



Hepatobiliary surgery / Liver transplantation

Dr. med. Markus Quante

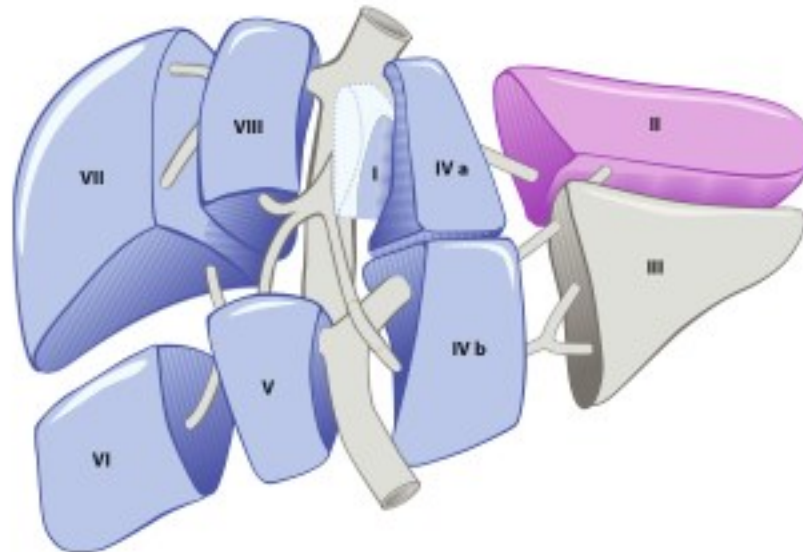
Universitätsklinik für Allgemeine, Viszeral- und Transplantationschirurgie

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Outline

- 1) Topography of the liver
- 2) History of liver surgery
- 3) Benign liver lesions
- 4) Malignant liver lesions
- 5) Liver transplantation

Topography



Liver segments (by Couinaud)

from „Siewert: Chirurgische Therapie“, 7. Auflage

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History of liver surgery:

Advances during the 20th century

- 1908: First report on liver surgery in 8 patients with liver trauma by Hogarth Pringle

Pringle JH; Ann Surg 1908; 48: 541-9

Notes on the arrest of hepatic hemorrhage due to trauma

- 1st World War: „watch & wait“; **Mortality: 66 %**
- 2nd World War: Technical advances and improved medical equipment; **Mortality: 27 %**

Madding GF, Lawrence K; Surgery 1955: 275

Wounds of the liver and the extrahepatic biliary tract

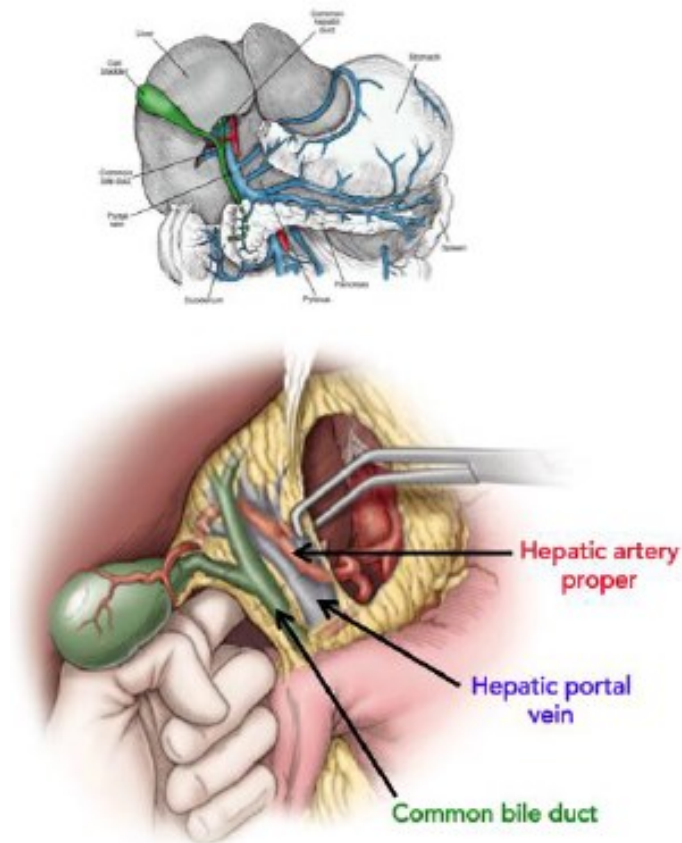
- Korean-War: **Mortality: 14 %**

Morrison JJ, Bramley KE, Rizzo AG; J R Army Med Corps 2011; 157: 136

Liver trauma - operative management



Pringle maneuver



Source: www.usmle-forums.com

History of liver surgery:

Advances during the 20th century

- Vietnam-War: Incidence of liver trauma : 20-27 %
Mortality in armed forces: **4.5 %**
Mortality in civilians: 12 %
Pilcher D; Ann Surg 1969; 170: 793
Penetrating injuries of the liver in Vietnam
- 1972: Paradigm shift towards non-operative management:
 - 1. 50-80 % of liver bleeding persists spontaneously
 - 2. successful conservative treatment in children
 - 3. improved imaging techniques*Ritchie JP; Arch Surg 1972; 104: 781-4: Subcapsular hematoma of the liver: nonoperative management*



History of liver surgery:

Advances during the 20th century

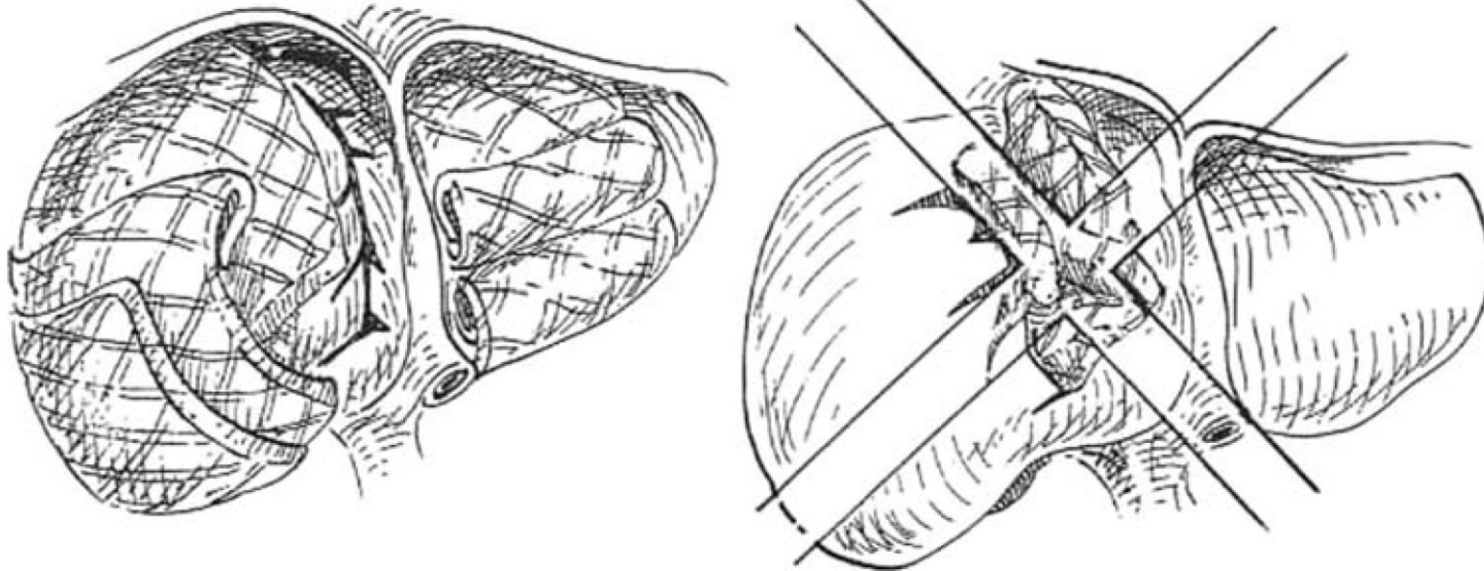
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Liver trauma – CT scan



