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Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy (ALPPS)

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HPB Surgeon

Introduction

- Major liver resections
- Future liver remnant ($> 0.5\%$)

Two stage hepatectomy

Portal vein occlusion:

a) Portal vein embolization

b) Portal vein ligation

Hypertrophy 20-35% in 45 days

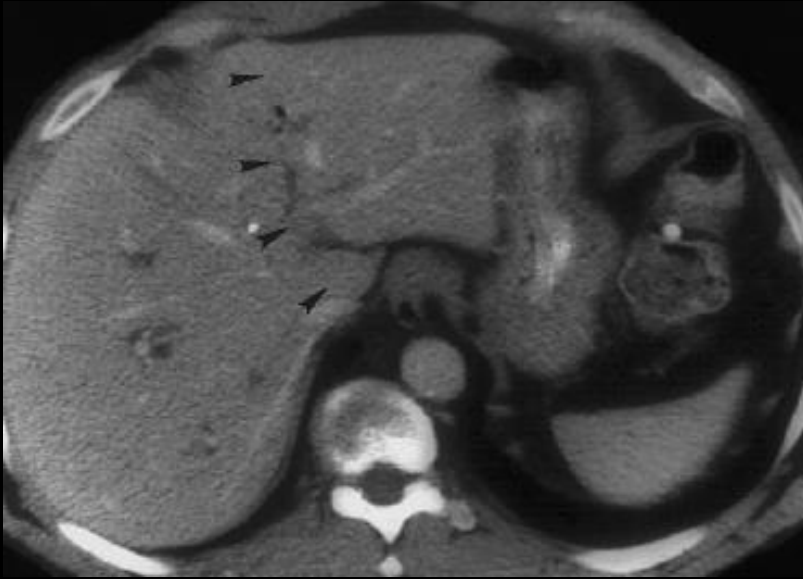
Portal vein embolization



After 4-6 weeks

35%

Portal Vein Embolization



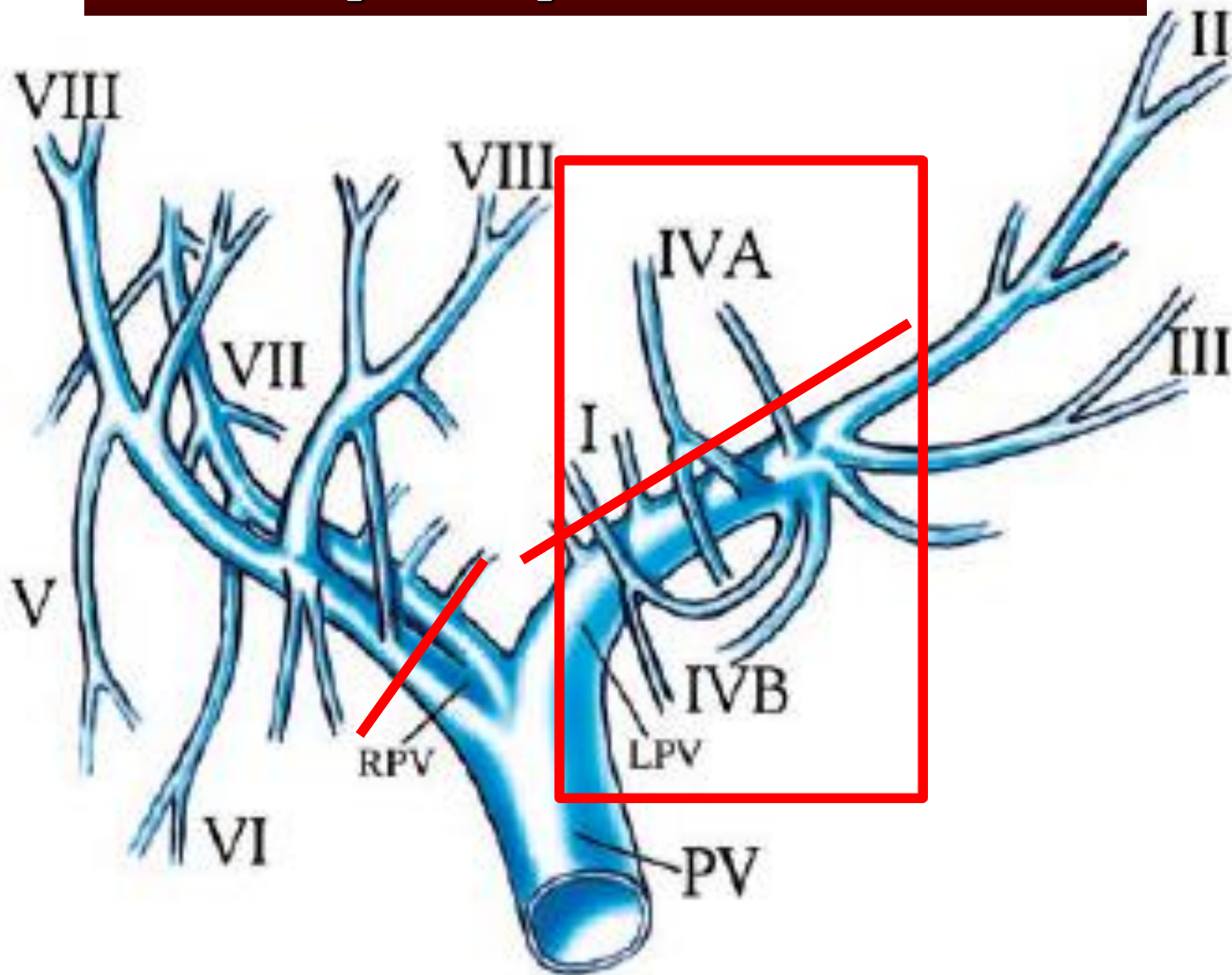
Before
301 cm³

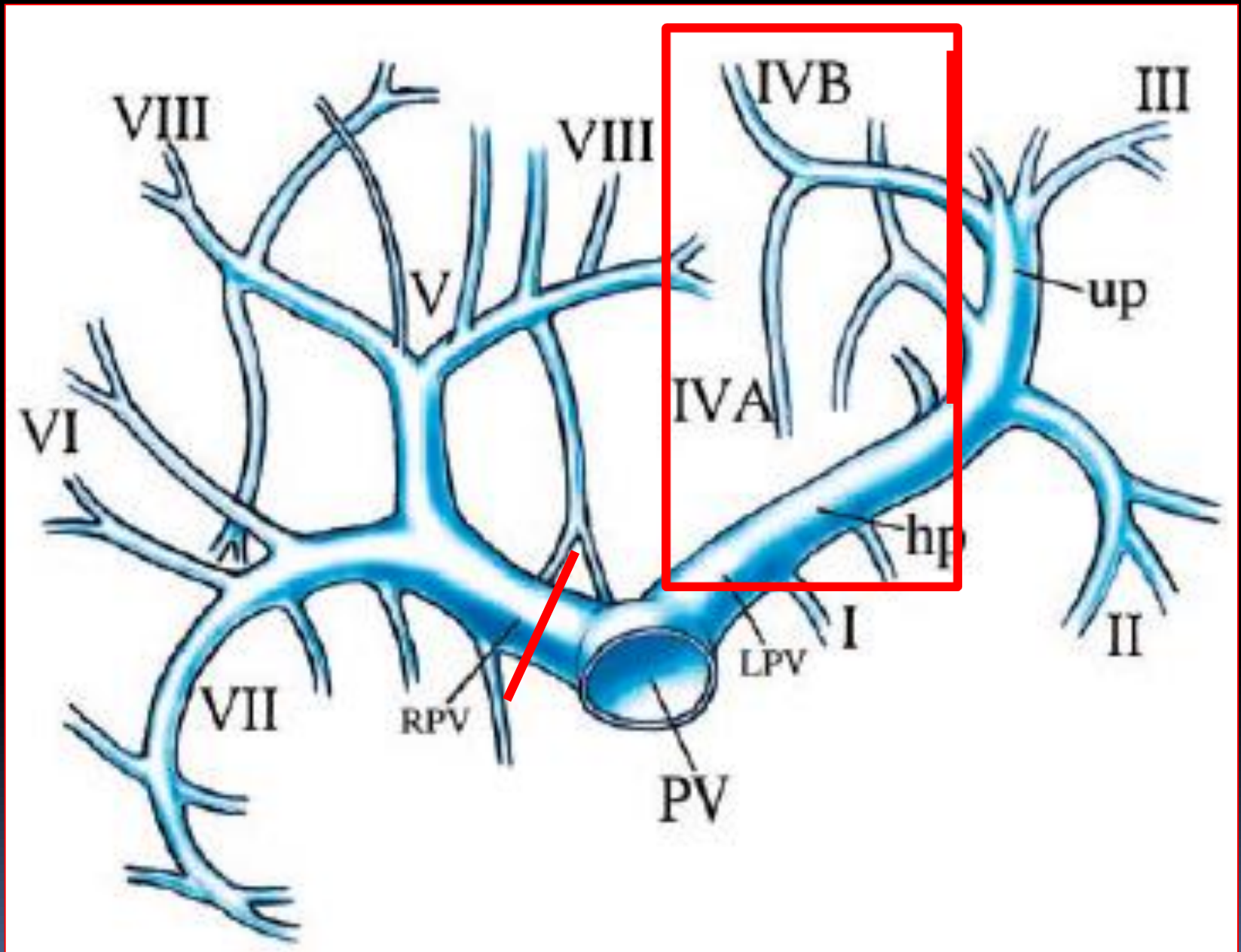
4-6 weeks

25.1%

After
463 cm³

Intrahepatic portal collaterals





