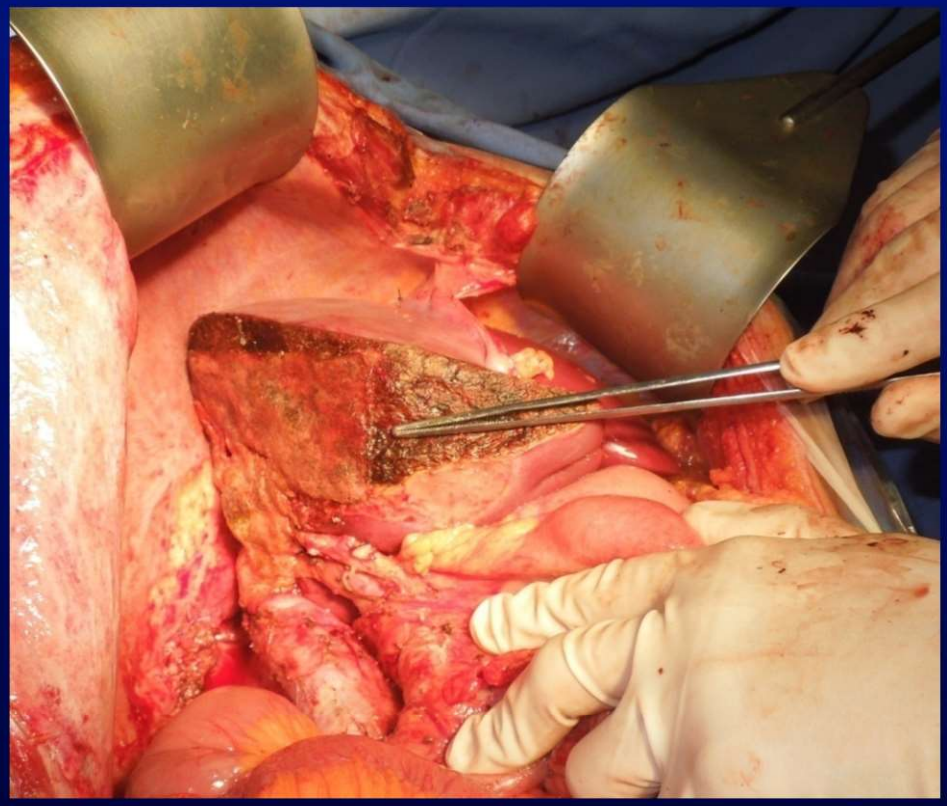


Avanços tecnológicos

Hemostático Tachosil®

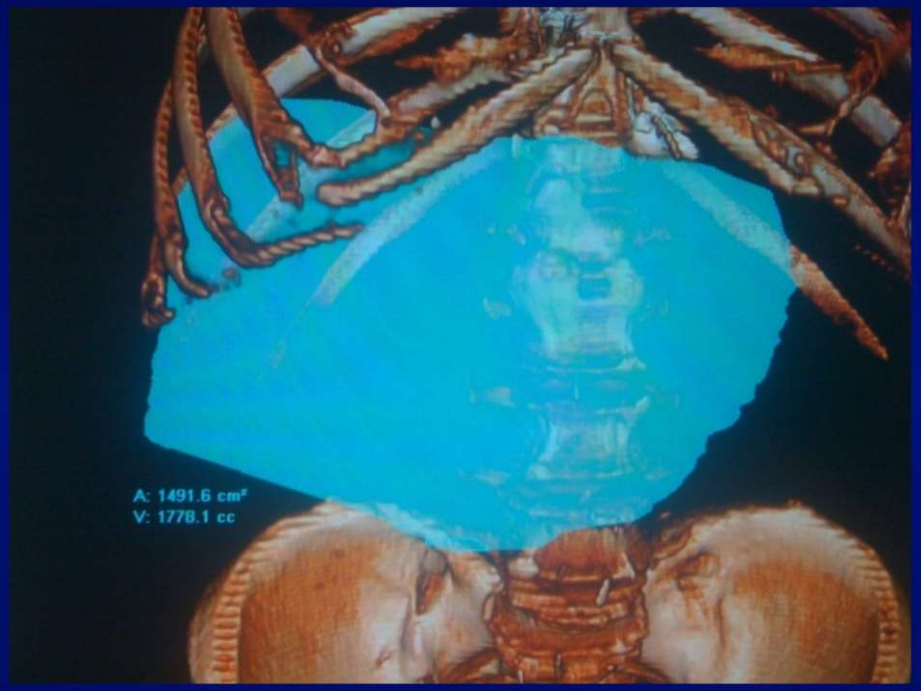


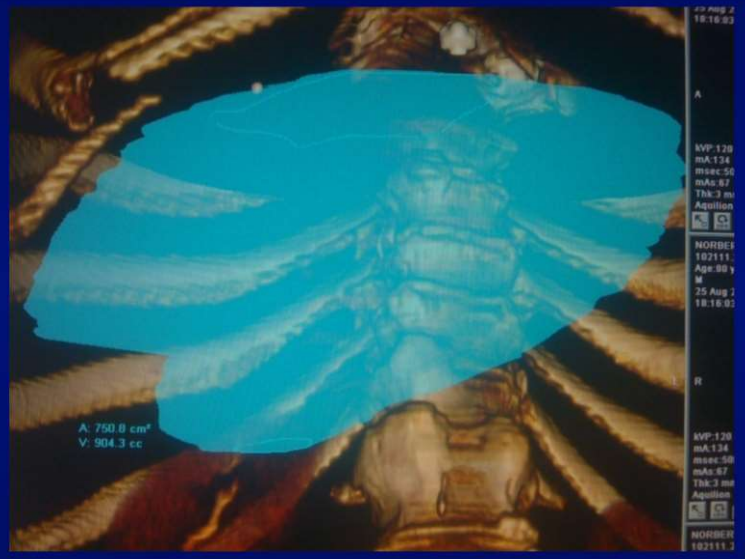




Avanços tecnológicos

Volumetria e hepatectomia virtual





Volume 1.778,1 cc

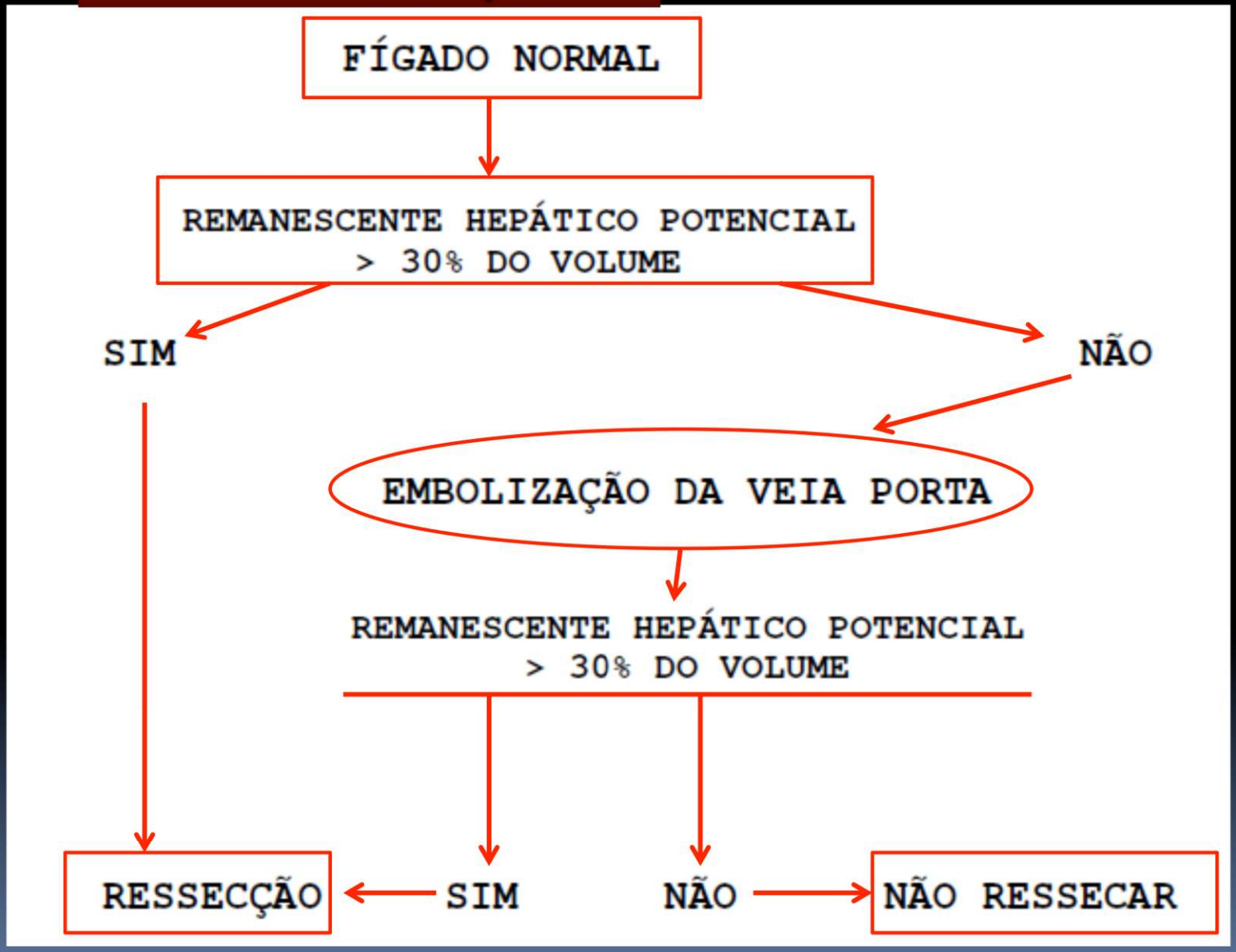