Liver trauma – packing concept

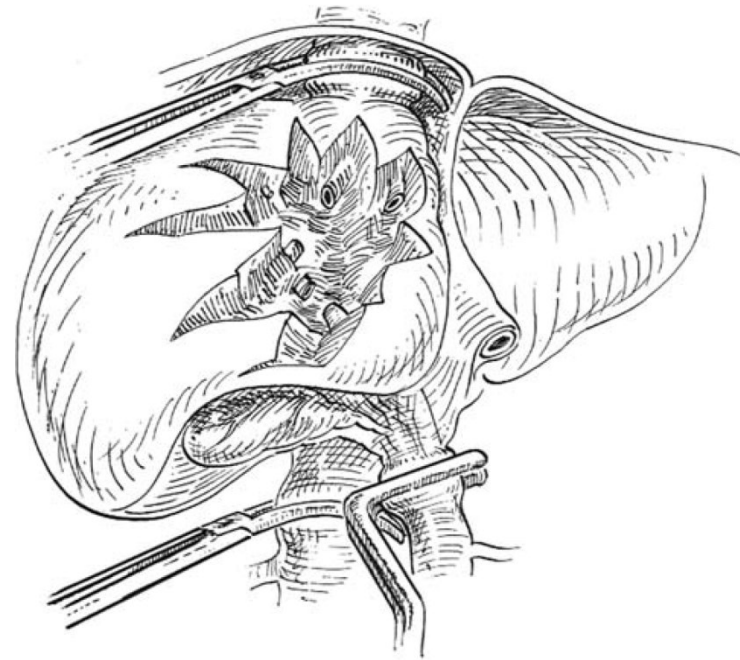
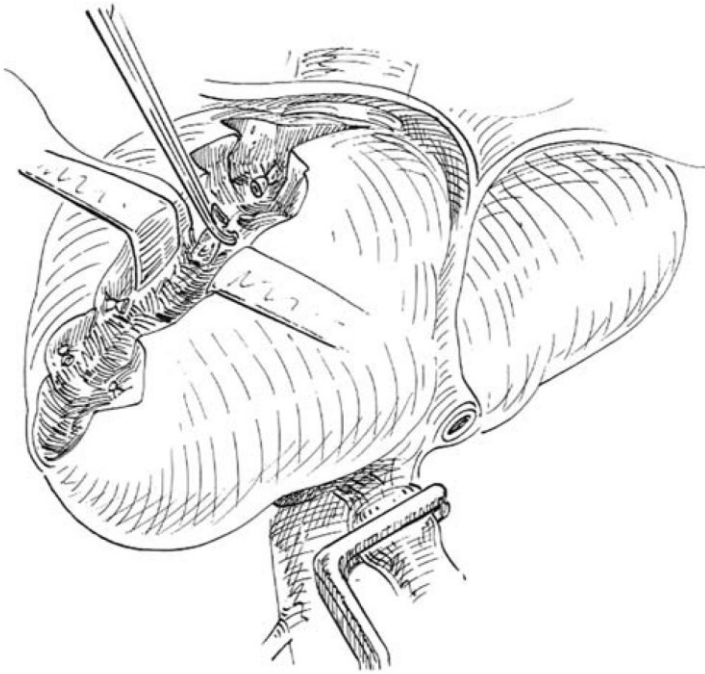