Right Portal Vein Ligation Combined With In Situ Splitting Induces Rapid Left Lateral Liver Lobe Hypertrophy Enabling 2-Stage 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**

ALPPS in Germany

- 25 patients (five universities)

Colorectal metastasis	14
Others	11
- Two steps procedure PVL and ISS
- Hypertrophy from 21-192% (74%)
- Nine days

ALPPS in Argentina

World J Surg (2012) 36:125–128
DOI 10.1007/s00268-011-1331-0



How to Avoid Postoperative Liver Failure: A Novel Method

Eduardo de Santibañes · Fernando A. Alvarez ·
Victoria Ardiles

- Three patients
 - Two colorectal metastasis
 - One Hilar Cholangiocarcinoma
- Hypertrophy from 40–83%
- After six days

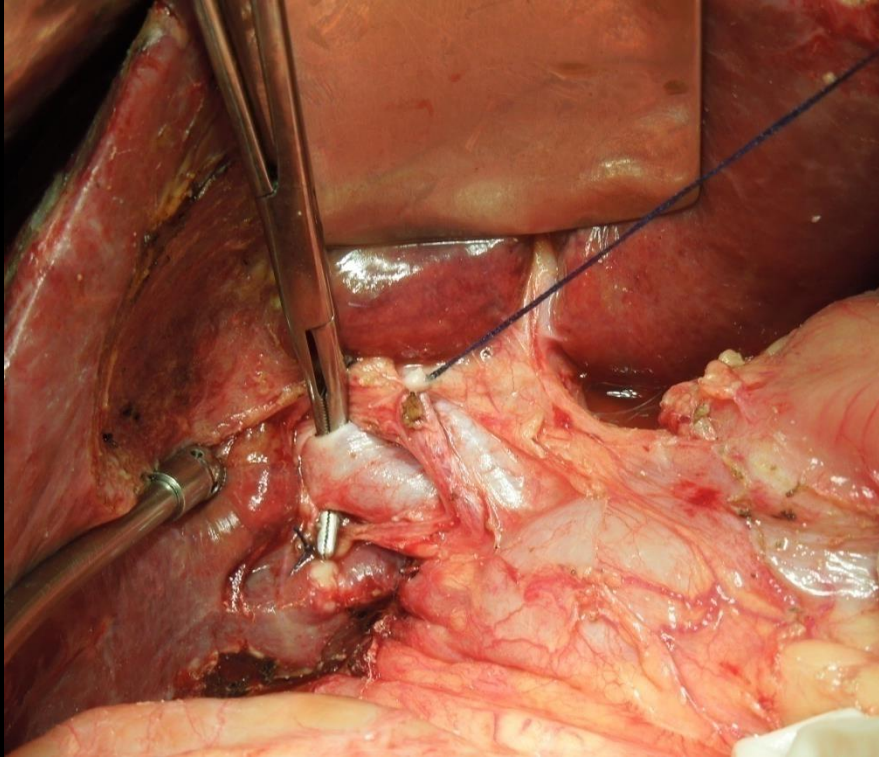
de Santibanes E, et al. World J Surg 2012;36:125-8