Volume 904,3 cc

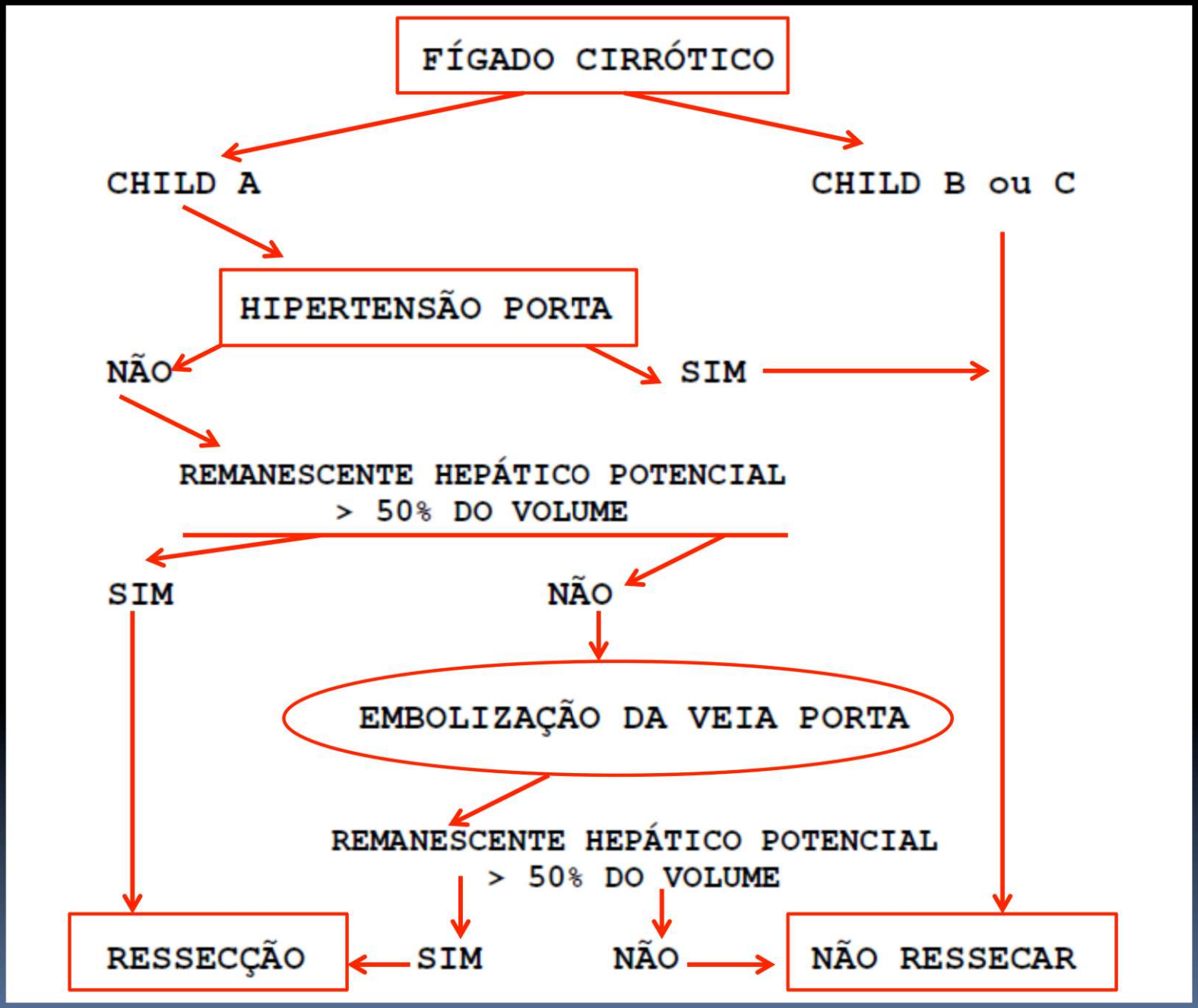
Insuficiência hepática

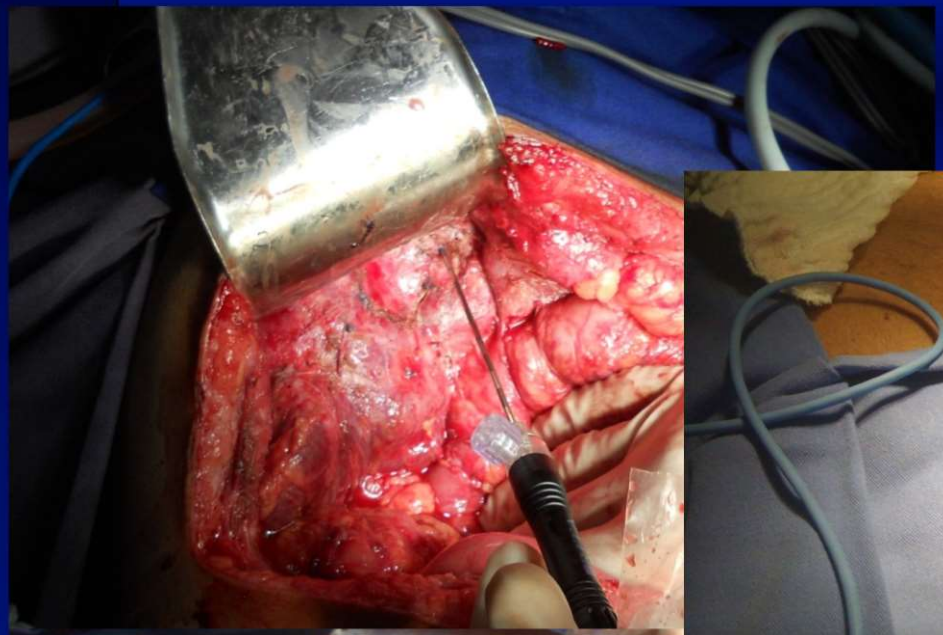
- Remanescente hepático
  - Fígado normal
  - Fígado doente

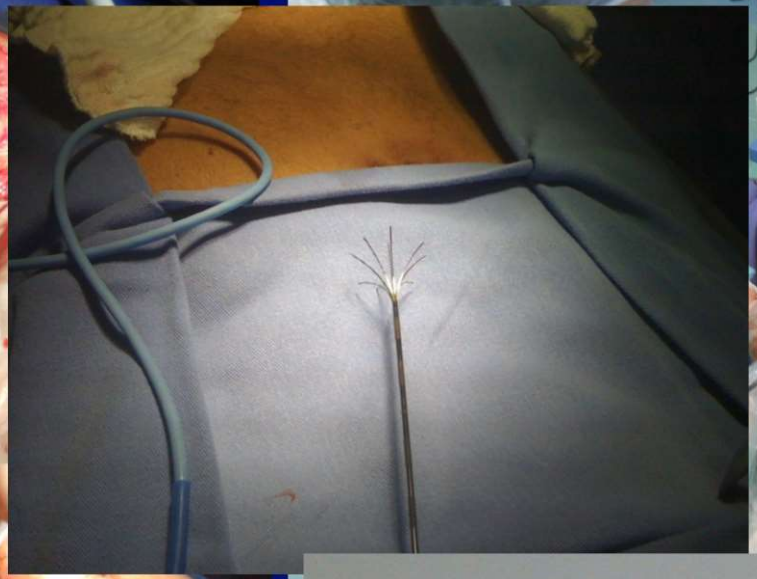
Abdalla EK, Vauthey JN. Dig Surg 2008;25:421-9

