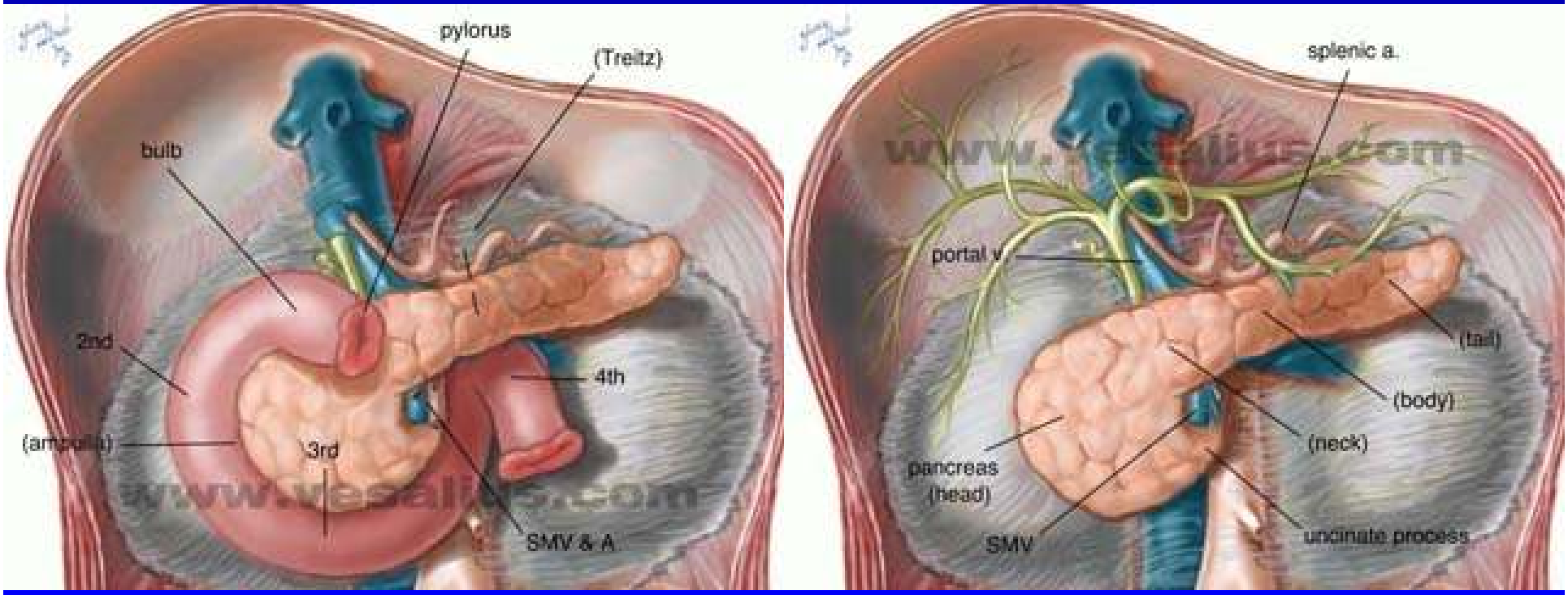
HPB Malignancy

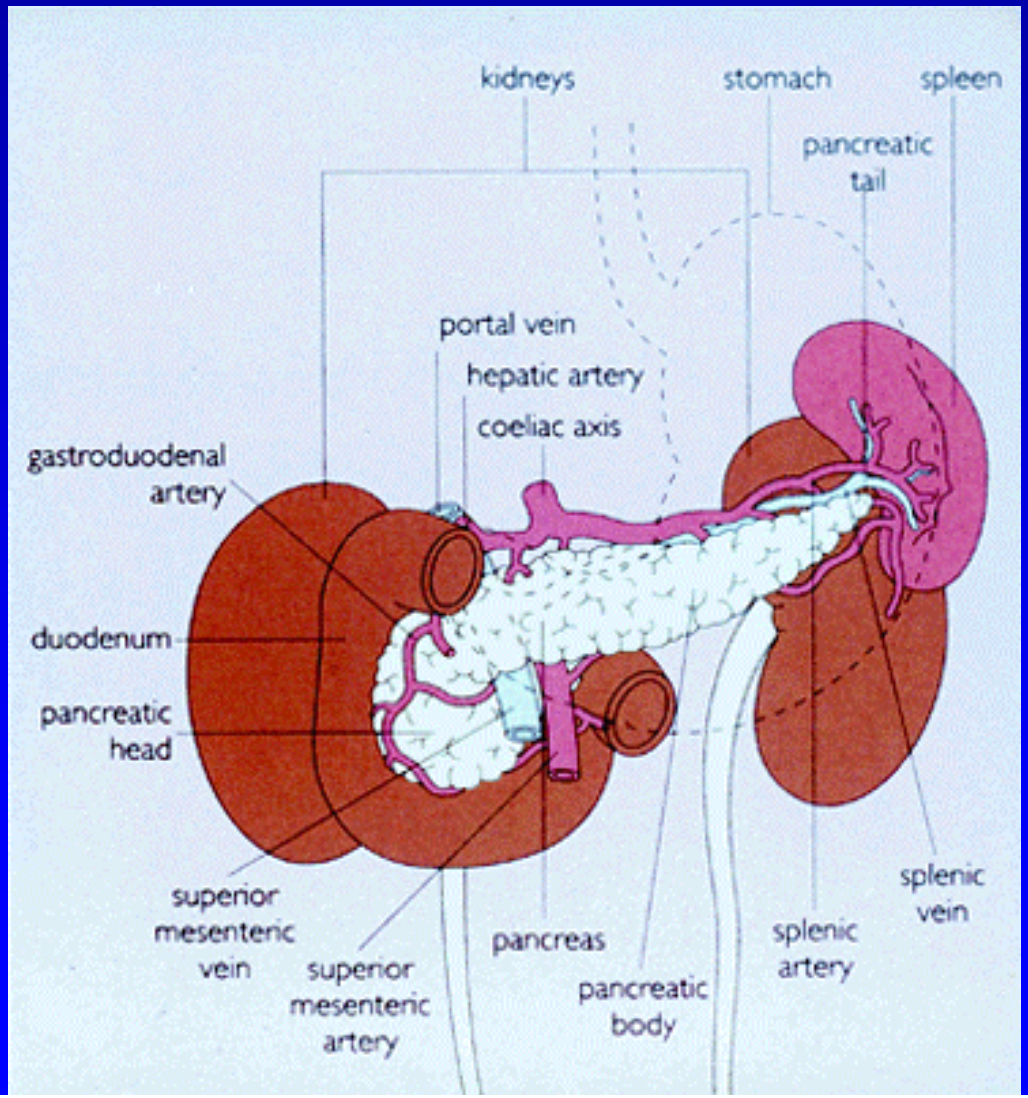
University Hospital Birmingham
NHS Foundation Trust