Six-Pack-Technique

from: Krige, Borman, Terblanche. South Afr J Surg 1997; 1: 10-5

Liver Trauma in 446 Patients

Liver trauma – operative strategies



Liver resection only in 5% of cases with traumatic injuries

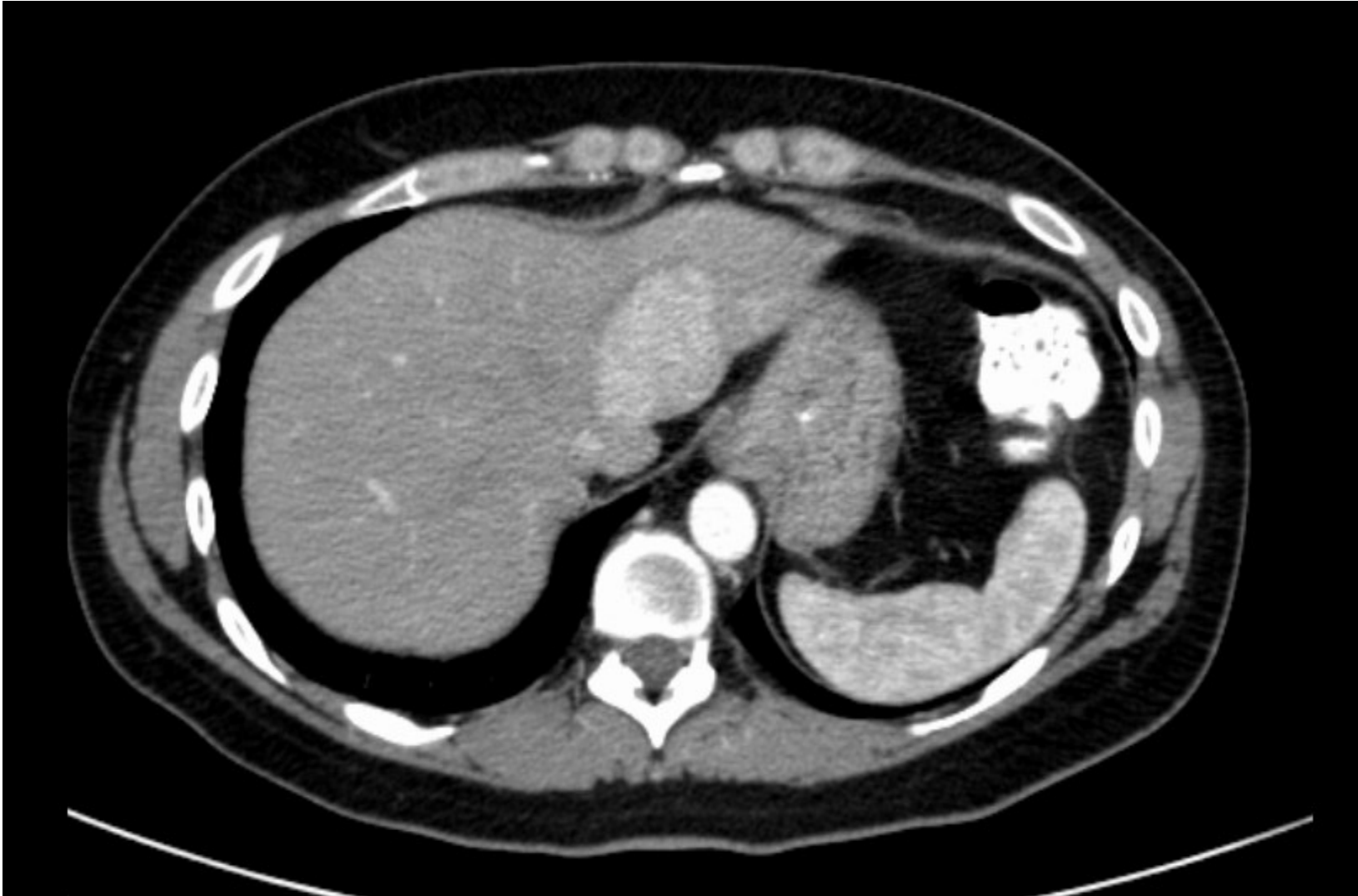
Outline

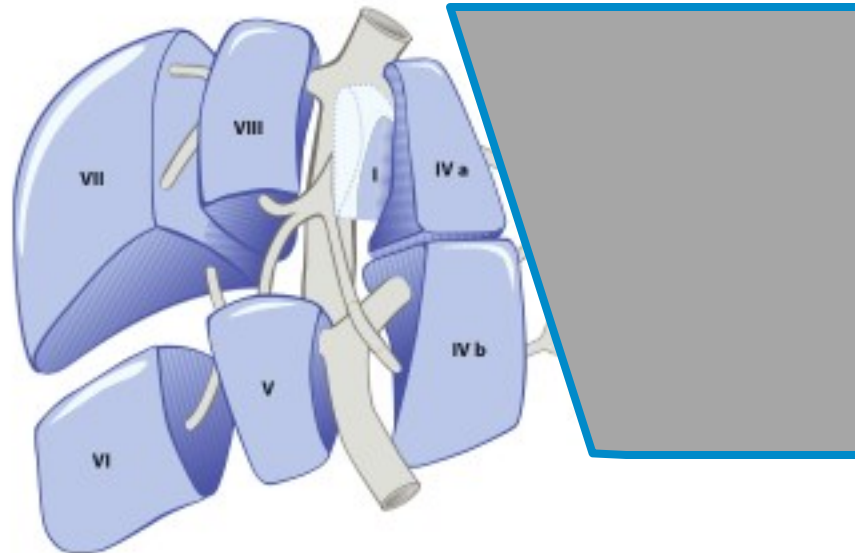
- 1) Topography of the liver
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- 4) Malignant liver lesions
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Case I

- 42 y/o female patient
- Solid liver lesion (ID 11/2012), suspect of hepatic adenoma
- History of recurrent abdominal pain localized to the epigastrium or right upper quadrant
- Gastroscopy w/o relevant findings
- No effect after withdrawal of contraceptive medication

CT-Scan

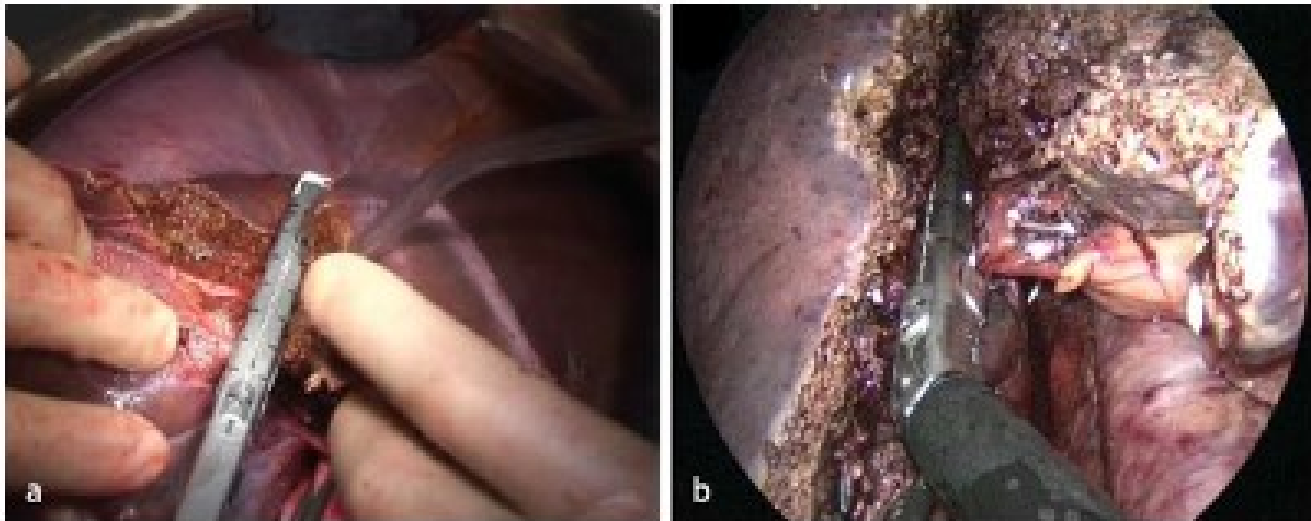




Left lateral segmentectomy (Seg. II + III)