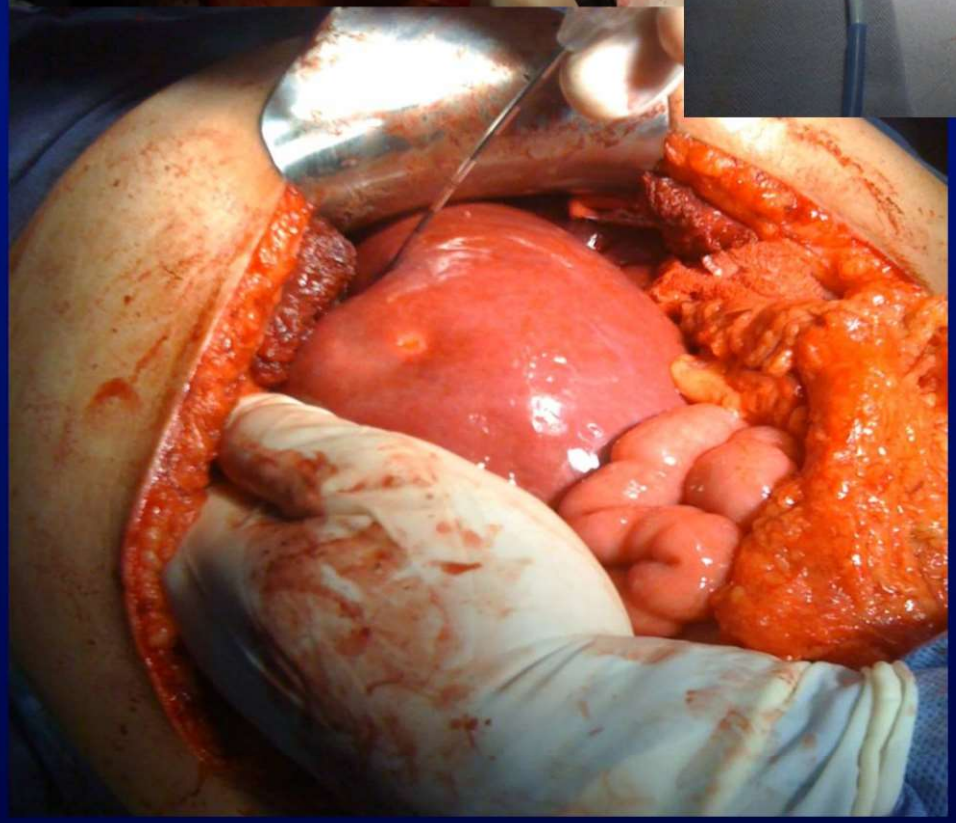
Insuficiência hepática




FÍGADO CIRRÓTICO
CHILD A
CHILD B ou C
HIPERTENSÃO PORTA
NÃO
SIM
REMANESCENTE HEPÁTICO POTENCIAL
> 50% DO VOLUME
SIM
NÃO
EMBOLIZAÇÃO DA VEIA PORTA
REMANESCENTE HEPÁTICO POTENCIAL
> 50% DO VOLUME
RESSECÇÃO
SIM
NÃO
NÃO RESSECAR



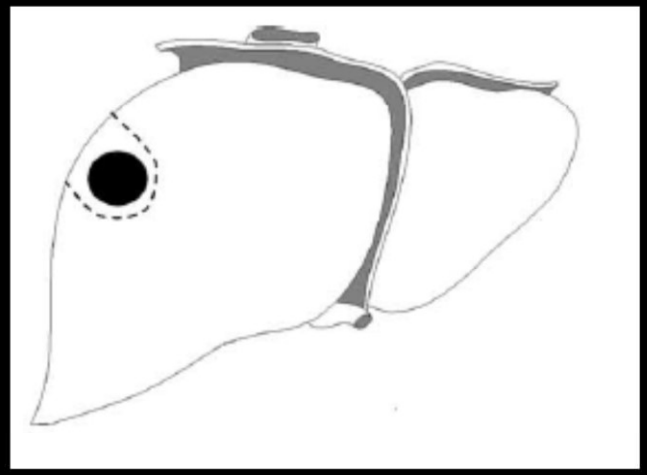


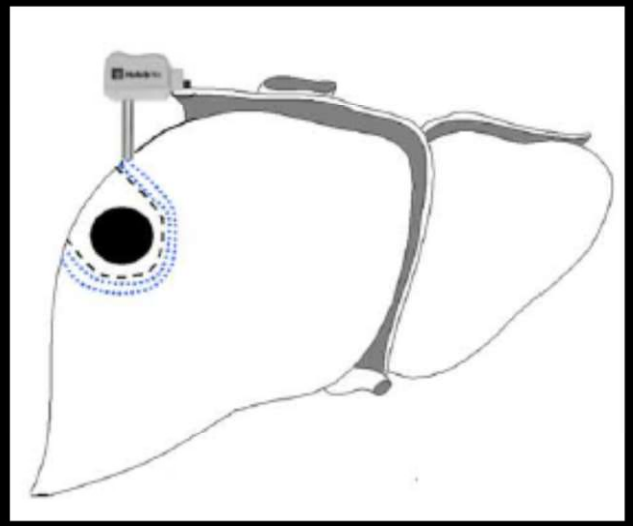


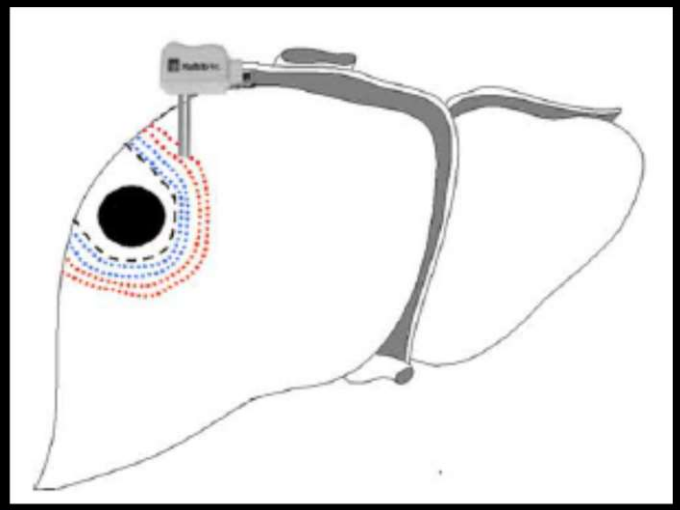

ANGIODYNAMICS
RITA Model 1500X
RF ON
HEATING TO TARGET TEMP
97
110
110
91
100
150
149
105
8.0
2.7
10
RF ON/OFF
TRACK ABLATION ON/OFF

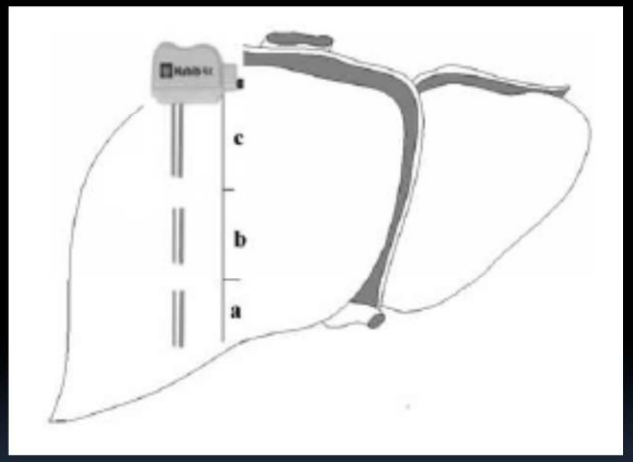
Sistema Habib 4x

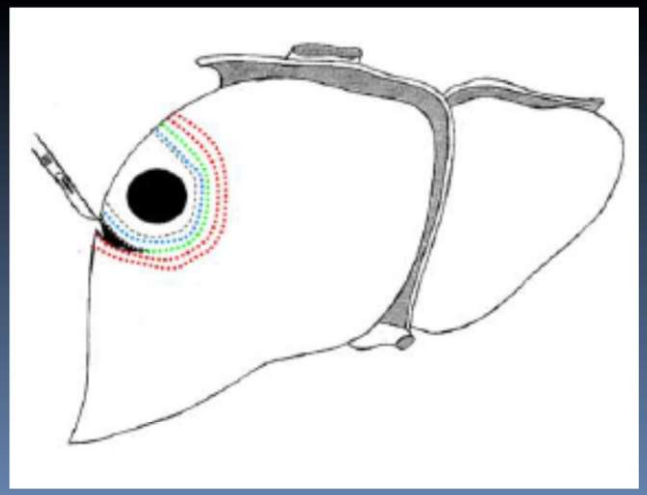

ANGIODYNAMICS
RITA Model 1500X
RF ON TEMP CONTROL
HEATING TO TARGET TEMP
97
110
110
91
100
150
149
105
8.0
2.7
10
CONTROL MODE
SET TEMP (C)
TIMER (min:s)
RF TIME (min:s)
EFFICIENCY 0-10
RF ON/OFF
TRACK ABLATION ON/OFF
FOOT PEDAL