Pancreas

The Pancreas



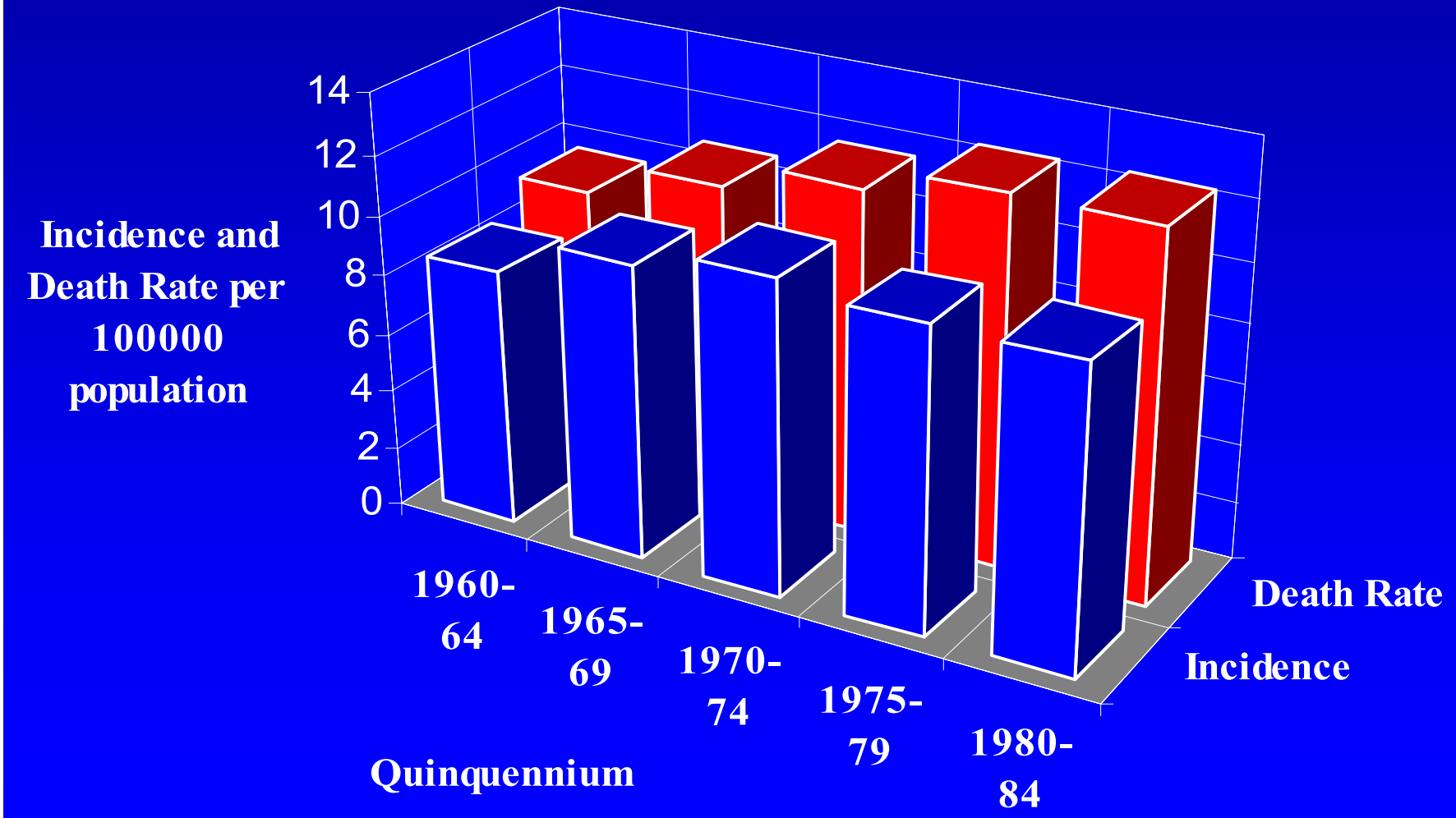
Pancreas Anatomy



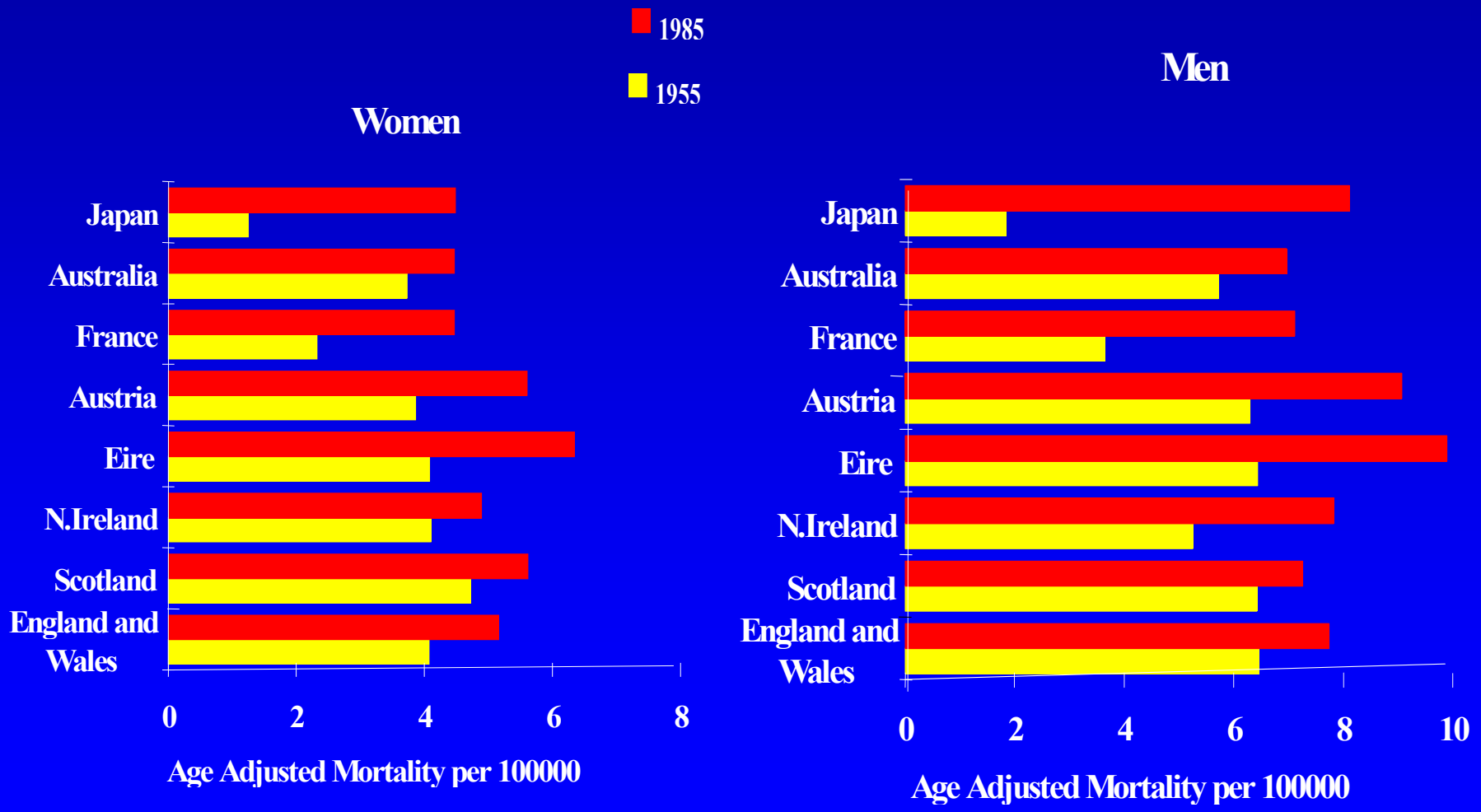
Pancreatic Cancer

- 5th leading cause of cancer death in UK
- ≈ 6000 deaths PA in England & Wales
- 5% cancer deaths but 3% of incidence
- High disease specific mortality (overall 5YSR <0.4%)
- For the majority - survival measured in weeks
- Resection rate at best ≈ 15-20%