ALPPS: Brazilian Experience

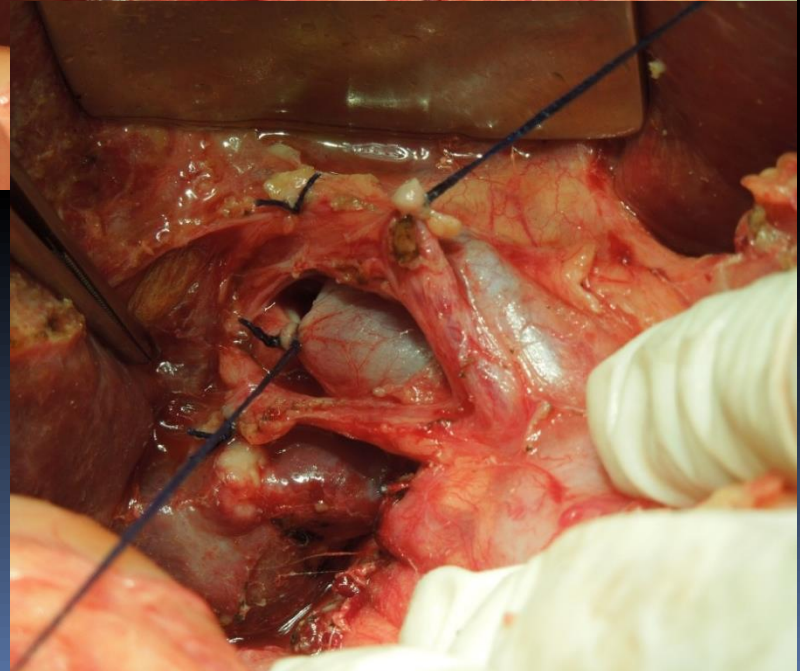
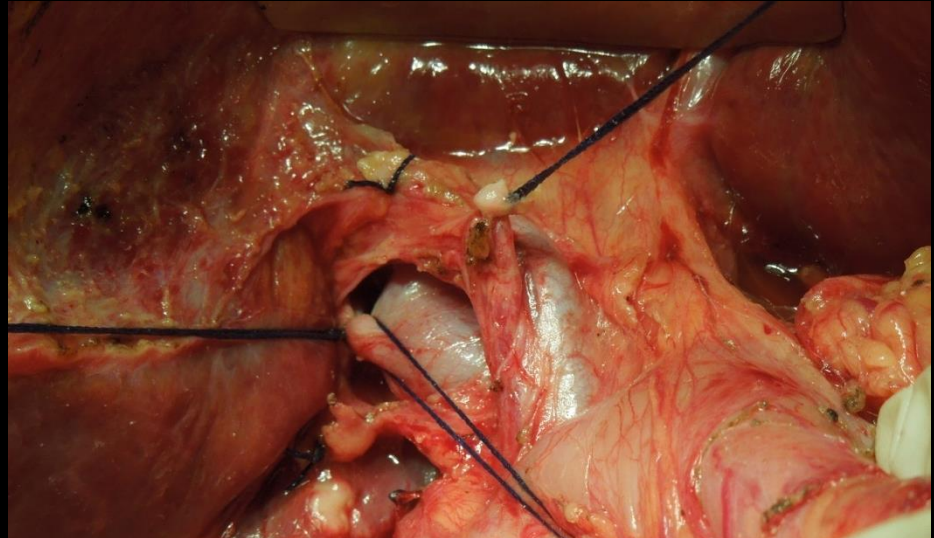