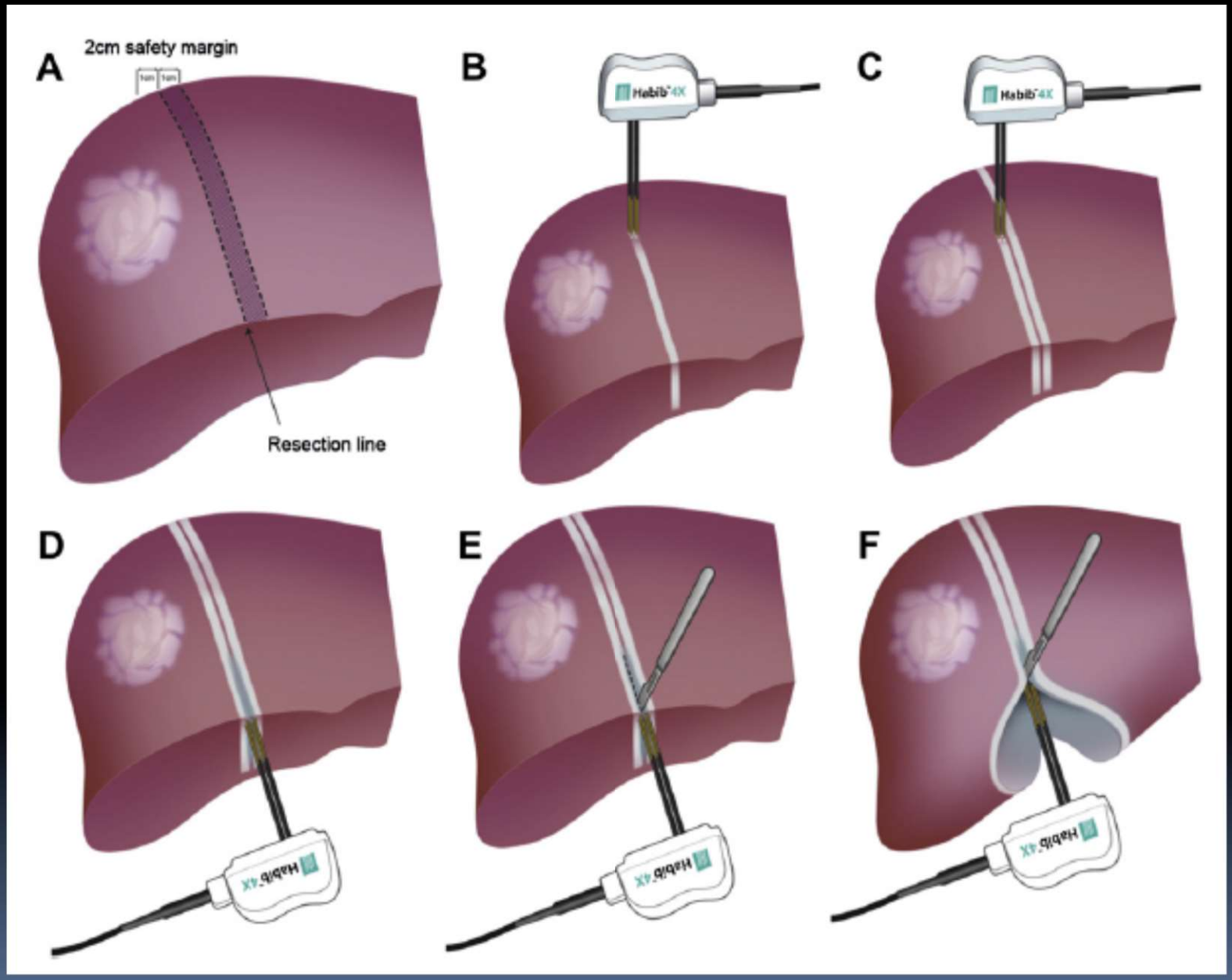


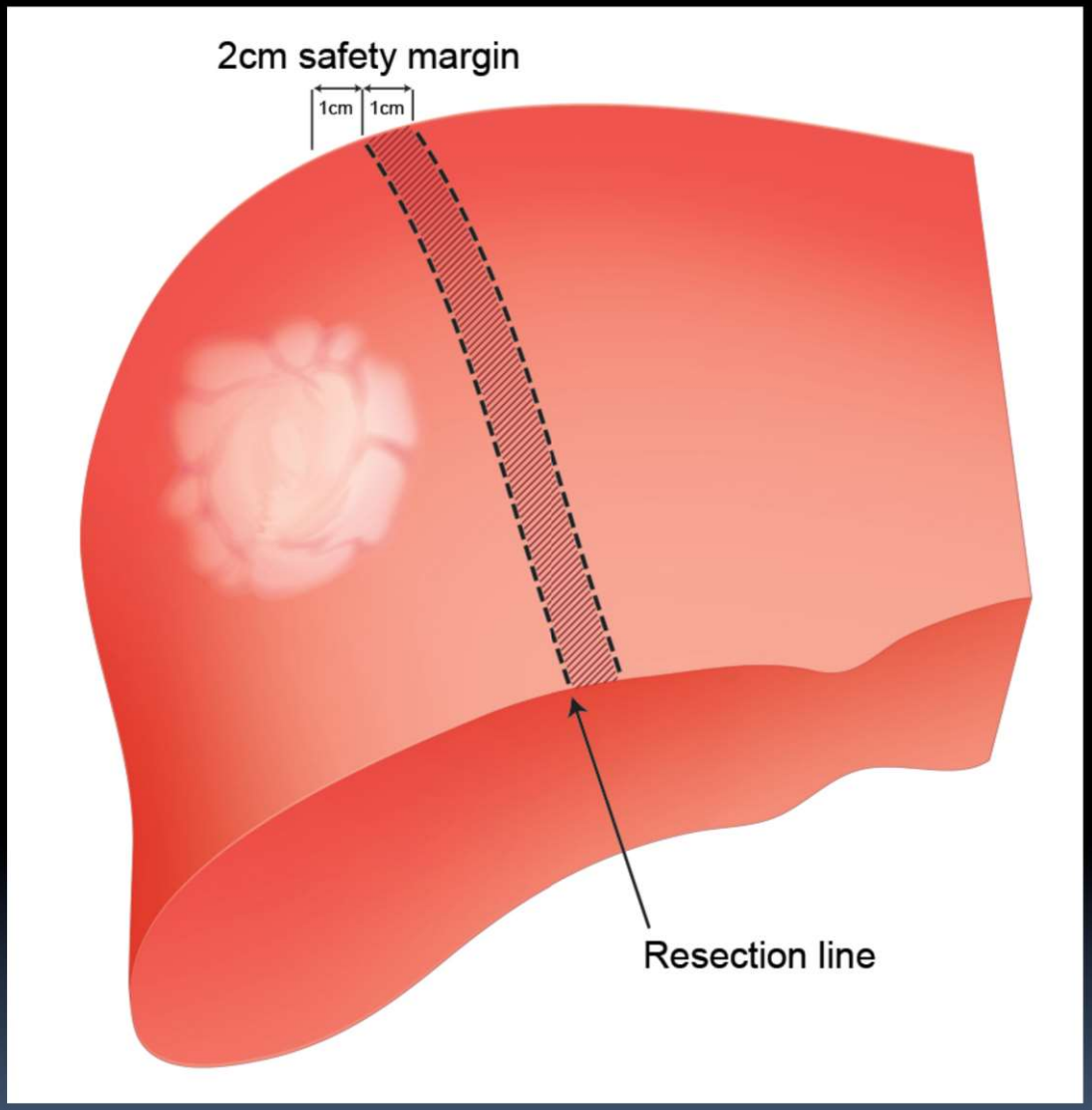


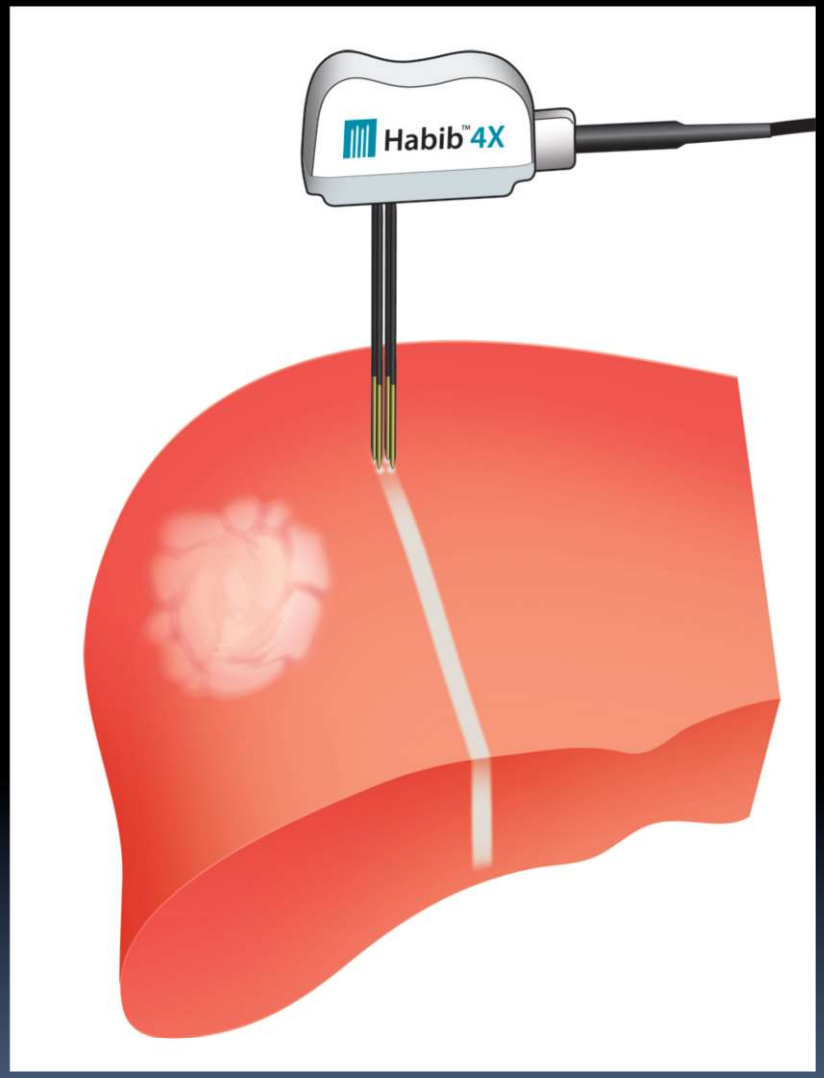


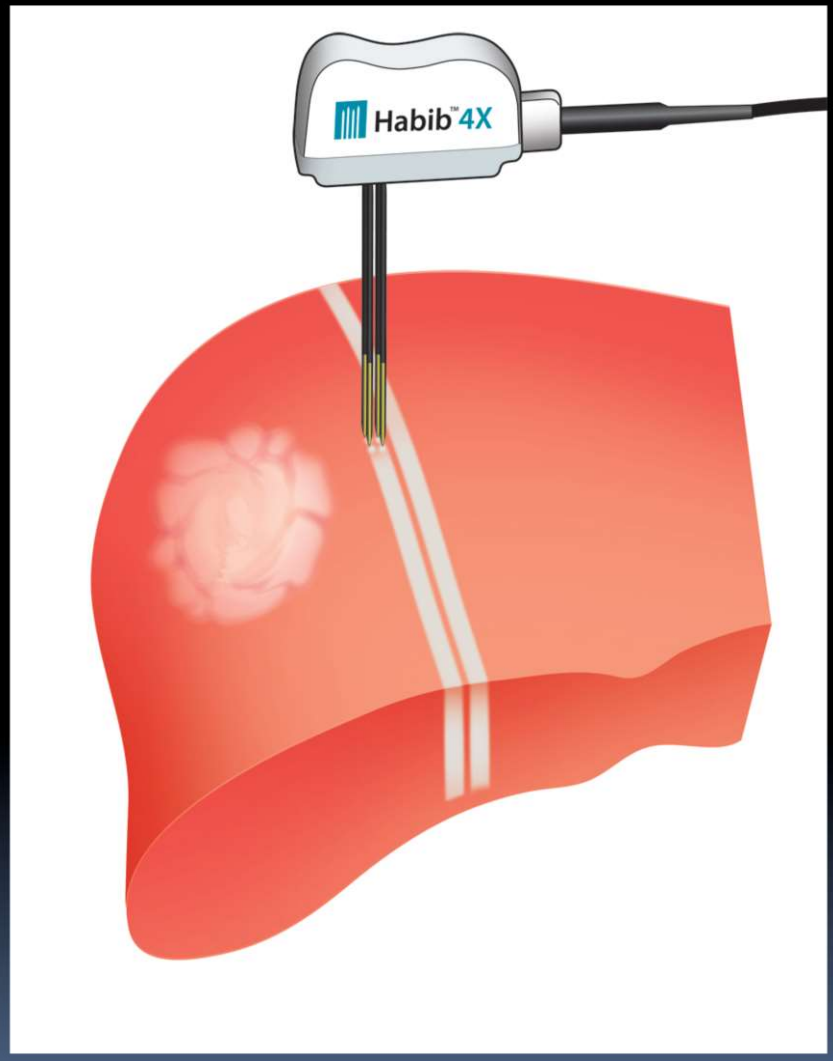


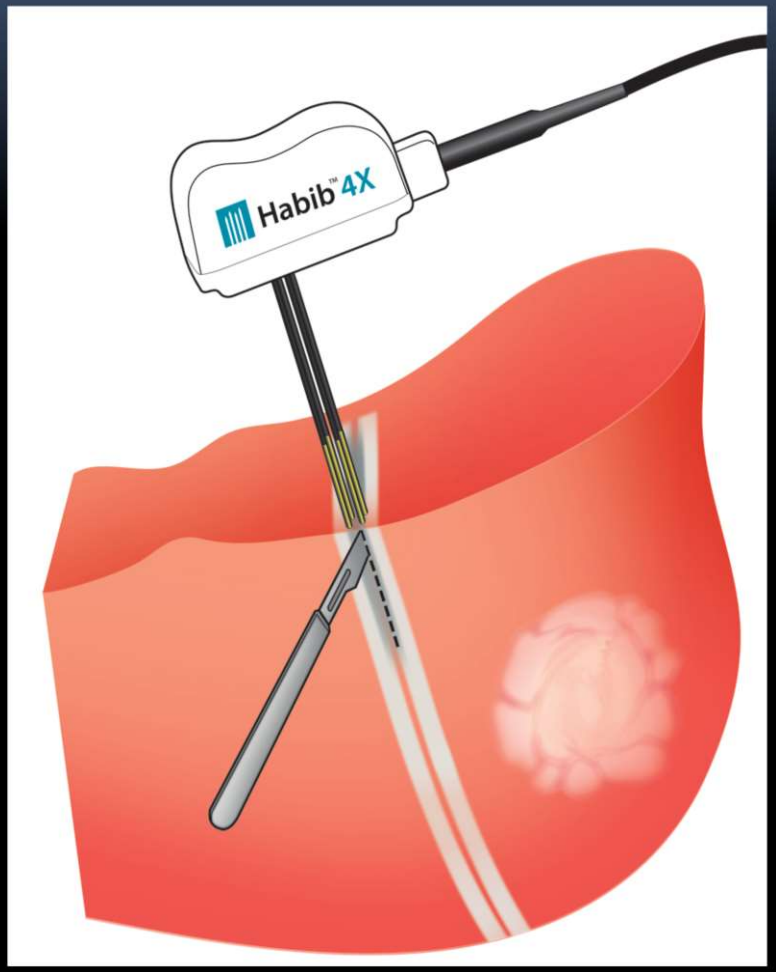