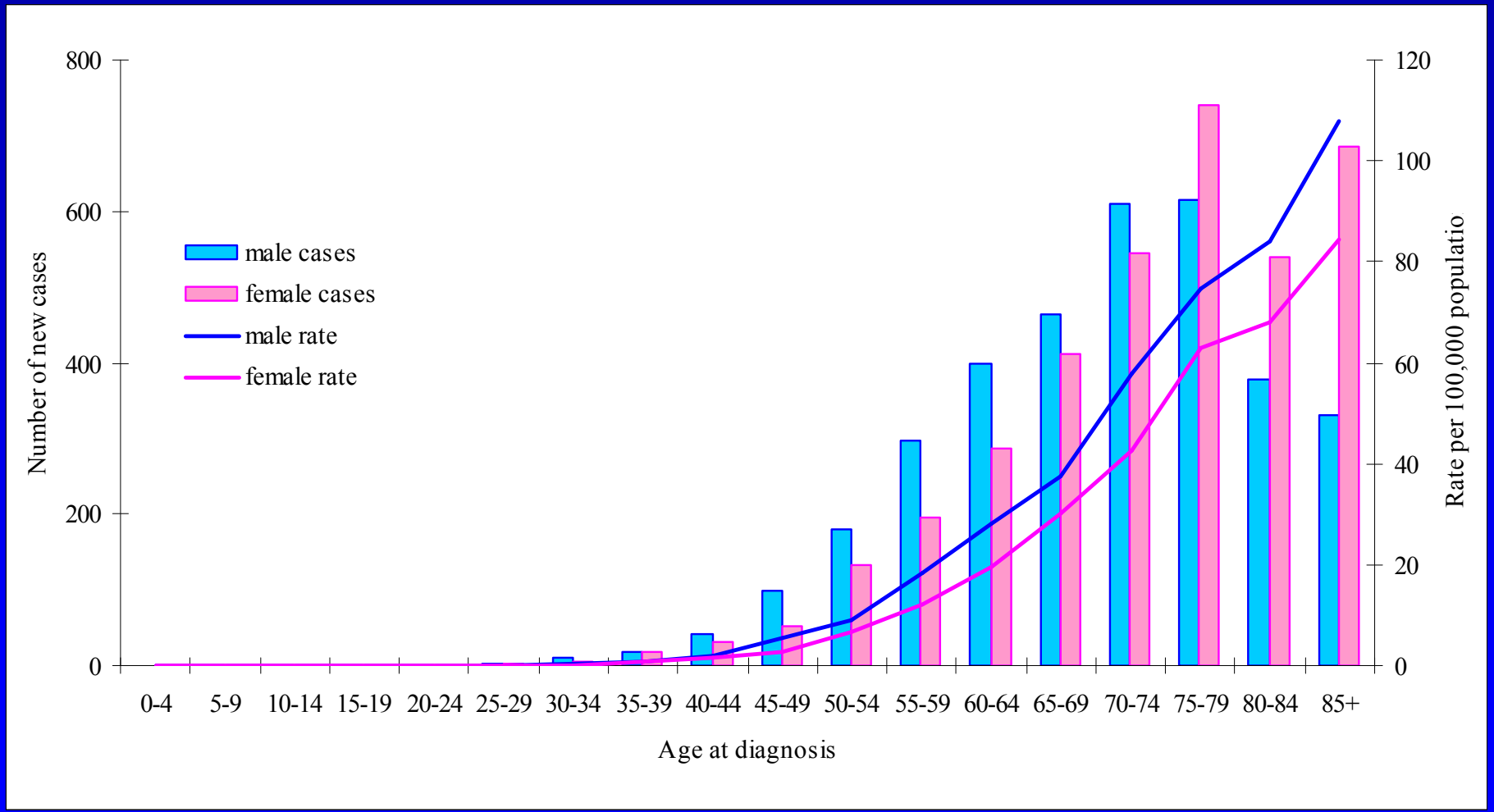
Age Standardized Incidence of Pancreatic Cancer (WM pop. 5.5m) cf National Crude Death Rates (pop. 60m)



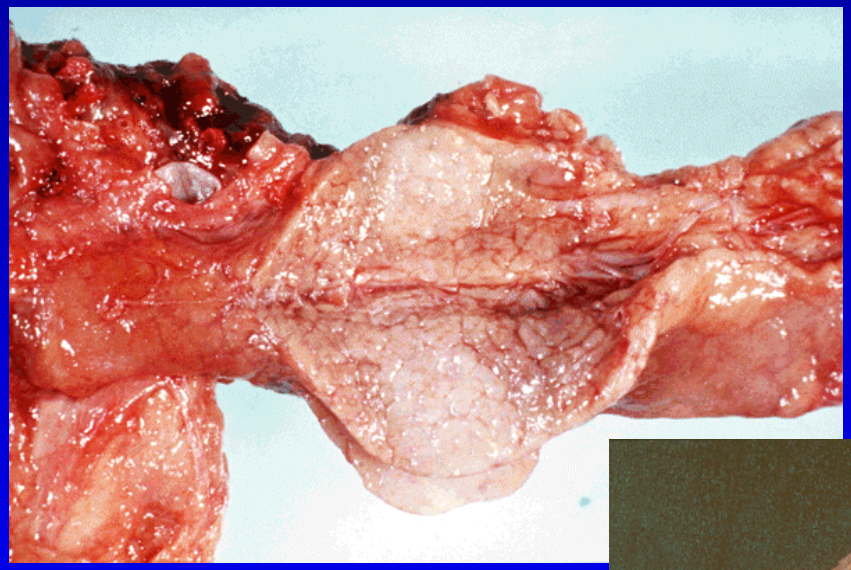
Pancreatic Cancer Mortality in 1955 & 1985 in Men & Women