Technique

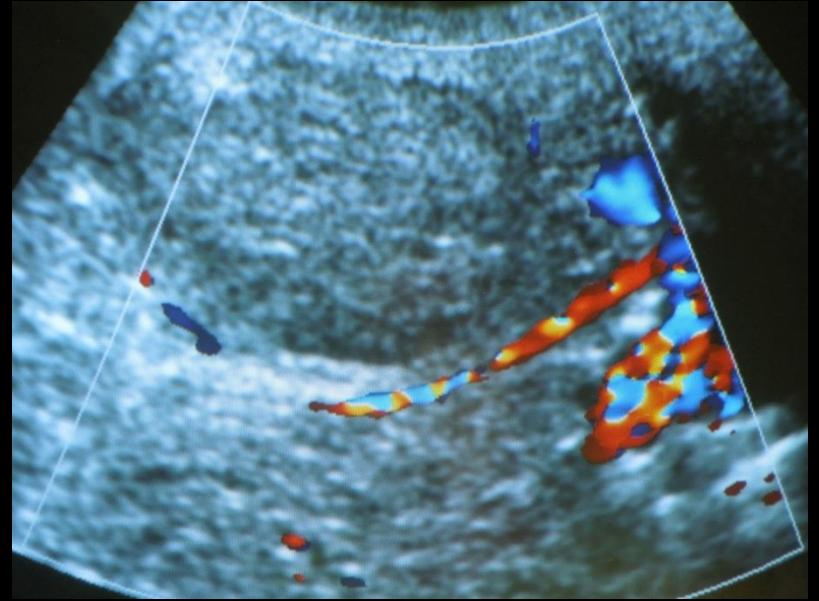


First operation

Right Portal Vein Ligation

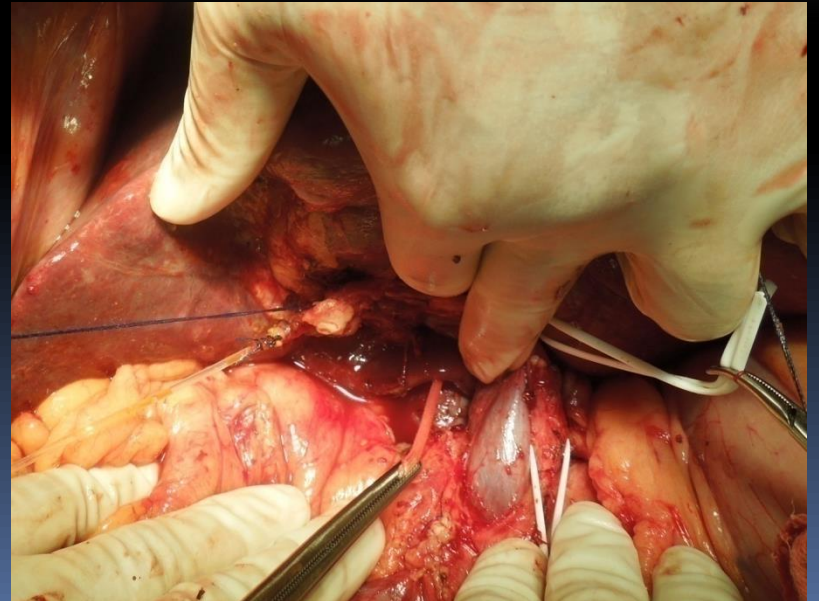
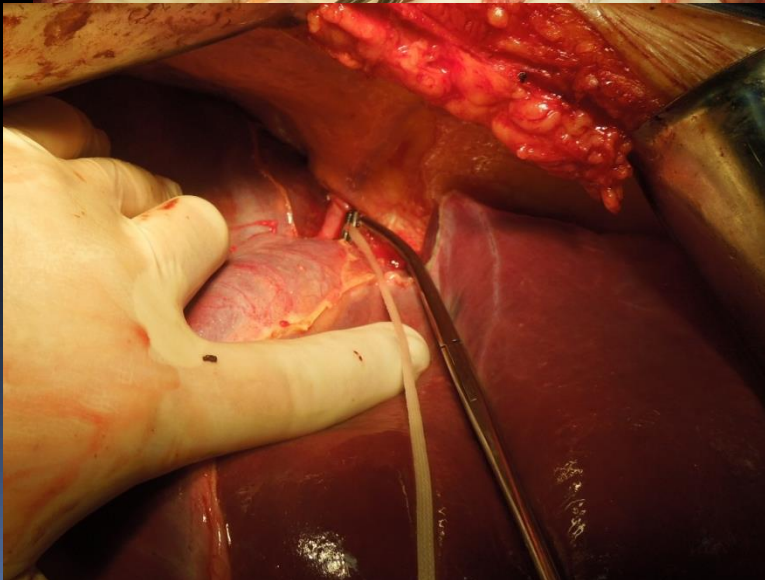
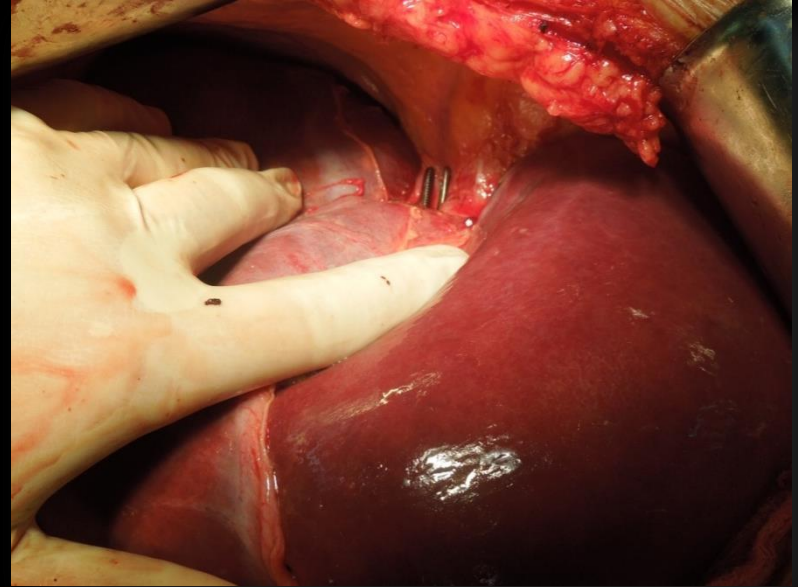
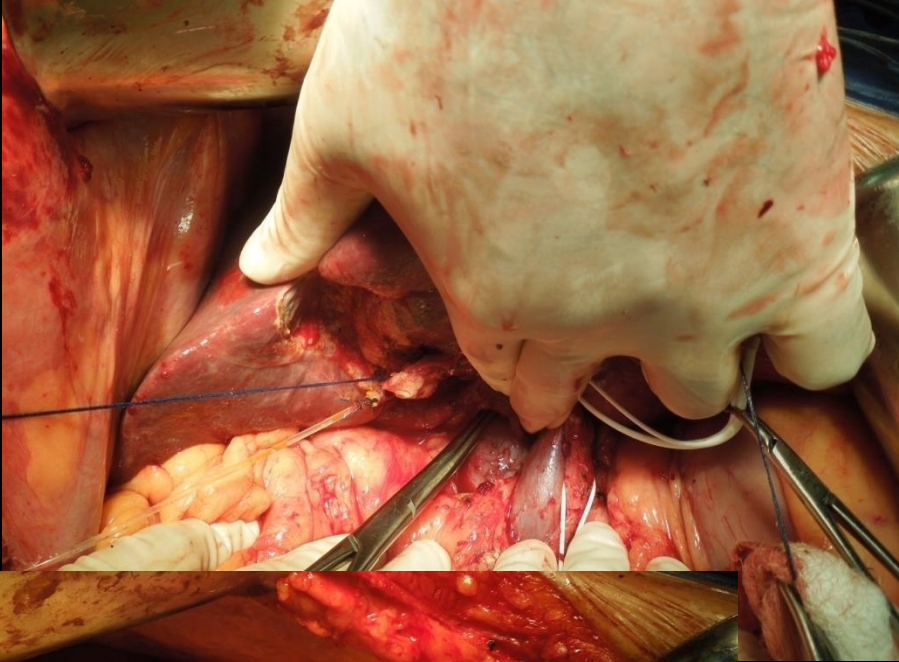