Periphery of the tumour marked with argon diathermy
Inner line of RF ablation
Outer line of RF ablation
Resection line

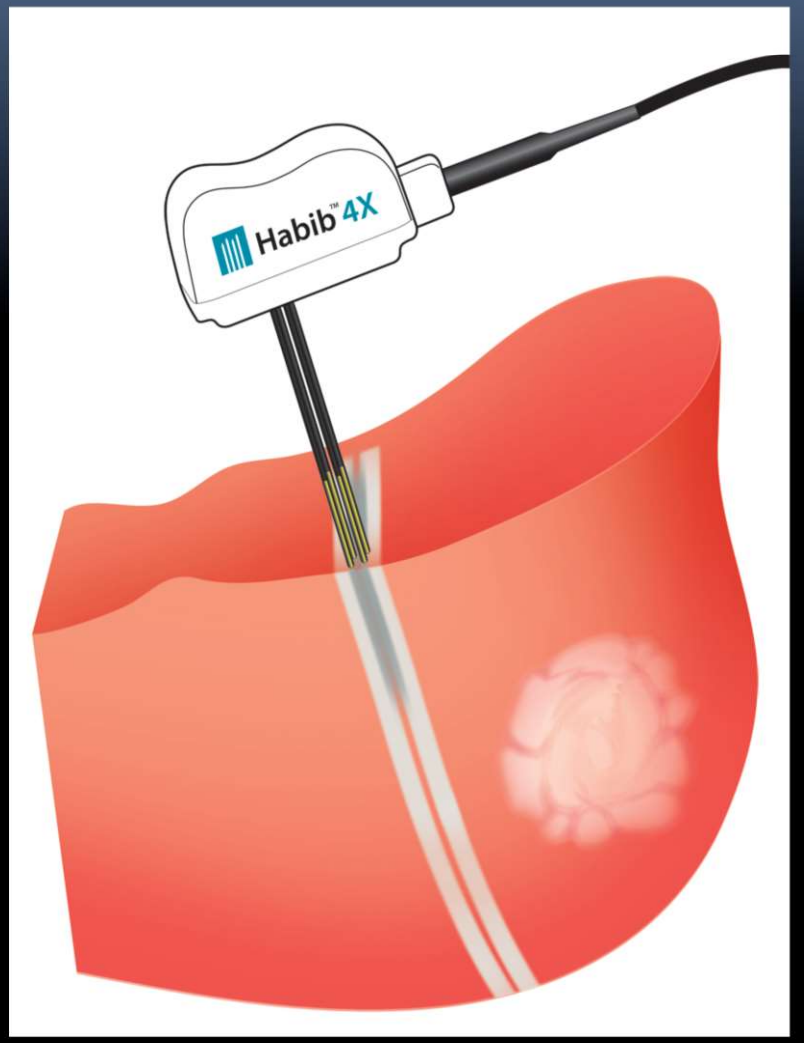

A
2cm safety margin
1cm
1cm
Resection line
B
Habib 4X
C
Habib 4X
D
Habib 4X
E
Habib 4X
F
Habib 4X