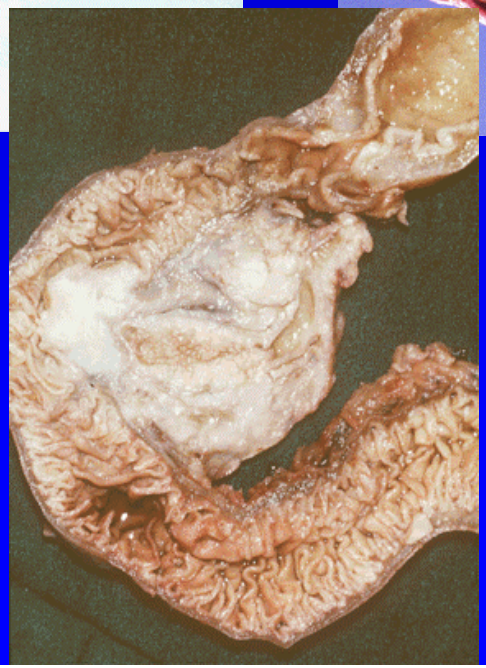
Age Specific Rates of Pancreatic Cancer (UK)



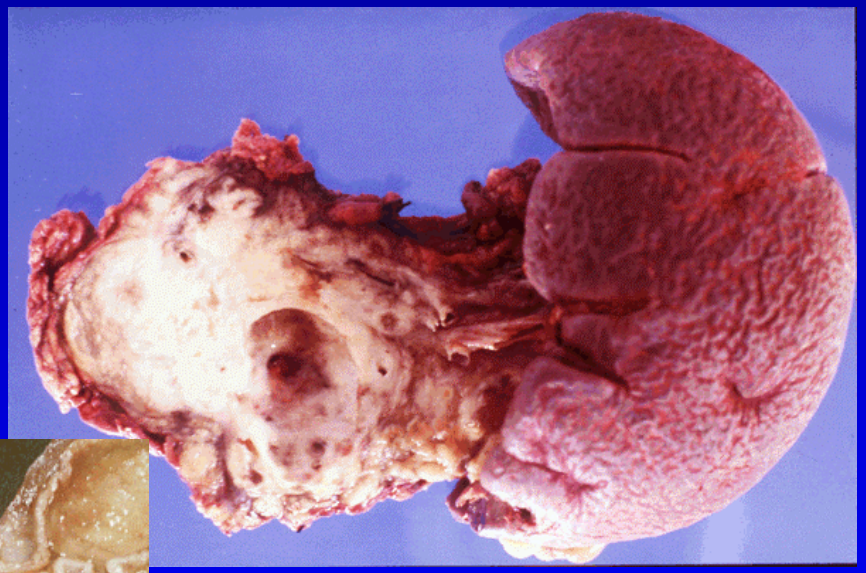
Ductal Adenocarcinoma of Pancreas



Body

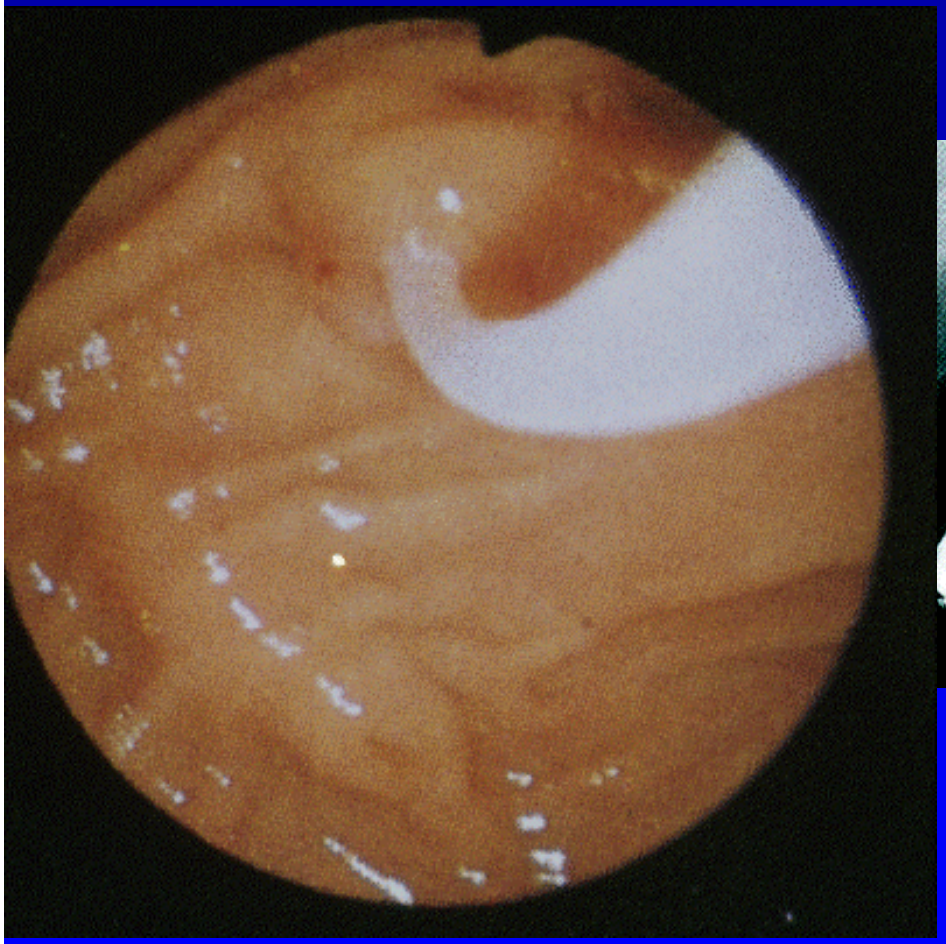


Head

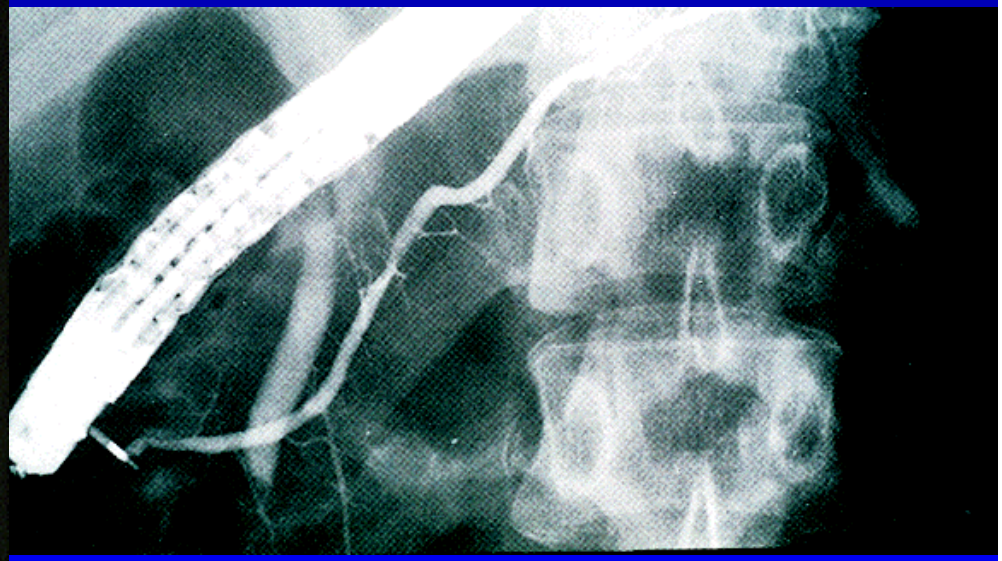


Tail

Endoscopic Retrograde Cholangio-Pancreatography (ERCP)