Intraoperative US



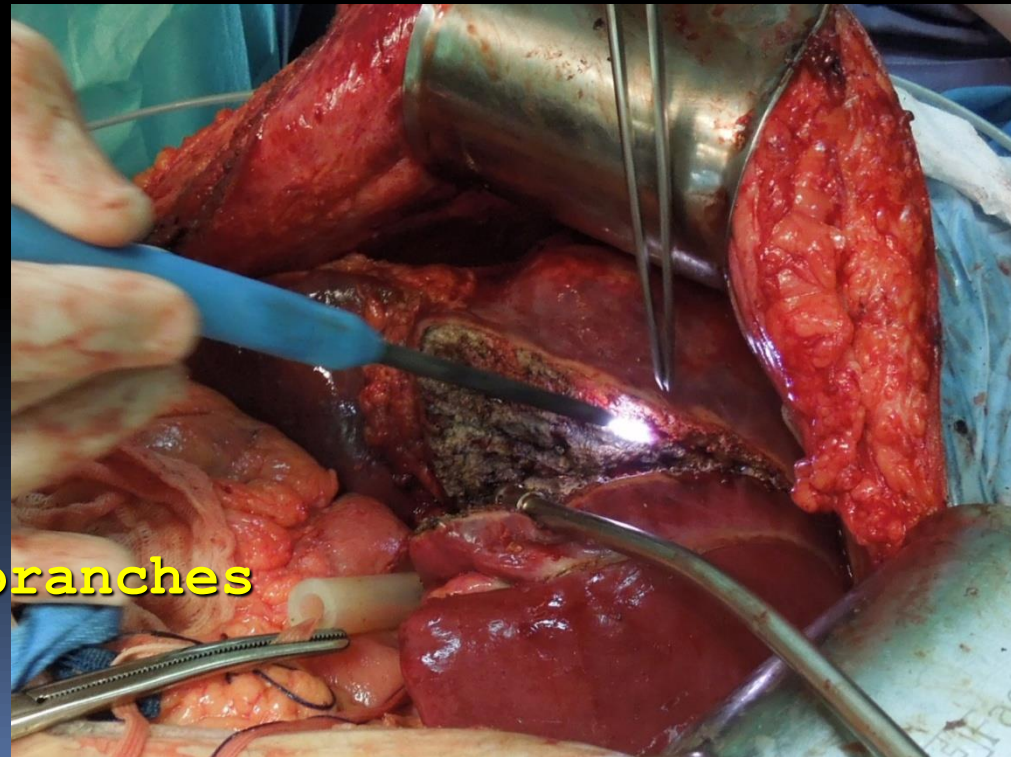
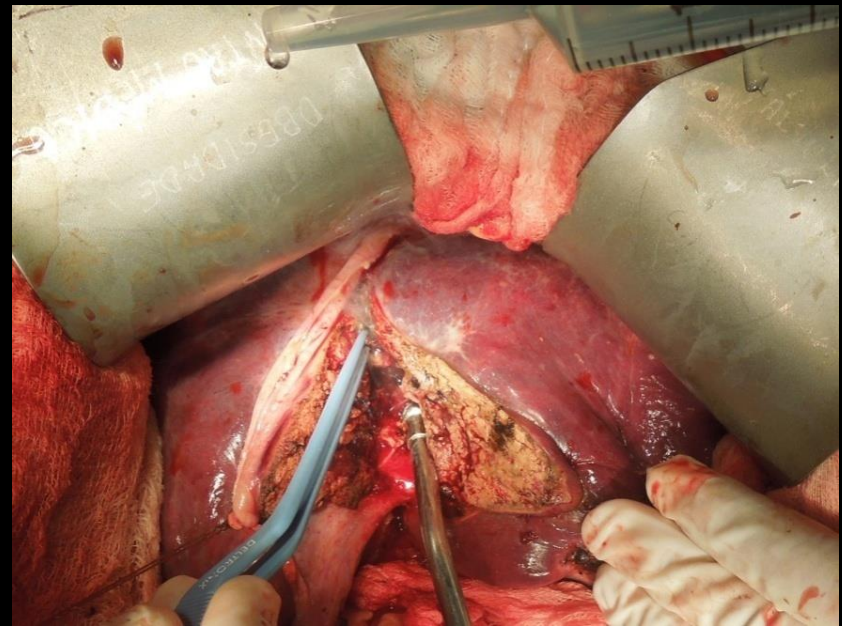
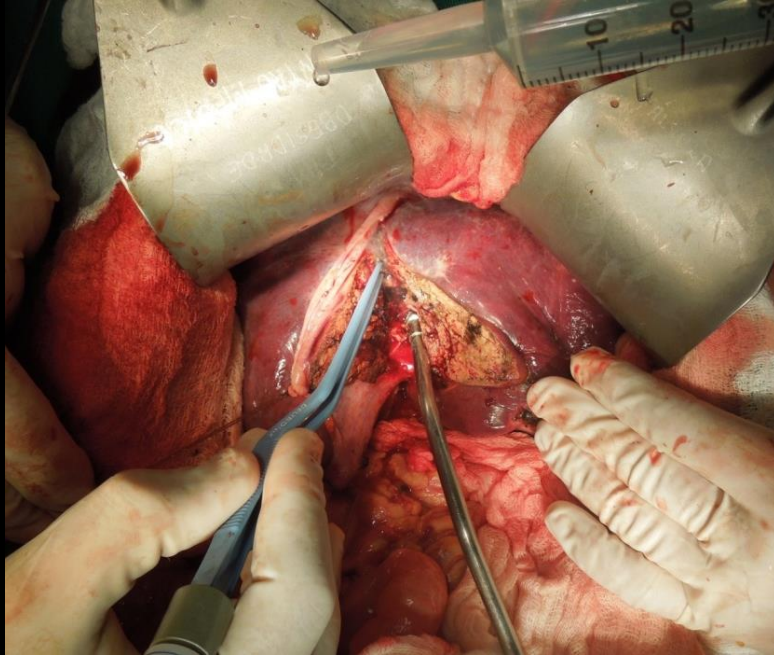
ALPPS