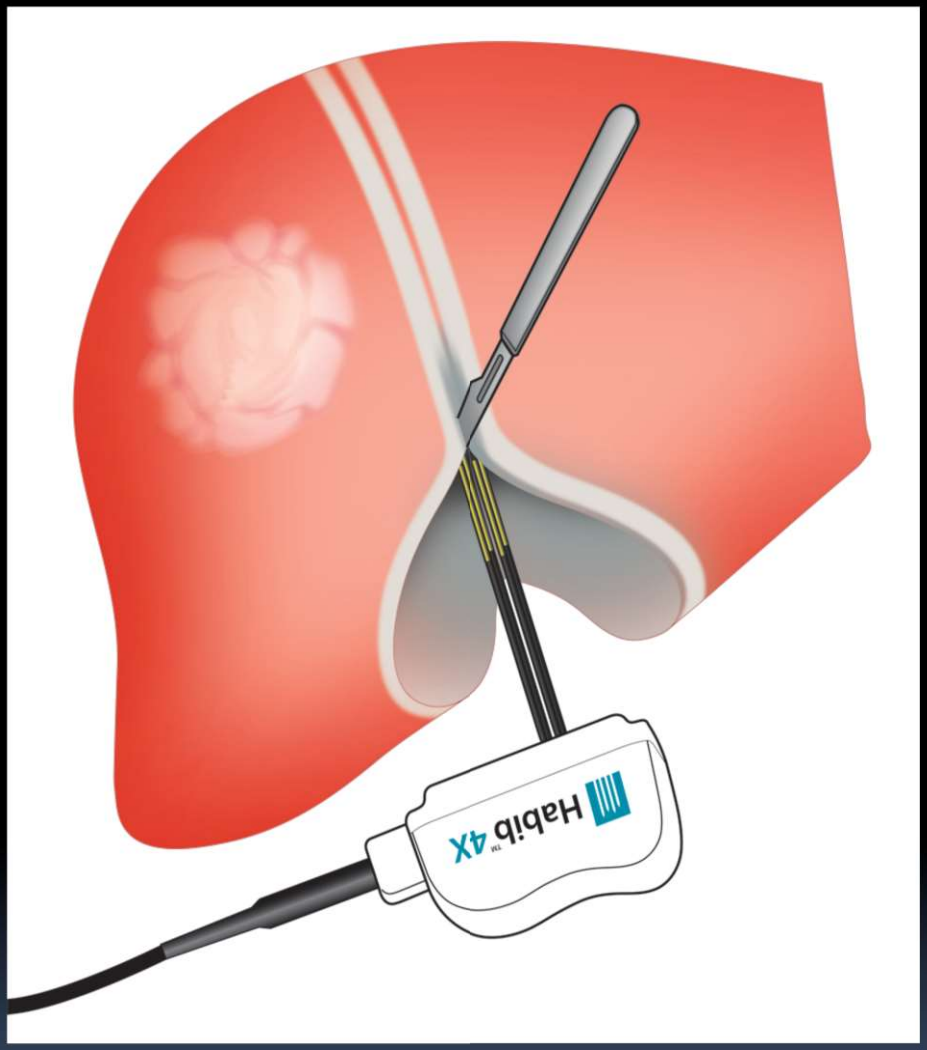

2cm safety margin
1cm
1cm
Resection line

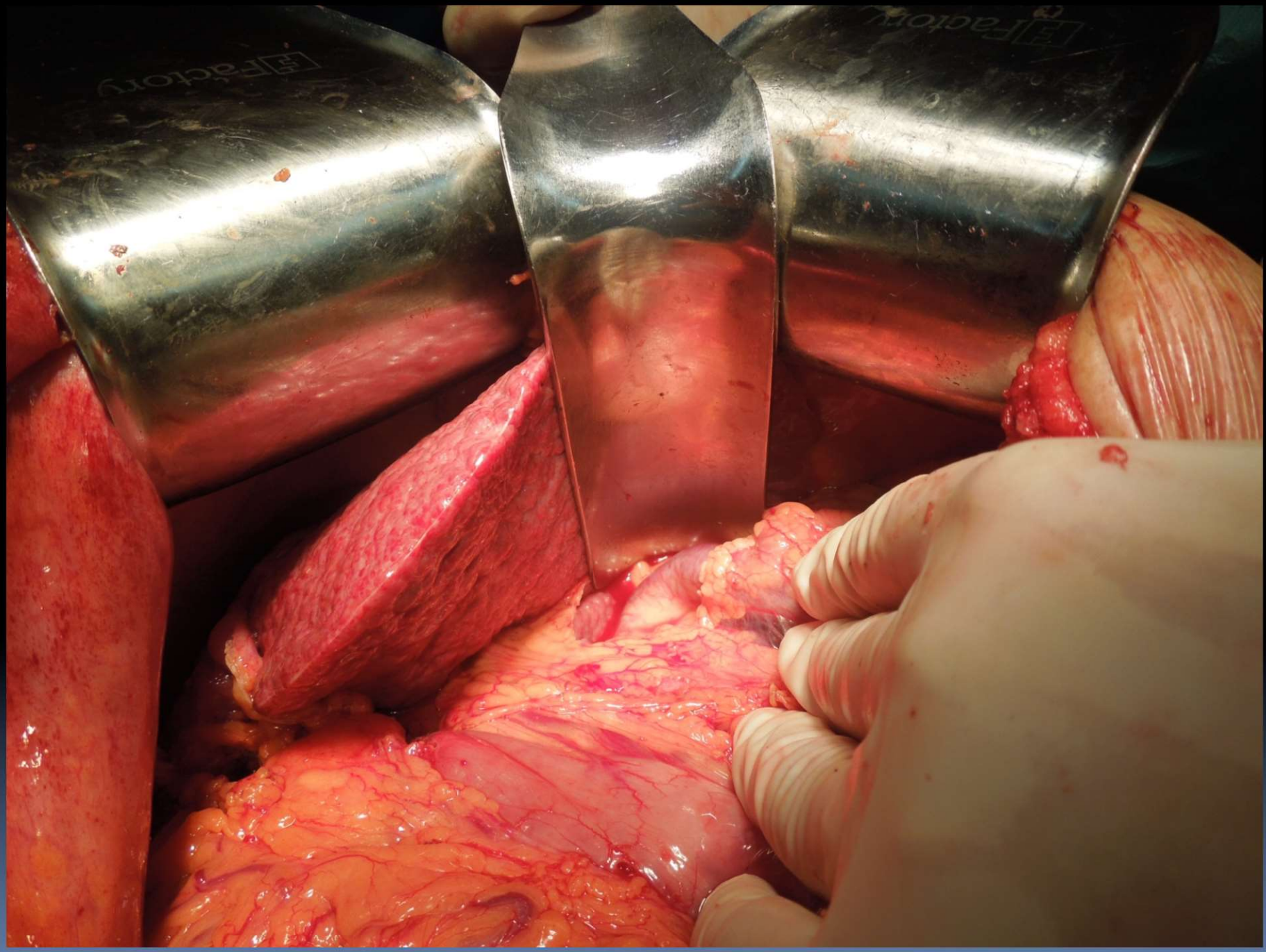

Habib™4X


Habib™4X

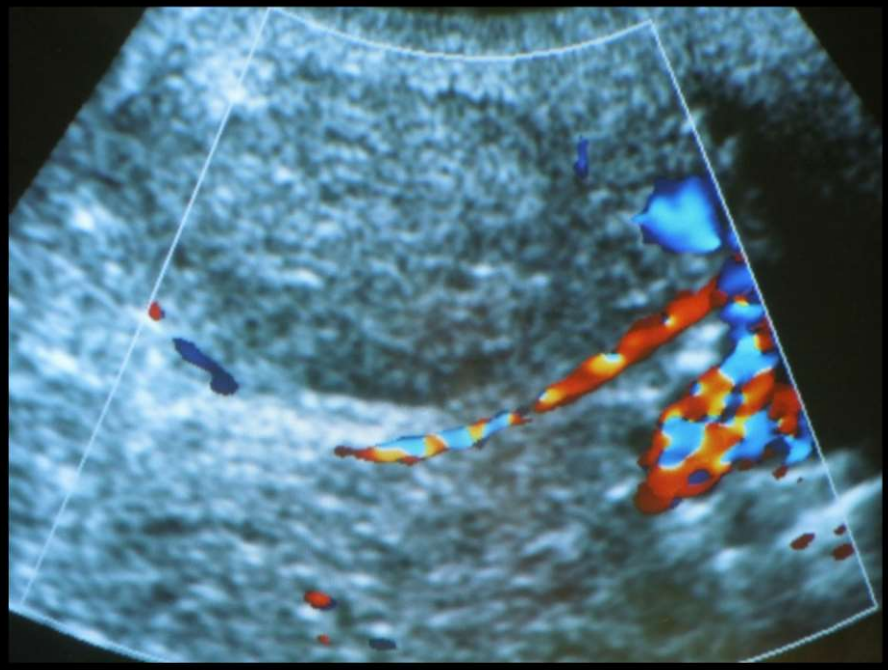

Habib™ 4X


Habib™ 4X


Habib 4X

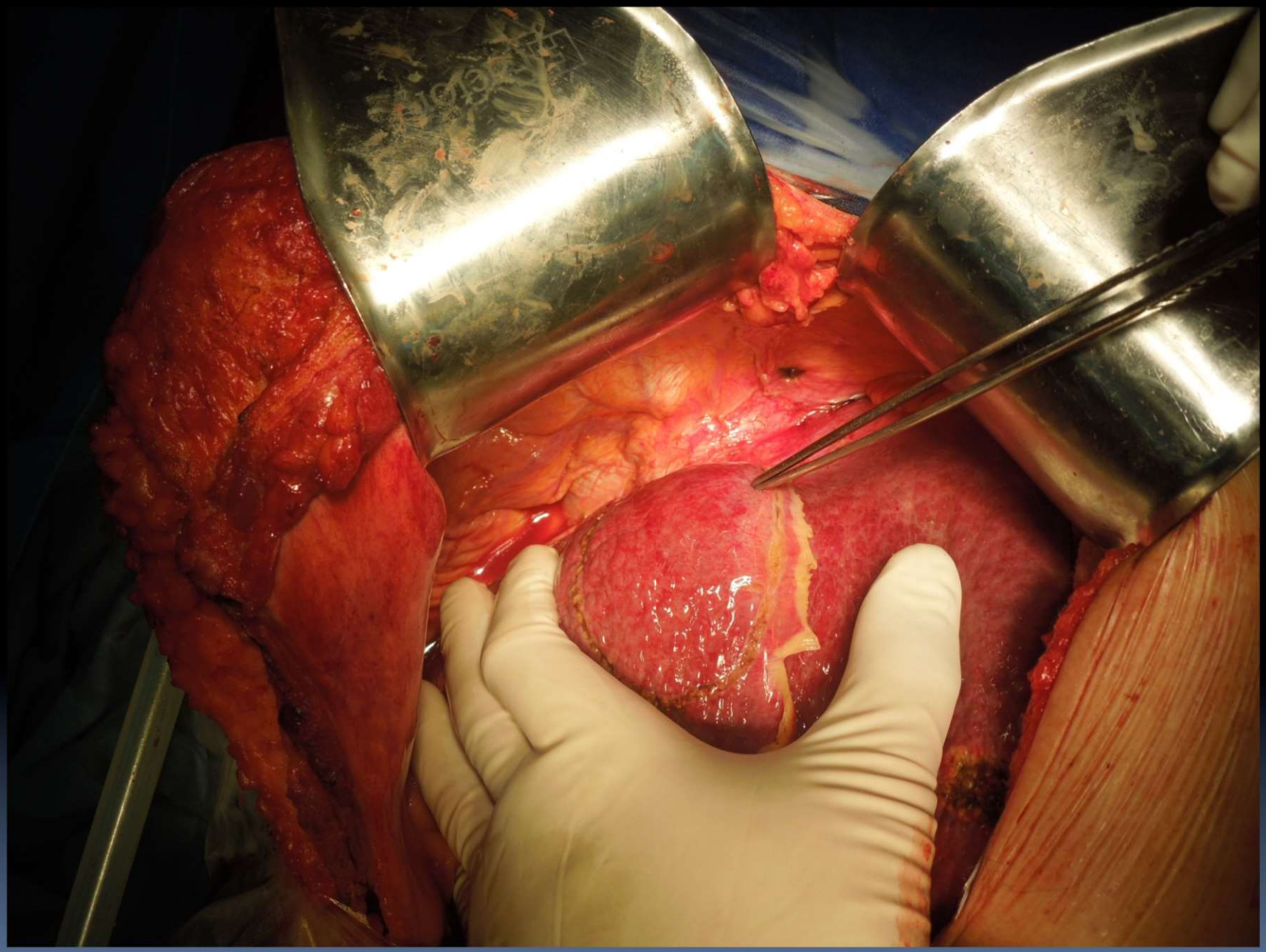


US intra-operatório

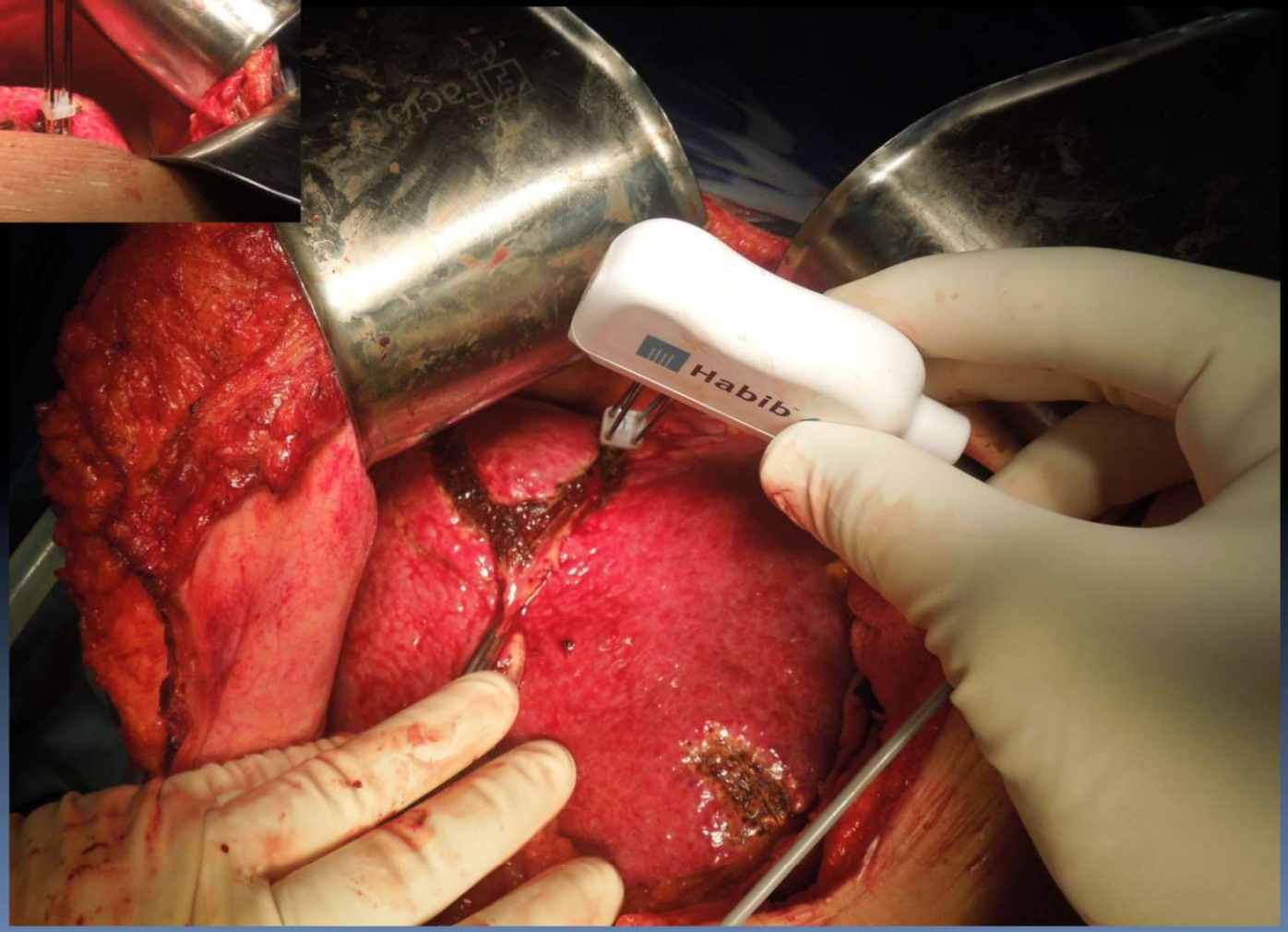


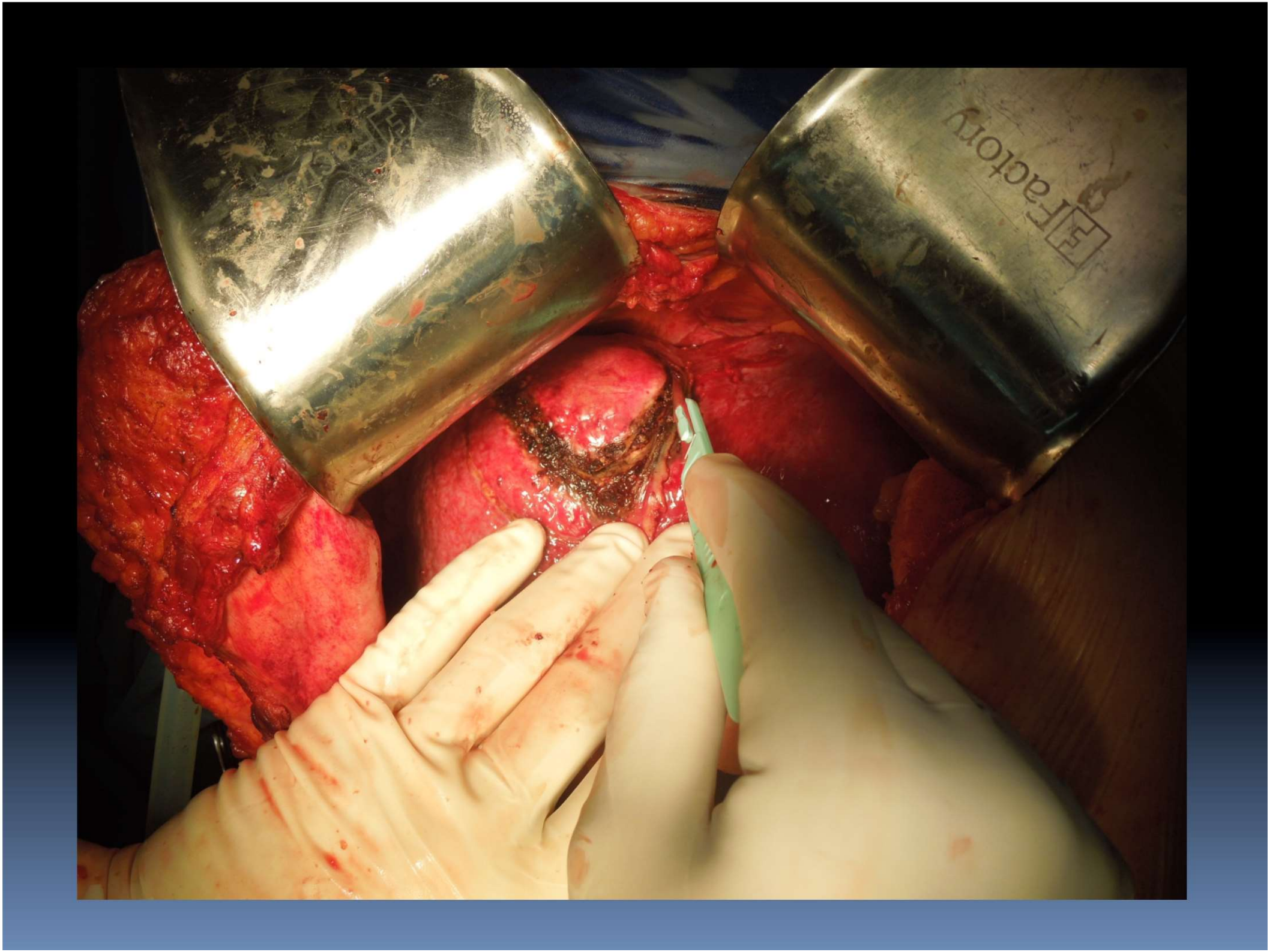
- Localização da lesão
- Avaliação de profundidade.
- Relação com a v. hepática média
- Demarcação prévia


PHILIPS




Habib 4X


Habib


Factory

Pontos importantes

- As agulhas são usadas como guia para evitar desvio da linha de ressecção.
- Não seccionar além da linha das agulhas.
- Manter as agulhas paralelas uma da outra.
- Para lesões profundas, o probe deve ser guiado pelo cirurgião para proteger a veia cava.

Available online at www.sciencedirect.com

SciVerse ScienceDirect

EJSO 38 (2012) 274–280

EJSO
the Journal of Cancer Surgery

www.ejso.com

Radiofrequency assisted liver resection: Analysis of 604 consecutive cases

M. Pai, A.E. Frampton, S. Mikhail, V. Resende, O. Kornasiewicz, D.R. Spalding, L.R. Jiao, N.A. Habib*

HPB Surgical Unit, Department of Surgery and Cancer, Imperial College, Hammersmith Hospital Campus, Du Cane Road, London W12 0HS, UK

Accepted 12 December 2011
Available online 30 December 2011

Abstract

Background: Intraoperative blood loss is an important factor contributing to morbidity and mortality in liver surgery. To address this we developed a bipolar radiofrequency (RF) device, the Habib 4X, used specifically for hepatic parenchymal transection. The aim of this study was to prospectively assess the peri-operative data using this technique.

Methods: Between 2001 and 2010, 604 consecutive patients underwent liver resections with the RF assisted technique. Clinico-pathological and outcome data were collected and analysed.