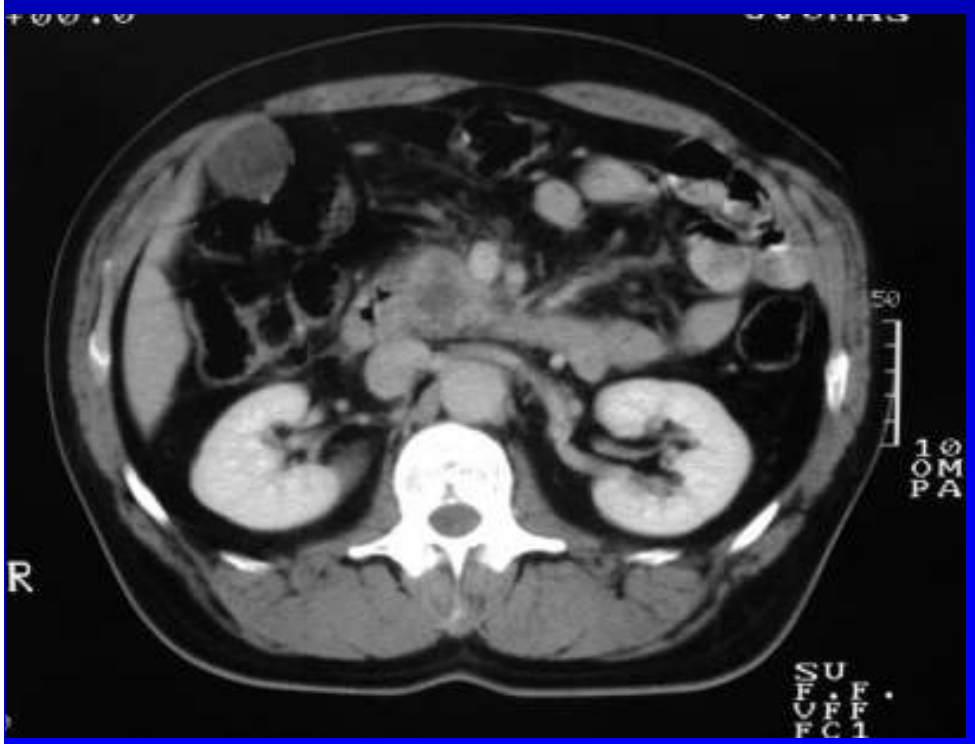


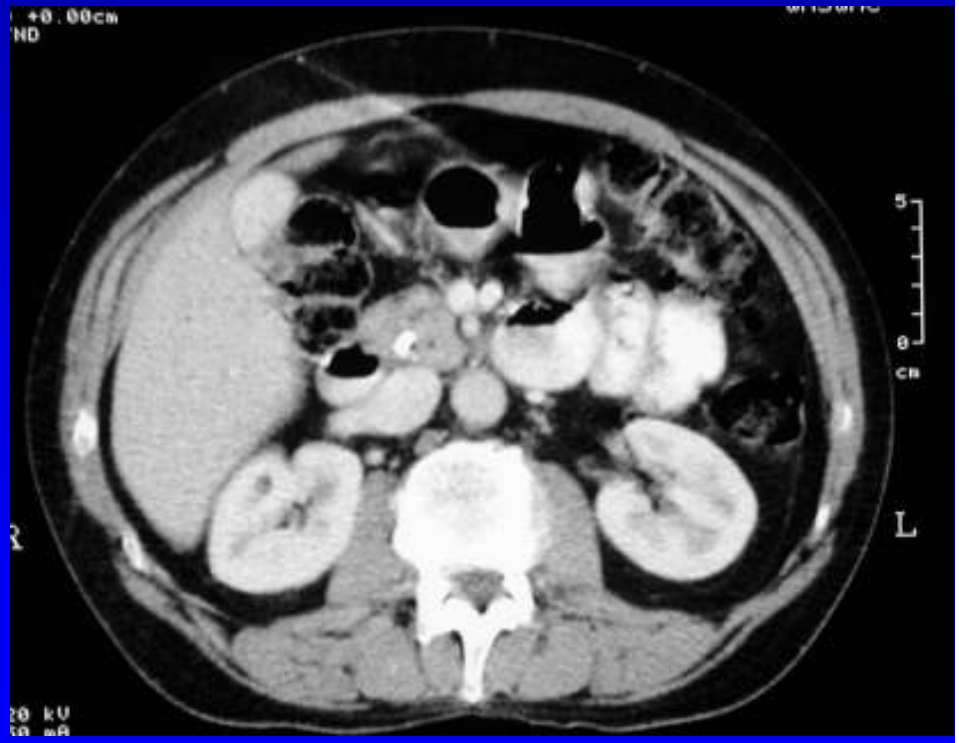
Cannulated Papilla