aus „Siewert: Chirurgische Therapie“, 7. Auflage

Surgical techniques for liver resection



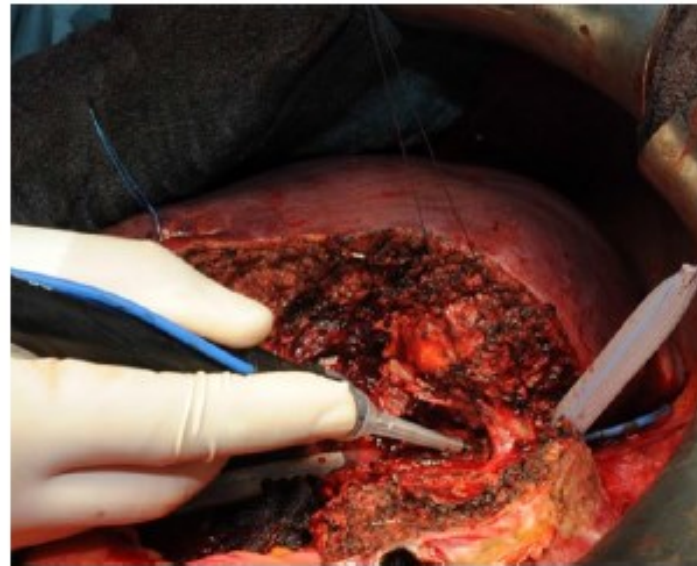
Vascular stapler

from: Bruns et. al., „Lebertranssektion – Moderne Verfahren“, 2015

Surgical techniques for liver resection



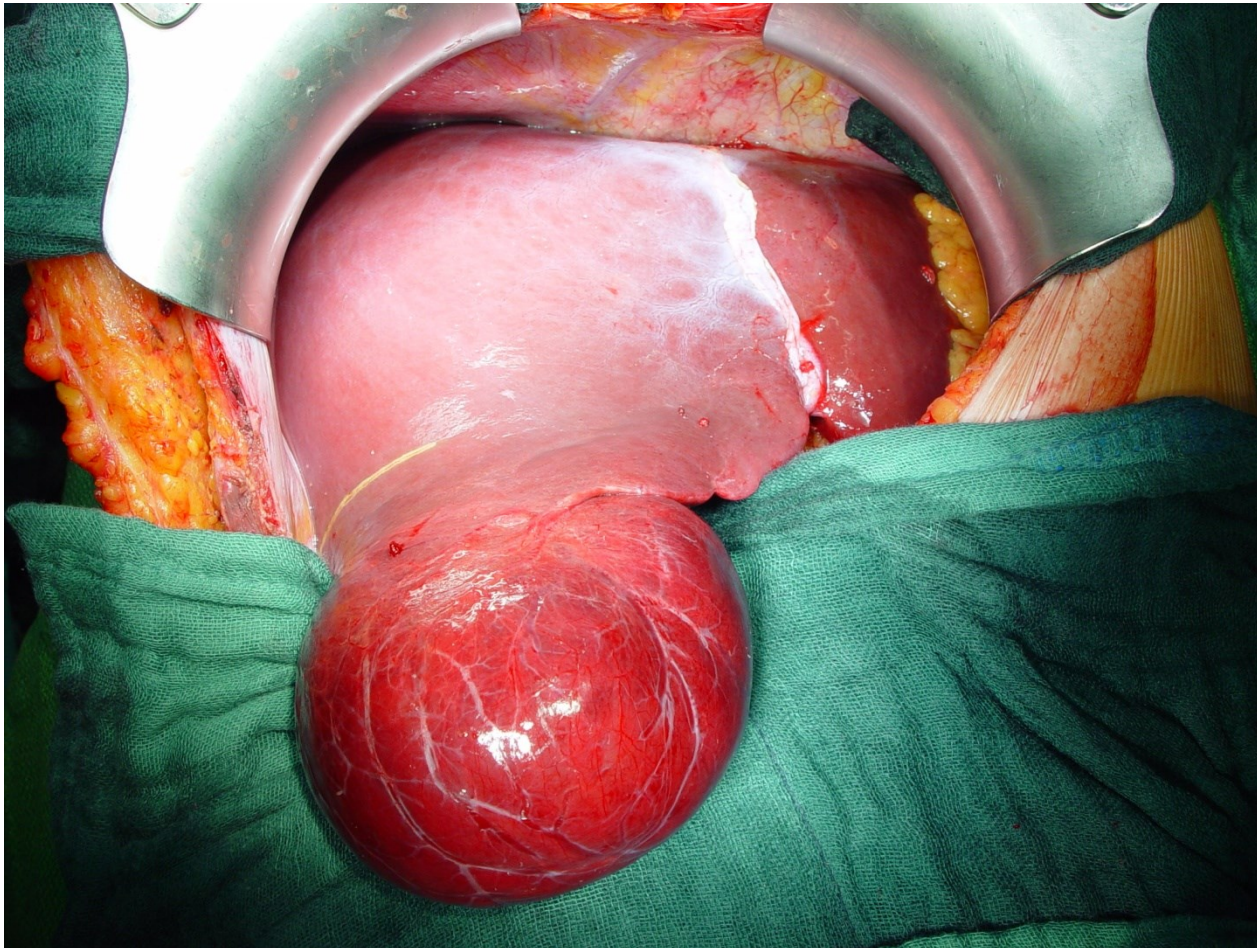
LigaSure



**Cavitron Ultrasonic Surgical Aspirator
(CUSA)**

from: Bruns et. al., „Lebertranssektion – Moderne Verfahren“, 2015

Hepatic adenoma



Hepatic adenoma



Hepatic adenoma



Hepatic adenoma

- benign epithelial liver tumors that develop in an otherwise normal-appearing liver
- predominantly in young women (20 to 44 years old)
- strongly associated with use of oral contraceptives, anabolic androgens, and glycogen storage disease
- associated with malignant transformation, spontaneous hemorrhage, and rupture
- **recommendation for resection of all symptomatic hepatic adenomas and adenomas >5 cm**

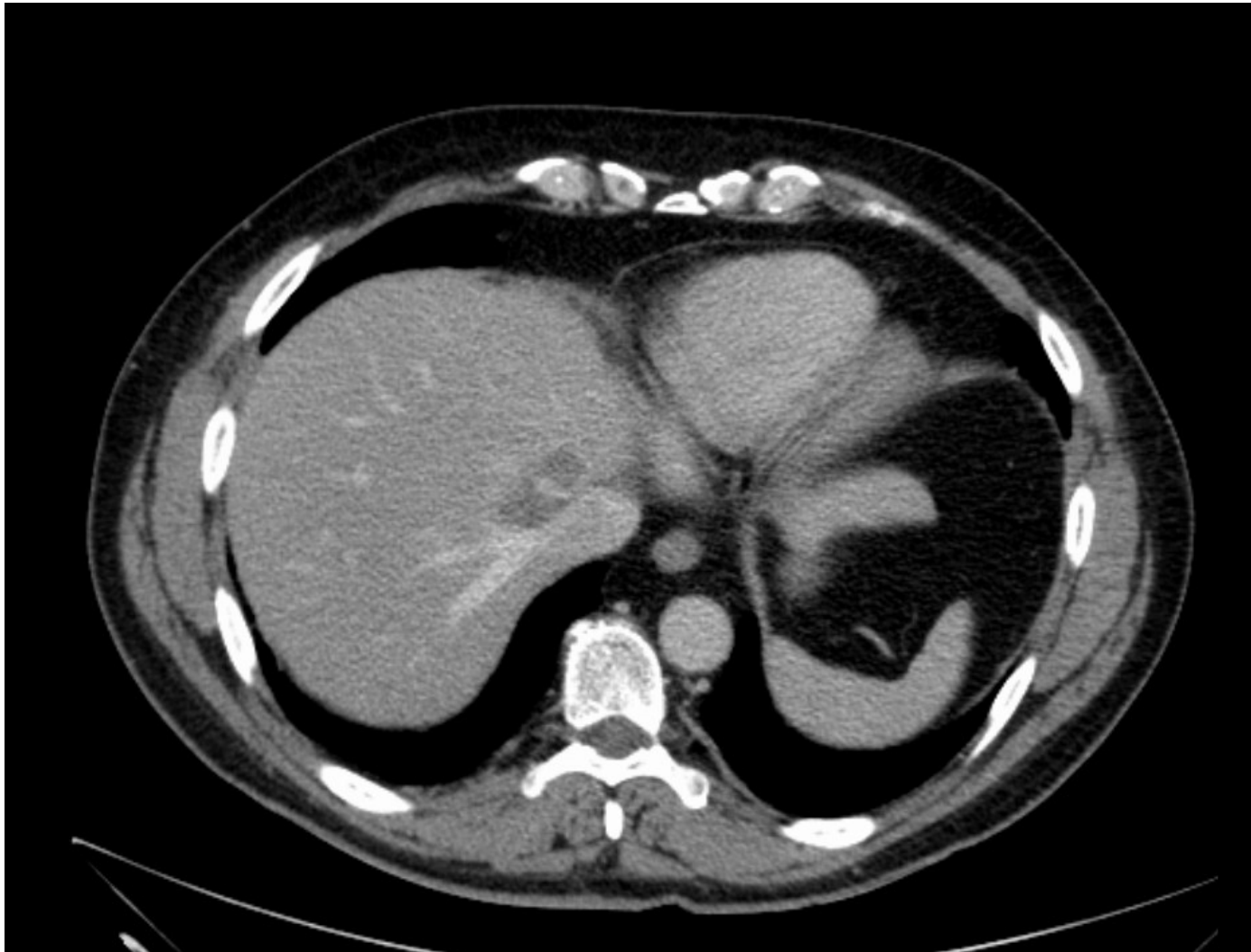
Outline

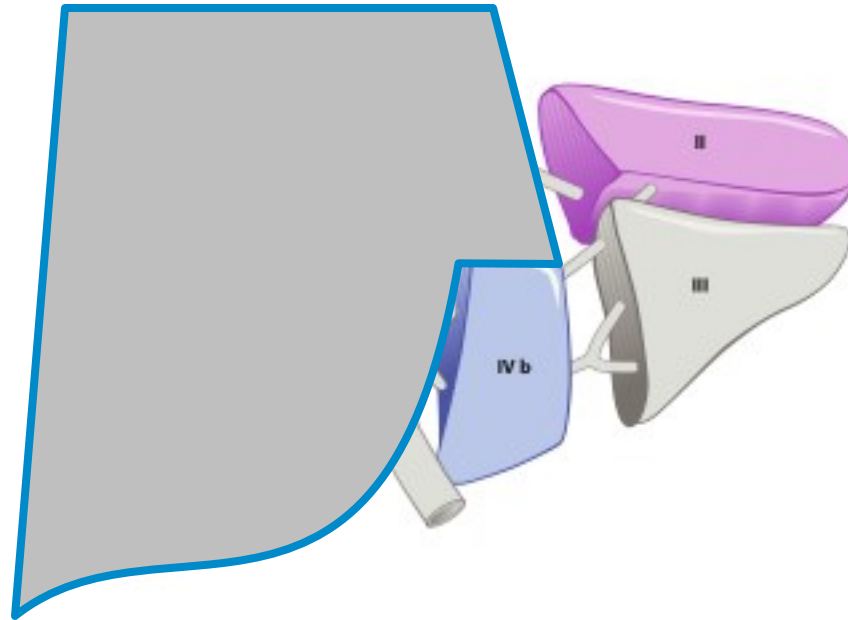
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- 4) **Malignant liver lesions**
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Case II