Results: There were 206 major and 398 minor hepatectomies. Median intraoperative blood loss was 155 (range 0–4300) ml, with a 12.6% rate of transfusion. There were 142 patients (23.5%) with postoperative complications; none had bleeding from the resection margin. Only one patient developed liver failure and the mortality rate was 1.8%.

Conclusions: RF assisted liver resection allows major and minor hepatectomies to be performed with minimal blood loss, low blood transfusion requirements, and reduced mortality and morbidity rates.

Table 1
Patient and tumour characteristics of the study cohort.

Characteristic	Finding
Age (median, range, years)	60 (21 - 89)
Sex, No., M:F	306:298
Diagnosis, No. (%)	
Metastases	448 (74.2)
Colorectal	340 (56.3)
Neuroendocrine	21 (3.5)
GIST	19 (3.1)
Ovarian	16 (2.7)
Breast	12 (2.0)
Others	40 (6.6)
Hepatocellular carcinoma	45 (7.5)
Cholangiocarcinoma	40 (6.6)
Gallbladder carcinoma	17 (2.8)
Benign	54 (8.9)

Abbreviation: GIST, gastrointestinal stromal tumour.

treated conservatively, 10 required endoscopic retrograde cholangiopancreatography (ERCP) and stenting, 4 had

Table 2
Types of hepatic resection performed.

Resections	No. (%)
Major liver resections	*206/604 (34.1%)*
Right hepatectomy	118
Left hepatectomy	37
Extended right/left hepatectomy	13
Three or more segmentectomies	38
Minor liver resections	*398/604 (65.9%)*
One or two segmentectomies	325
Wedge resections	73

Table 3
Postoperative morbidity and mortality following hepatic resection.

Post-operative outcome	
ITU Admission, No. (%)	26 (4.3)
Blood loss, median (range) mL	155 (0 – 4300)
Blood transfusion, No. (%)	76 (12.6)
Morbidities	
Symptomatic collection, No. (%)	69 (11.4)
Bile leak, No. (%)	25 (4.1)
Transient liver insufficiency, No. (%)	7 (1.2)
Pleural effusion needing intervention, No. (%)	17 (2.8)
Thoracic empyema, No. (%)	2 (0.3)