Normal Pancreatogram

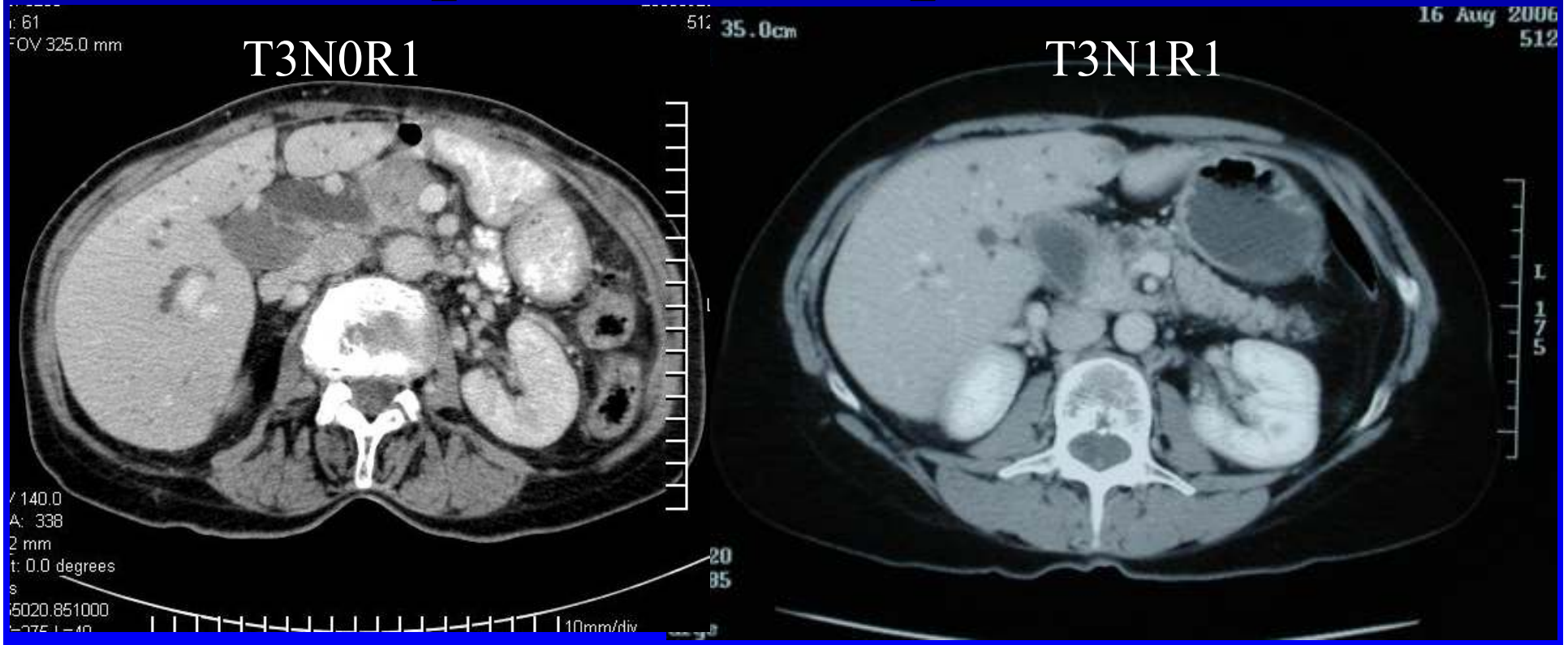
Vascular Assessment: Triple Phase, Spiral CT