- 56 y/o male patient
- Medical history of rectal adenocarcinoma, status post surgical resection (pT3 pN1 M0; L0 V1 R0; ID 06/2010)
- start of adjuvant chemotherapy, but cessation due to development of severe neurotoxicity III°
- 08/2012 detection of a suspect central liver lesion, CEA negative
- 11/2012 increasing size and CEA positive

CT-Scan





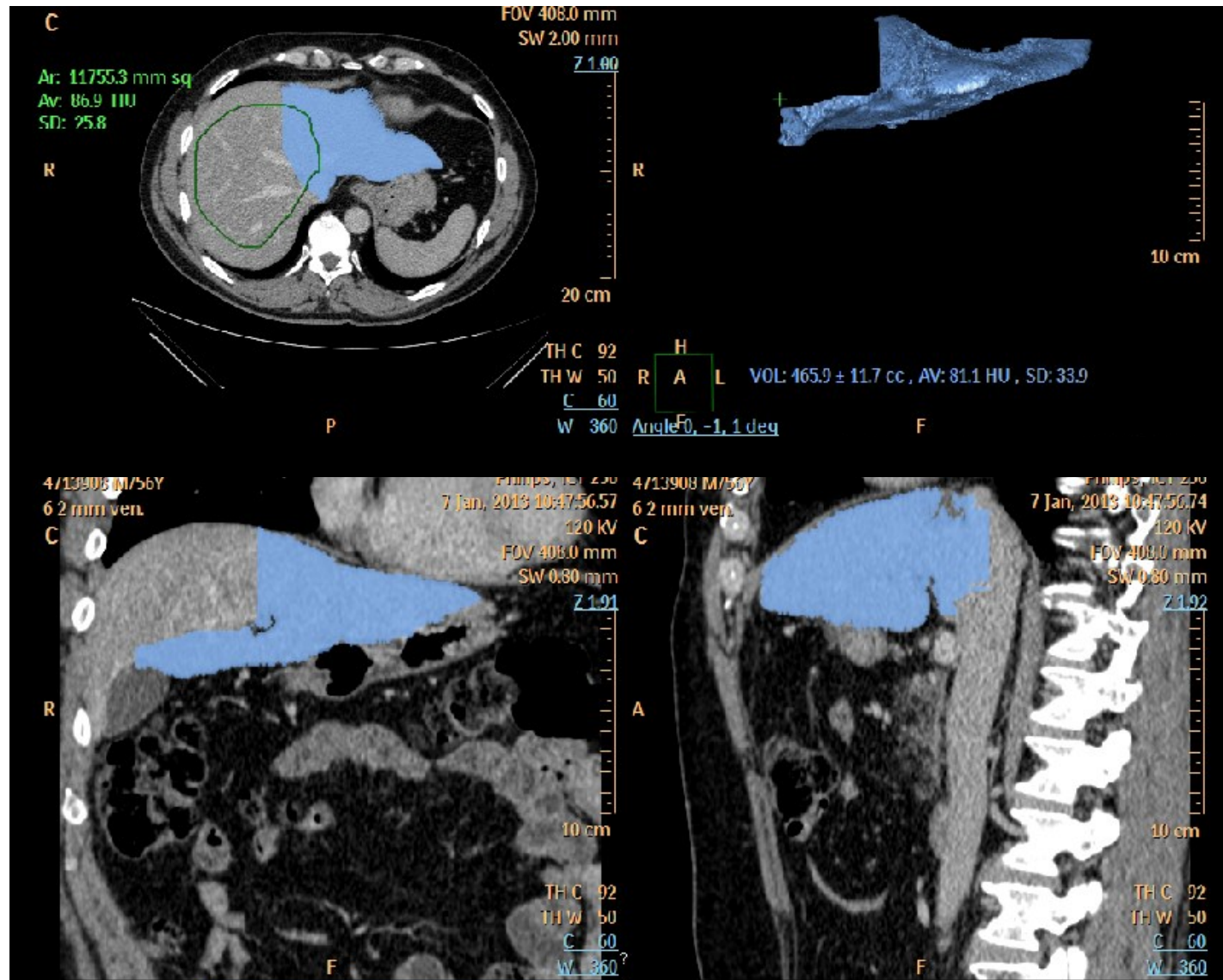
Extended right hepatectomy (Seg. V-VIII + IVa)

aus „Siewert: Chirurgische Therapie“, 7. Auflage

The amount of the future liver remnant volume is fundamental for hepato-biliary surgery, representing an important potential risk-factor for the development of post-operative liver failure.

- Volume total liver: 1811 ml +/- 23,4 ml
- Volume segment II, III and IVb: 471 ml +/- 12,6 ml
- Calculated remnant volume: **26%** of total volume

Liver volumetry



Extrahepatic cholangiocarcinoma (Klatskin-Tumor)

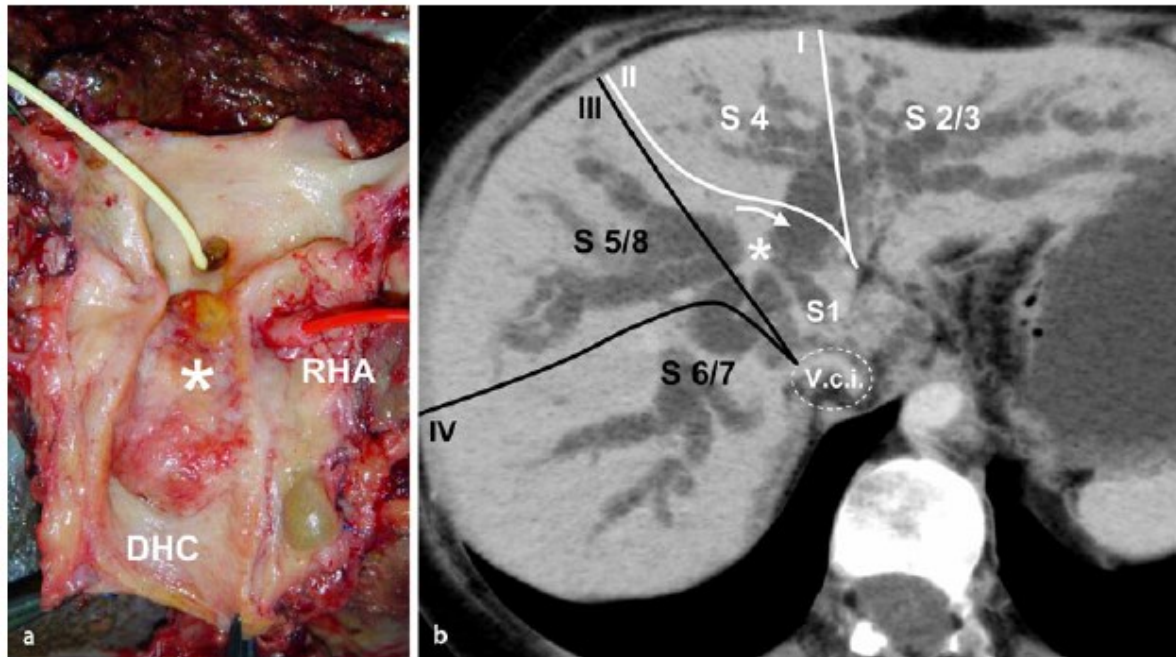


- Rare incidence at 1:100000
- Median survival in a palliative setting 6-12 months
- Major hepatic resections often including resection and reconstruction of the hepatic artery or the portal vein are the only curative option
- Often multimodal concepts: pre-operative biliary drainage, portal vein embolisation, staging laparoscopy and neo-adjuvant chemotherapy