In situ liver transection

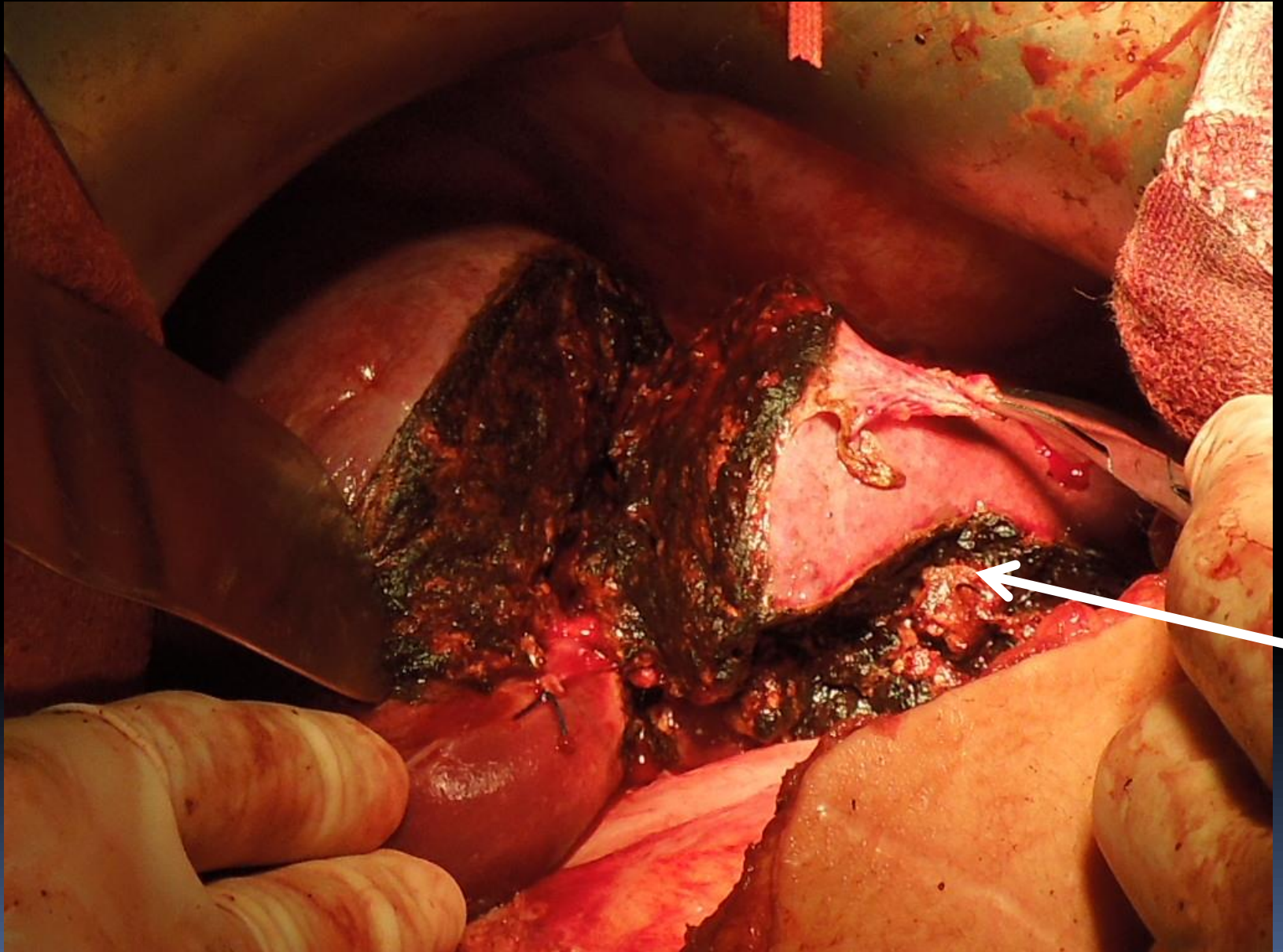


ALPPS

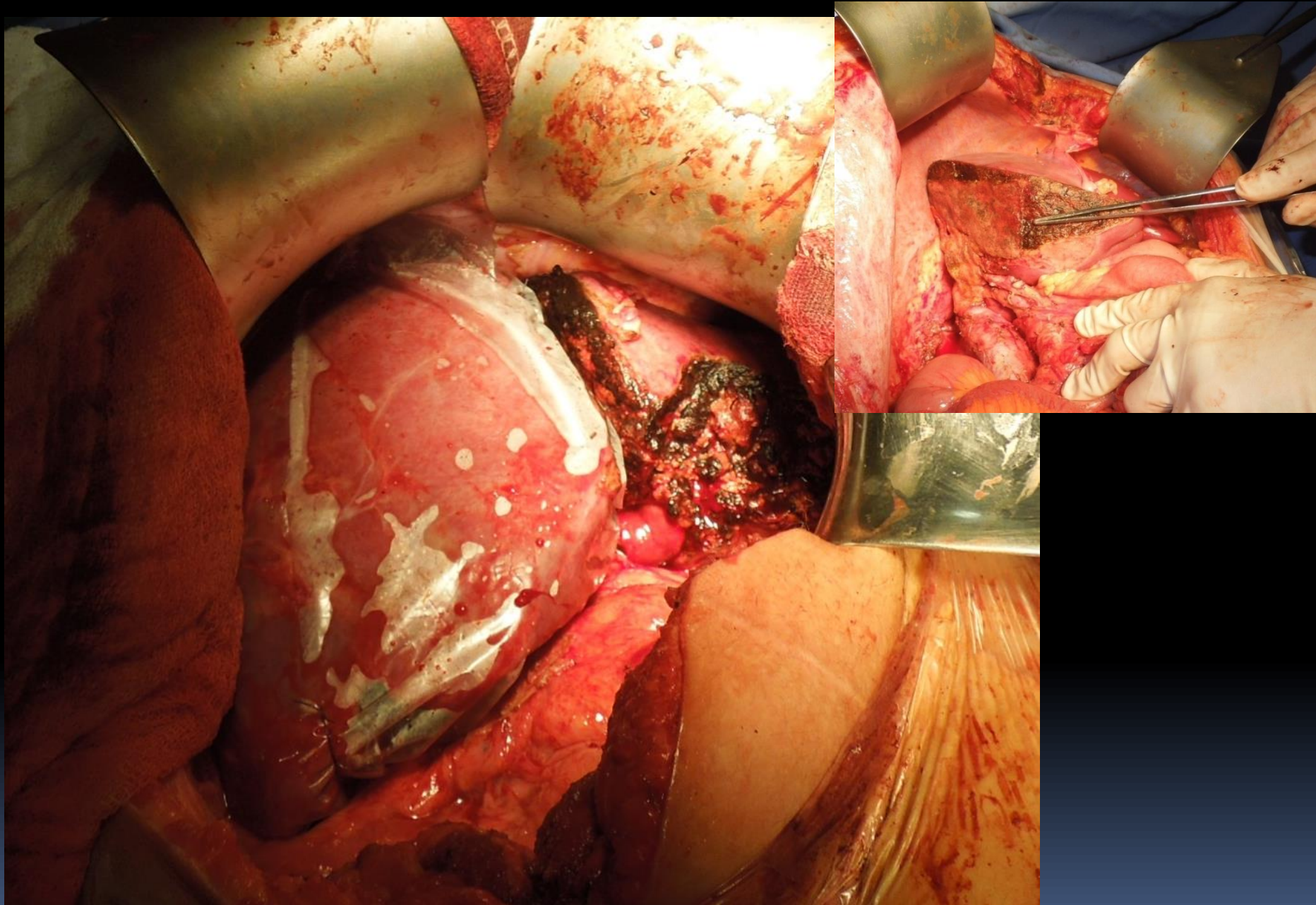
In situ liver transection



Ligation of segment IV branches



Resections of small lesions in segment II/III

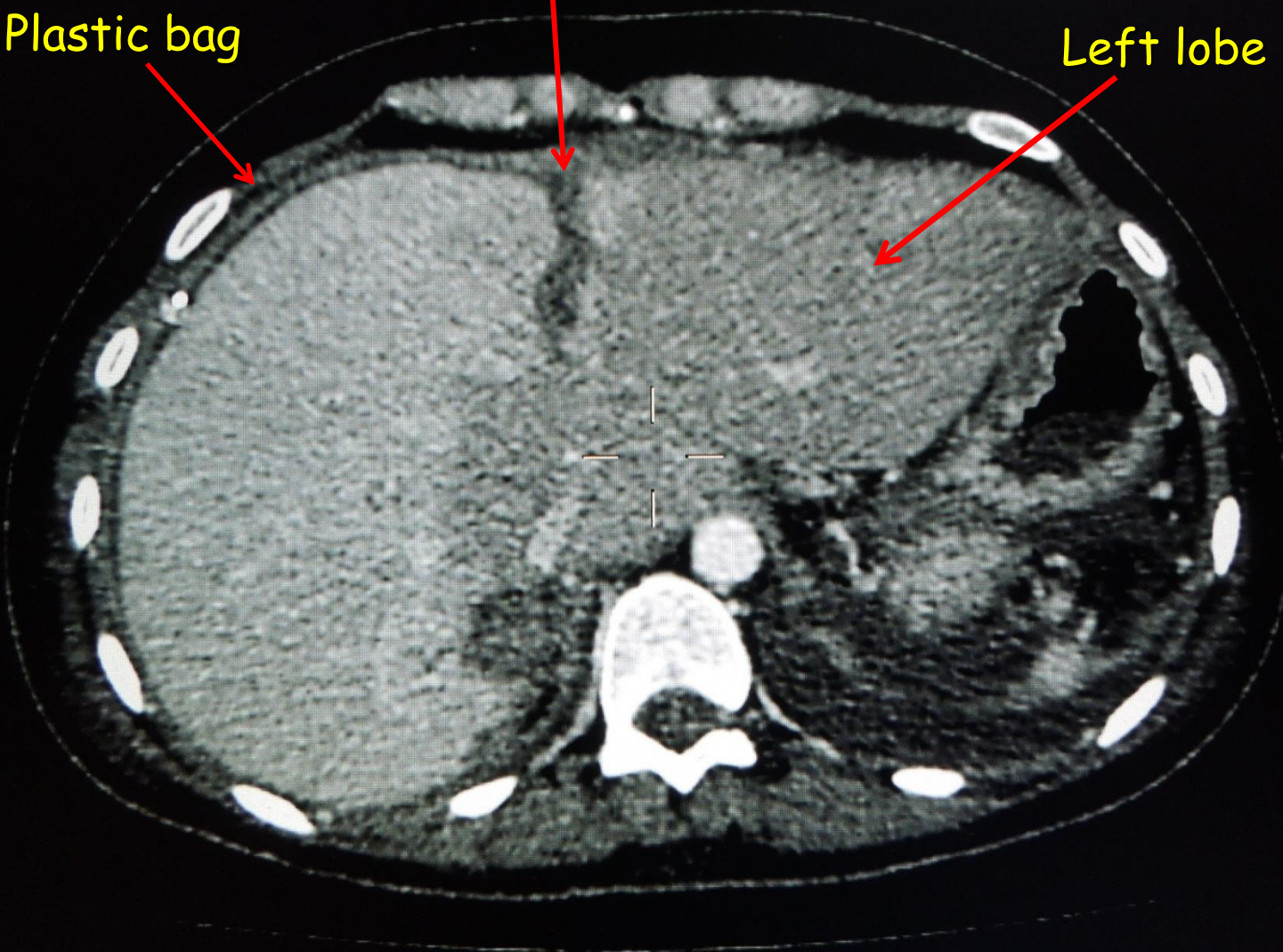


The right extended lobe is covered with plastic bag

Transection line

Plastic bag

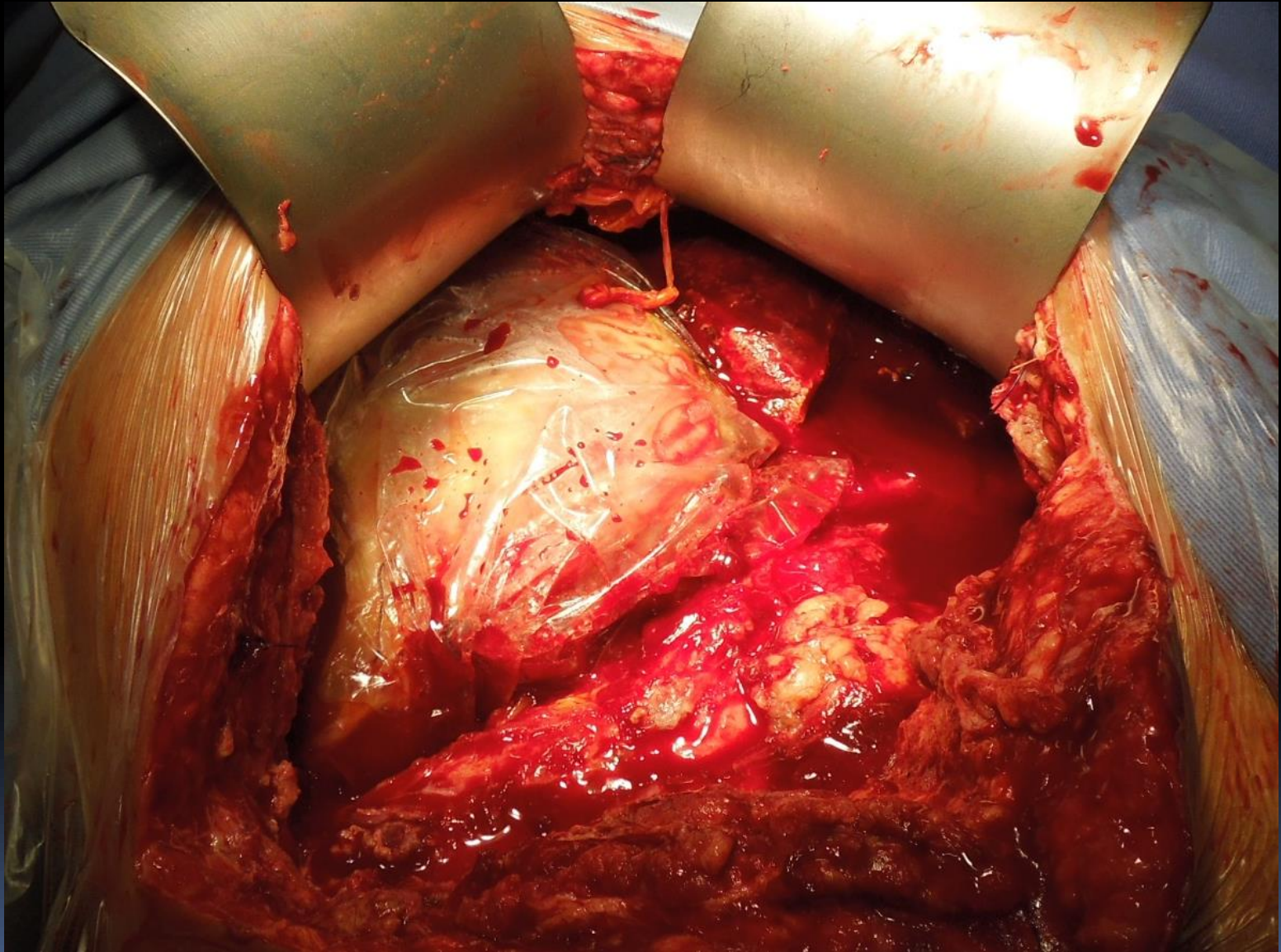
Left lobe



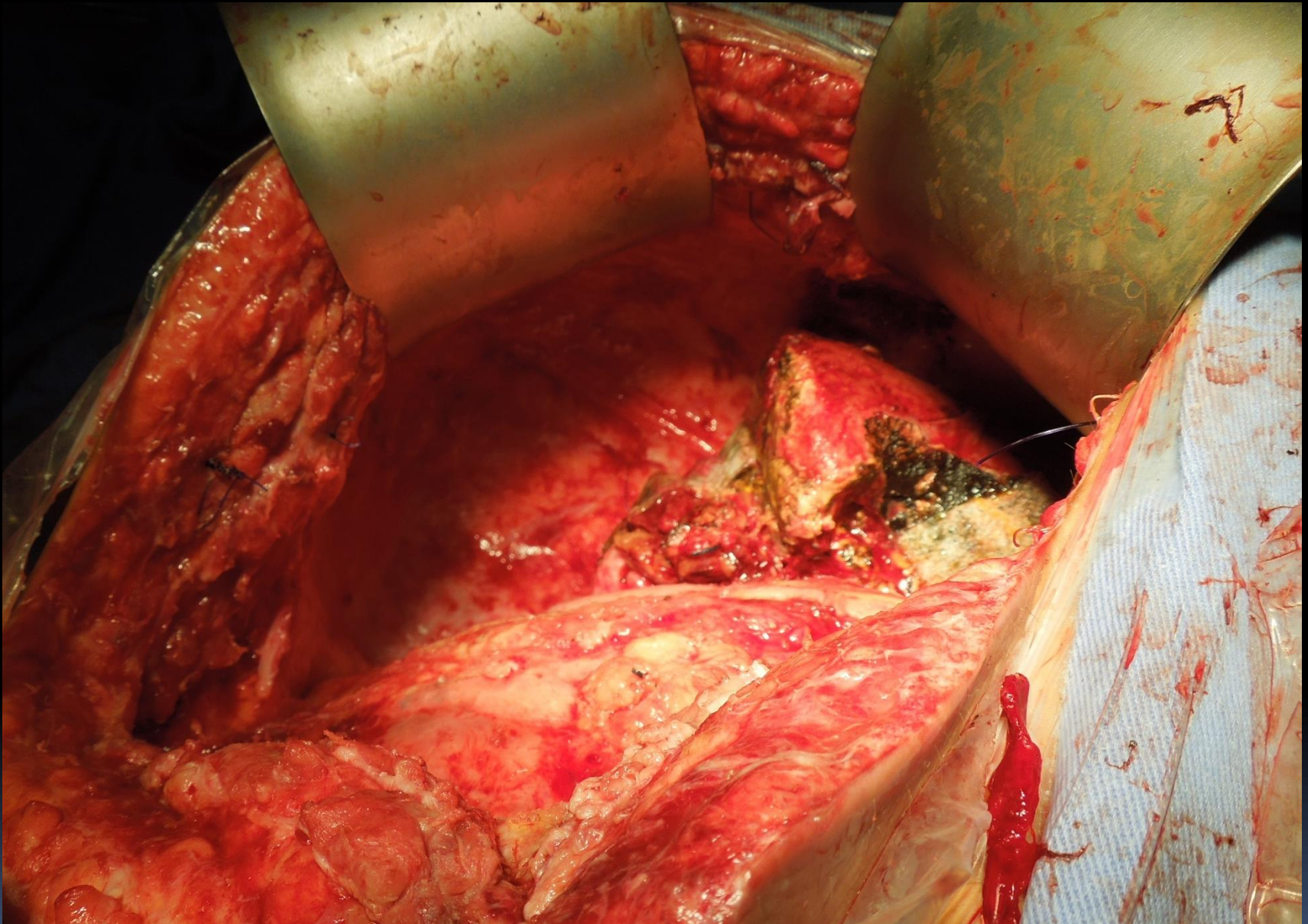
10 cm

R

Second operation



The plastic bag is removed from the right extended lobe



- Right artery, bile duct and right hepatic vein is ligated
- Parenchymal bridges of liver tissue divided
- Complete hepatectomy

RESULTS

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

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ABSTRACT – Background - Postoperative liver failure consequent to insufficiency of remnant liver is a feared complication in patients who underwent extensive liver resections. To induce rapid and significant hepatic hypertrophy, associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) has