Hospital acquired pneumonia, No. (%)	11 (1.8)
30-Day mortality, No. (%)	11 (1.8)

Adenoma hepatocelular

Table 4
Patient characteristics and postoperative outcomes of our cohort compared to large published series. NA, not available.

Author	Technique	No. of resections	Minor	Major	Pringle	Collection/ abscess	Bile leak	Blood loss (median)	Transfusion	ITU/HDU admission	30-Day mortality
Belghiti et al. (2000)[15]	Ultrasonic Dissector	747	414 (55.4%)	333 (44.6%)	541 (72.4%)	NA	NA	NA	NA	NA	33 (4.4%)
		478 (normal liver)	214 (55.2%)	214 (44.8%)	NA	34 (7.1%)	NA	NA	112 (23%)	NA	5 (1%)
Jarnagin et al. (2002)[1]	Clamp crush	1803	690 (38%)	1113 (62%)	Majority	207 (11.5%)	47 (2.6%)	600 ml (mean 871 ± 24 ml)	880 (49%)	112 (6%)	55 (3.1%)
Imamura et al. (2003)[16]	Clamp crush/ Ultrasonic Dissector	1056	NA	NA	Majority	103 (9.7%)	97 (9.2%)	NA	NA	NA	0
		755 (normal liver)									
Poon et al. (2004)[28]	Finger fracture (1989–1992)	1222	467 (38.2%)	755 (61.8%)	406 (30%)	33 (2.7%)	38 (3.1%)	1450 ml (850–2950 ml) (1989–1996)	414 (33.9%)	NA	39 (3.2%)
	Ultrasonic Dissector (1992–2003)	824 (normal liver)						750 ml (10–1450 ml) (1996–2003)			
Ercolani et al. (2008)[17]	Clamp crush/ Ultrasonic Dissector	1260	867 (68.8%)	393 (31.2%)	594 (47.1%)	NA	NA	NA	496 (39.4%)	NA	45 (3.6%)
Feng et al. (2008)[29]	NA	827	370 (44.7%)	457 (55.3%)	NA	44 (5.3%)	10 (1.2%)		316 (38.2%)	NA	2 (0.24%)
Kyoden et al. (2009)[18]	Clamp crush	1269	972	297	Majority	65 (5.1%)	111 (8.7%)	655 ml (0–12,500 ml)	NA	NA	
Huang et al. (2009)[30]	Microwave Precoagulation in 236 patients	2008	1581 (78.7%)	427 (21.3%)	NA	34 (1.7%)	20 (1%)	NA	929 (46%)	NA	11 (0.5%)
Our data 2011	Habib 4X and Monopolar RF	604	398 (65.9%)	206 (34.1%)	2 (0.3%)	69 (11.4%)	25 (4.1%)	155 ml (0–4300 ml)	76 (12.6%)	26 (4.3%)	11 (1.8%)

Lençóis Maranhenses

www.drorlandotorres.com.br

Obrigado!