Extrahepatic cholangiocarcinoma (Klatskin-Tumor)



Extrahepatic cholangiocarcinoma (Klatskin-Tumor)

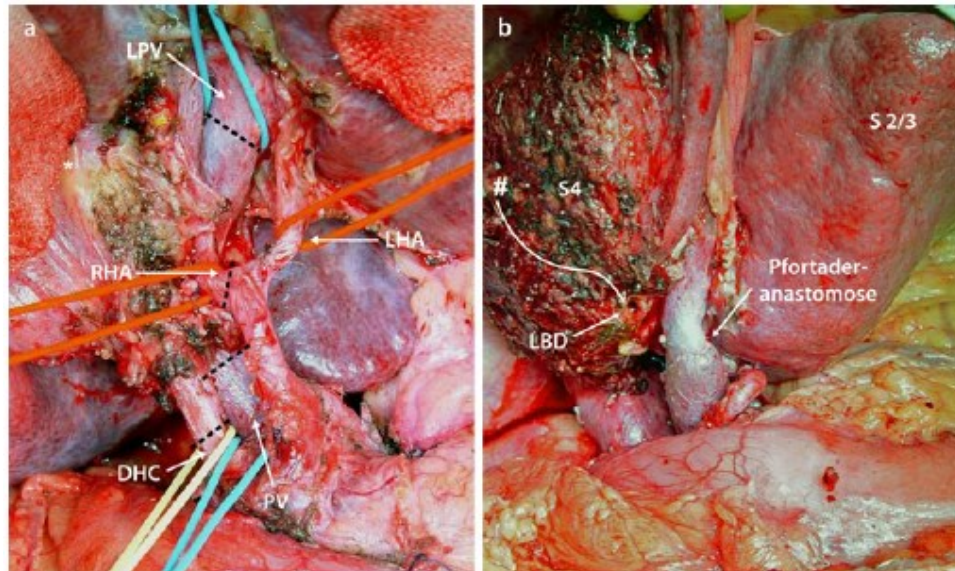


Right hepatic trisegmentectomy

from: Seehofer, Kamphues, Neuhaus. *Chirurg.* 2012 Mar;83(3):221-8.

Resektion of Klatskin tumors

Extrahepatic cholangiocarcinoma (Klatskin-Tumor)



Hilar En-bloc-Resection

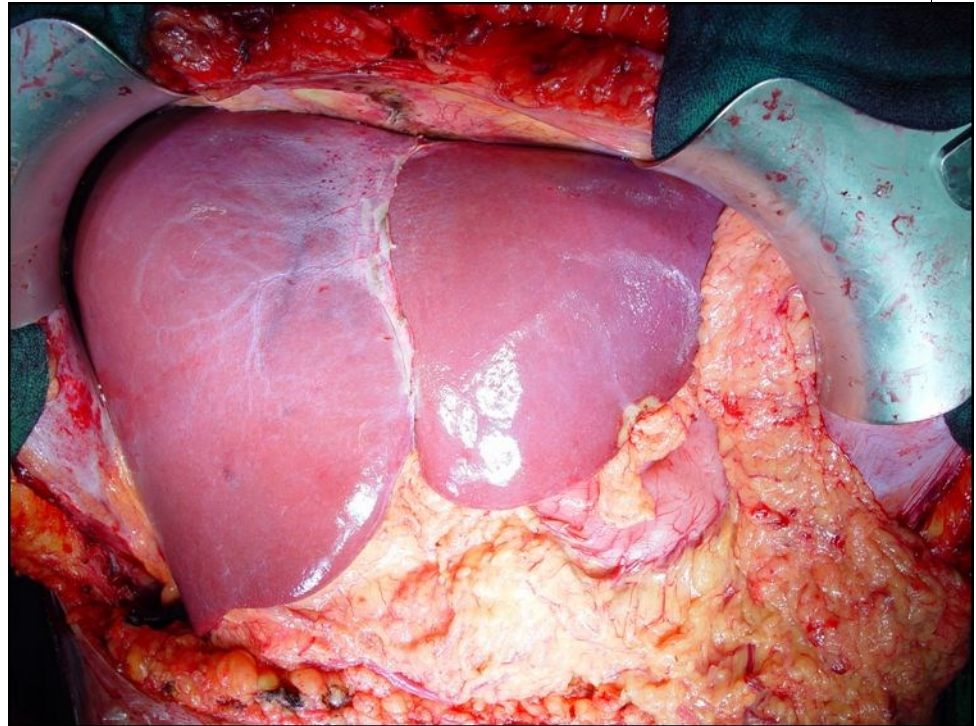
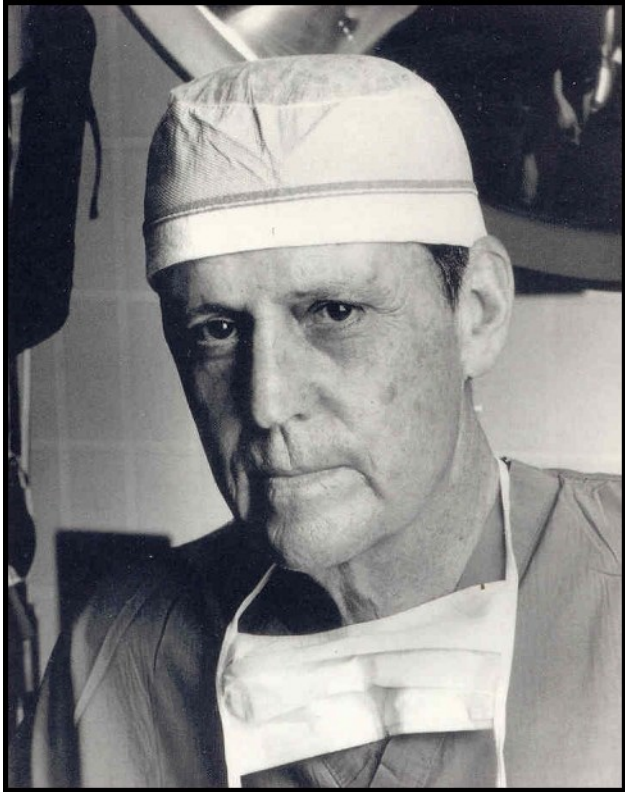
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Resektion of Klatskin tumors

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First liver transplantation



HOMOTRANSPLANTATION OF THE LIVER IN HUMANS

T. E. STARZL, M.D., F.A.C.S., T. L. MARCHIORO, M.D., K. N. VON KAULLA, M.D., G. HERMANN, M.D., R. S. BRITTAIN, M.D., and W. R. WADDELL, M.D., F.A.C.S.