been recently developed for patients which tumor is previously considered unresectable. **Aim** – To present the Brazilian experience with ALPPS approach. **Method** – Were analyzed 39 patients who underwent hepatic resection using ALPPS in nine hospitals. The procedure was performed in two steps. The first operation was portal vein ligation and in situ splitting. In the second operation the right hepatic artery, right bile duct and the right hepatic vein were isolated and ligated. The extended right lobe was

ALPPS in Brazil

- ❑ From July 2011 (1st case) to October 2012
- ❑ 39 ALPPS (9 surgeons)
- ❑ Male 22 (56.4%) and Female 17 (43.6%)
- ❑ Age 20-83 years (57.3 years)
- ❑ Indications:
 - Colorectal liver metastasis 32 (82.0%)
 - Cholangiocarcinoma 3 (7.7%)
 - Sarcoma 2 (5,1%)
 - Hepatocellular carcinoma 1
 - Cistic liver disease 1

ALPPS in Brazil

- ❑ Interval between operations – 14.1 days (5 a 30)
- ❑ Death after first operation – 2 (5.1%)
- ❑ Length of stay – 17.8 days (13-40)
- ❑ Preoperative volumetry – 28 patients (71.7%)
- ❑ Regeneration of 83% (47-211.9%) Obs. 28 cases
- ❑ Plastic bag in 8 patients (20.5%)
- ❑ Tachosil® (18 patients – 46.1%)

ALPPS in Brazil

- ❑ Videolaparoscopy (2 patients)
- ❑ Pancreaticoduodenectomy (1 patient)
- ❑ Reverse + ALPPS (1 patient)

ALPPS in Brazil

❑ Complications:

Pneumonia

Biliary fistula

Enteric fistula

Abdominal hernia

Surgical site infection

SIRS

Ascites

Acute renal failure

Sepsis

Hepatic artery thrombosis

Acute liver failure

Bile duct injury

❑ Mortality – 5 patients (12.8%)

❑ Liver resections performed 262 (11.4% ALPPS)

ALPPS in Brazil

2014 Brazilian Registry

- ❑ 51 cases (6 deaths)
- ❑ Mortality 11.7% (12.8%)

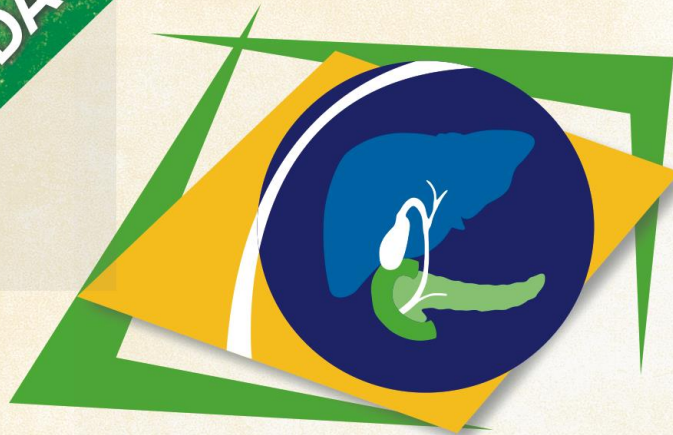
ALPPS in Brazil

- ❑ Liver metastasis (not cholangiocarcinoma)
- ❑ Age Younger patients

Experienced center

The right indications

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OF THE INTERNATIONAL
Hepato-Pancreato-Biliary Association**

April 20-23 2016 - Brazil



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Thank you for your attention !