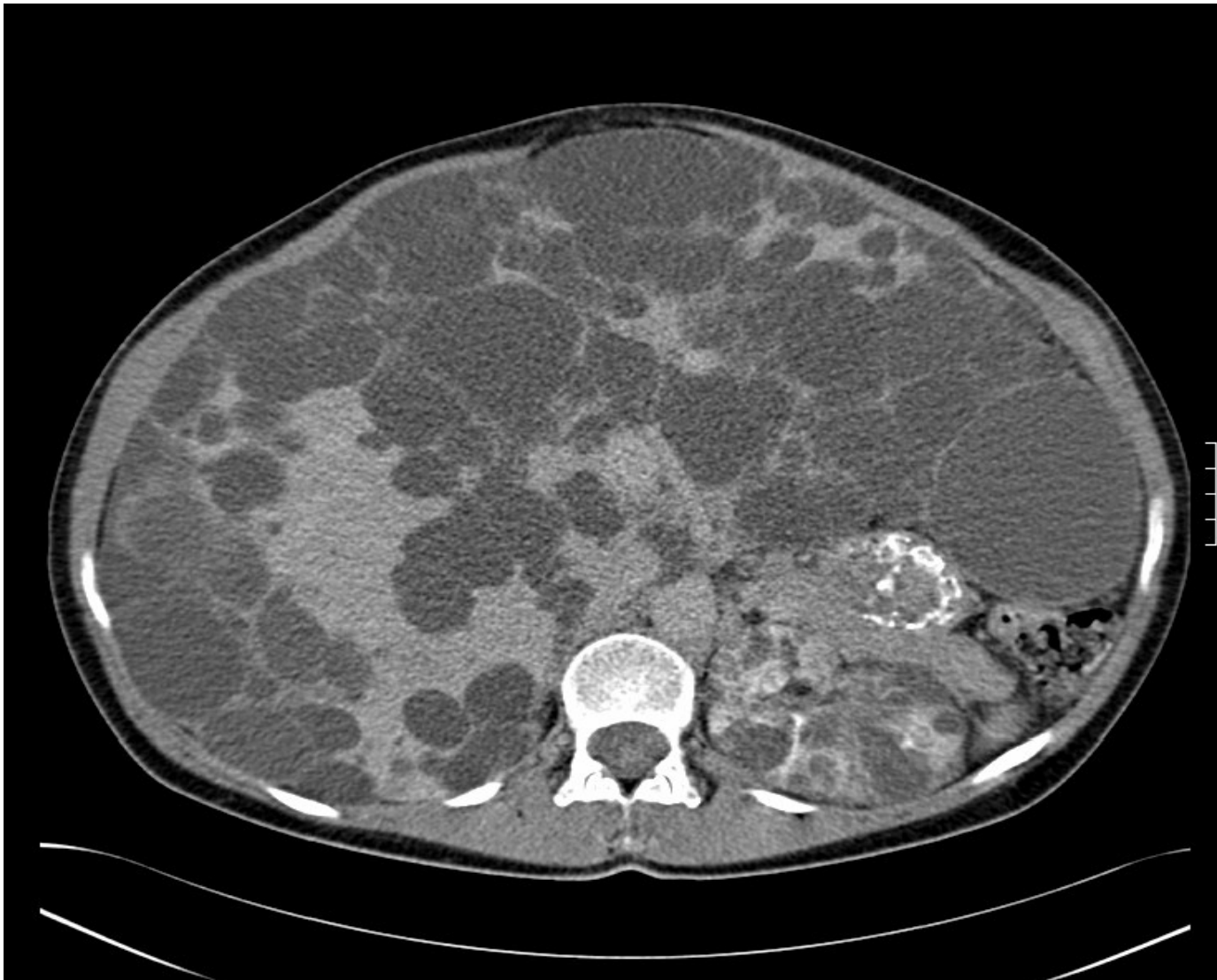
Denver, Colorado

Surg Gynecol Obstet. 1963 December ; 117: 659–676.

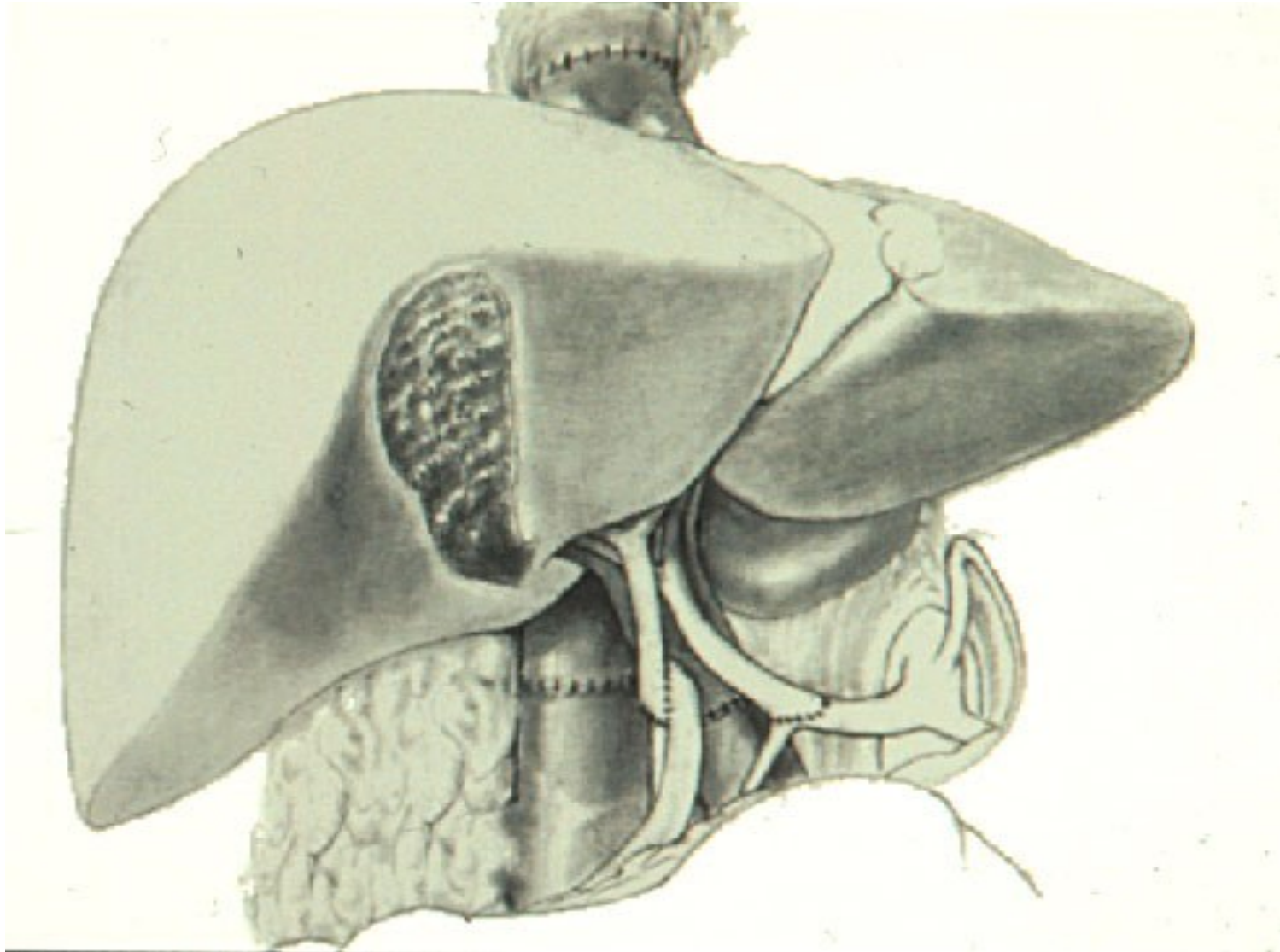
Liver transplantation – technical aspects



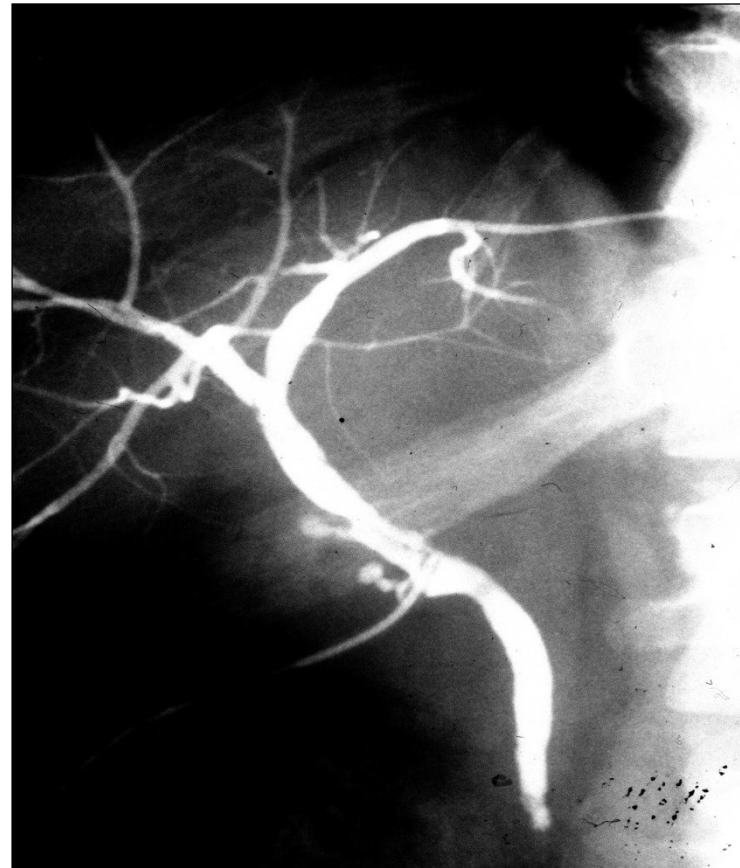
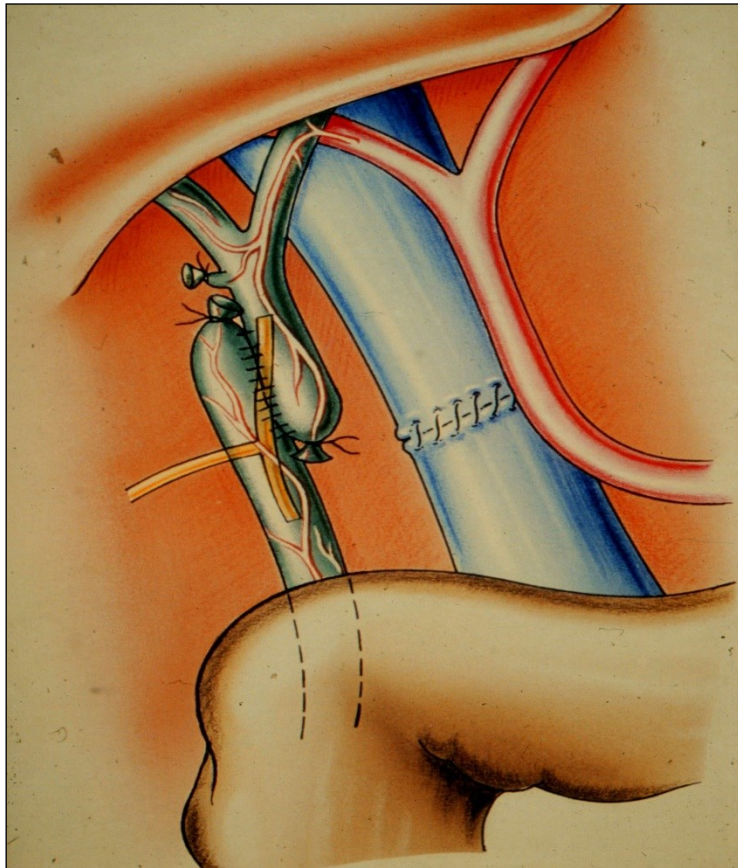
Liver transplantation – CT scan



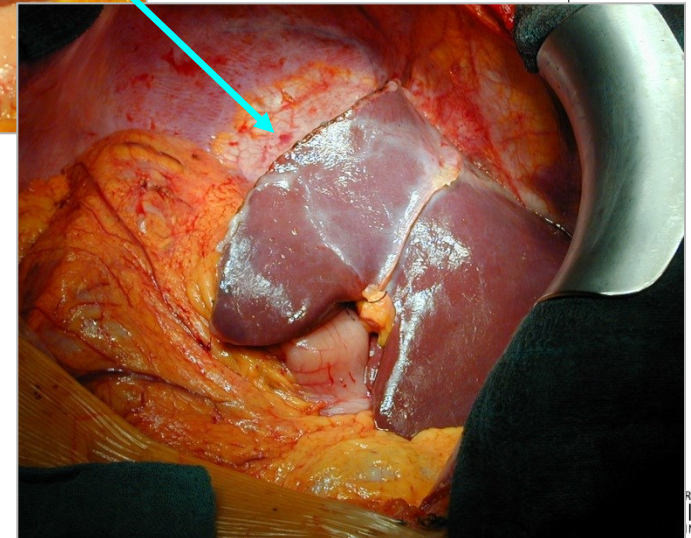
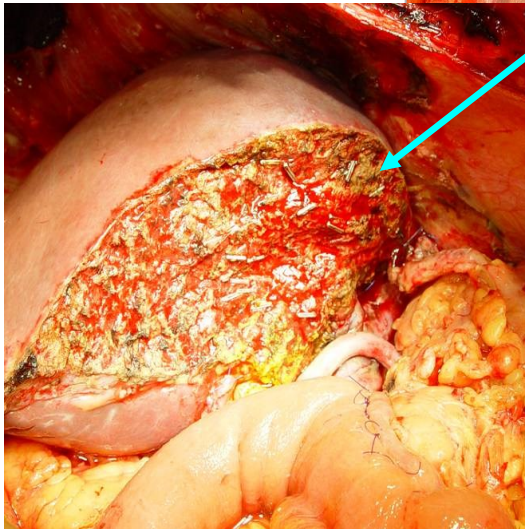
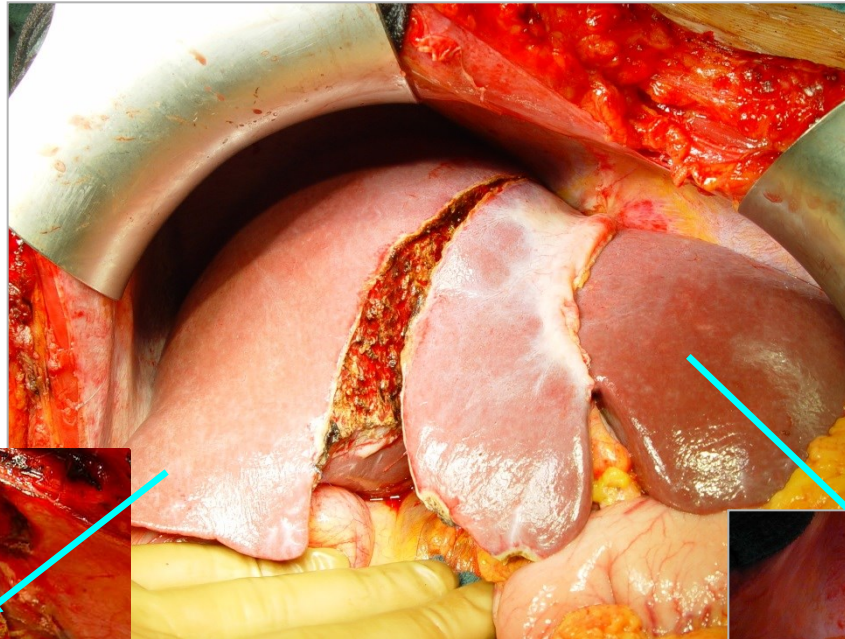
Liver transplantation – technique



Liver transplantation – bile duct anastomosis



Expansion of the donor pool – living donation



Expansion of the donor pool – living donation

Application of Reduced-size Liver Transplants as Split Grafts, Auxiliary Orthotopic Grafts, and Living Related Segmental Transplants

C. E. BROELSCH, M.D., F.A.C.S.,* J. C. EMOND, M.D.,* P. F. WHITINGTON, M.D.,†
J. R. THISTLETHWAITE, M.D.,* A. L. BAKER,‡ and J. L. LICHTOR, M.D.

Ann Surg 1990;212:368–
75; discussion 375–7.