Clearly operable tumours in head of pancreas

Vascular Assessment: Triple Phase, Spiral CT

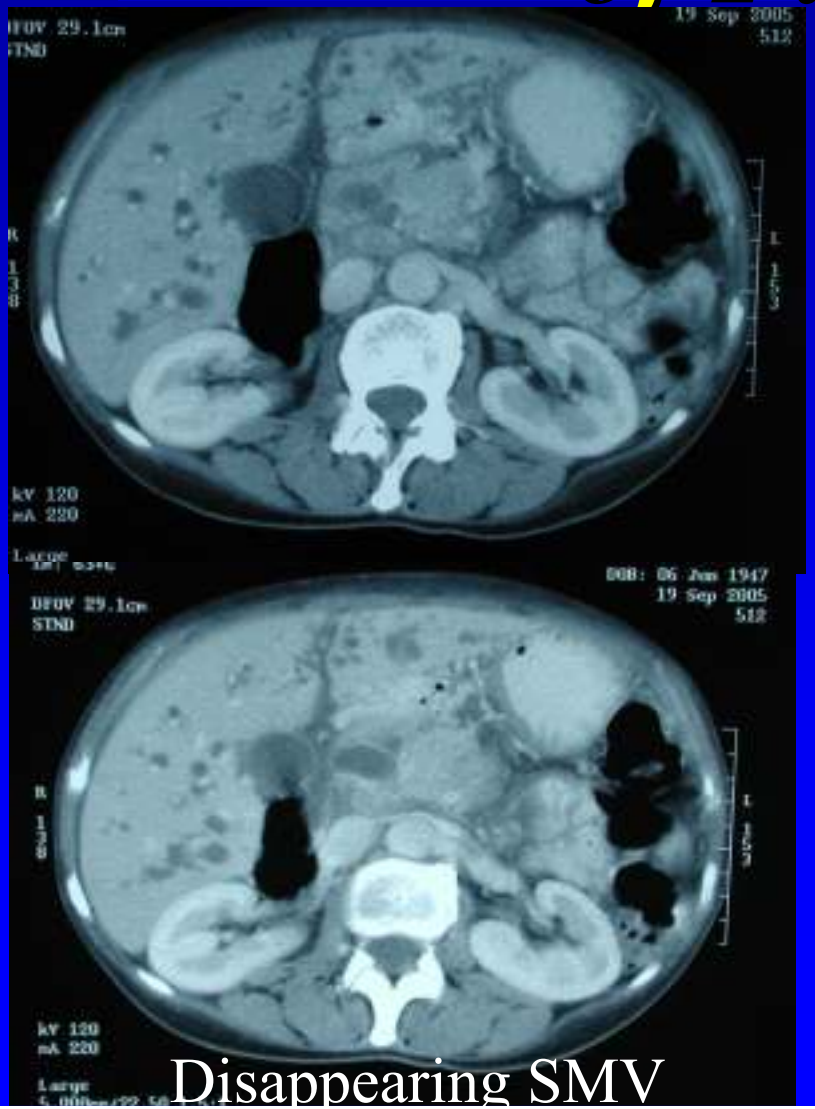


Operable adenocarcinoma pancreas but tethered to PV/SMV

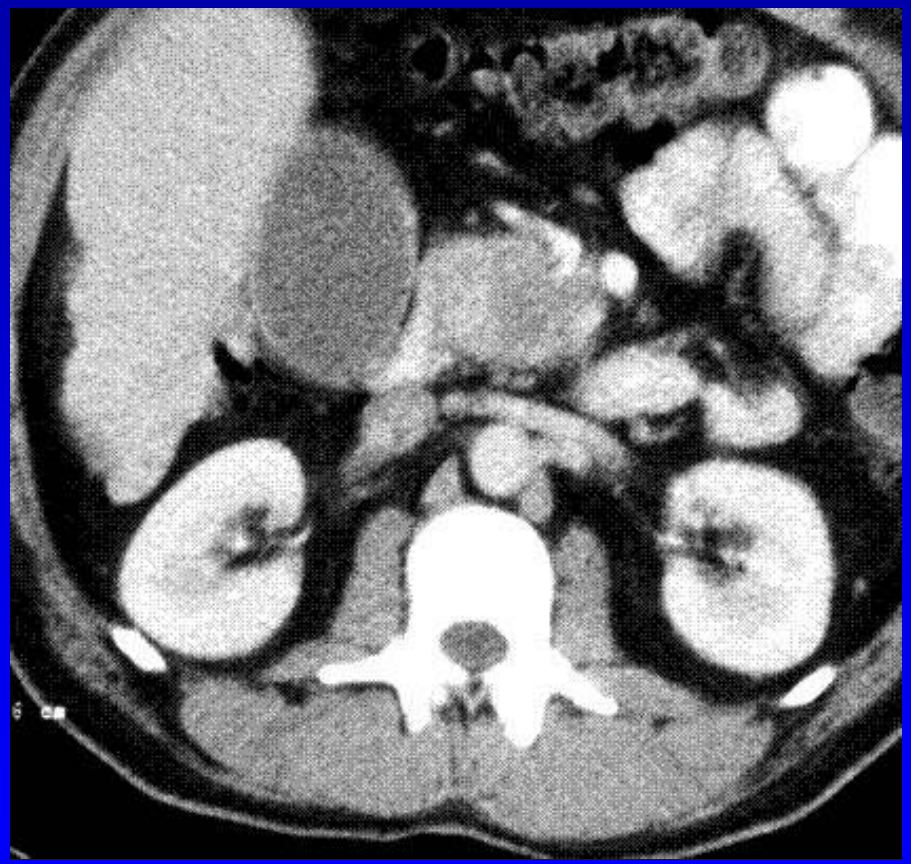
Operable adenocarcinoma pancreas but required full circumferential SMV resection

NB: tongue of tethered SMV

Inoperable Tumours in Head of Pancreas



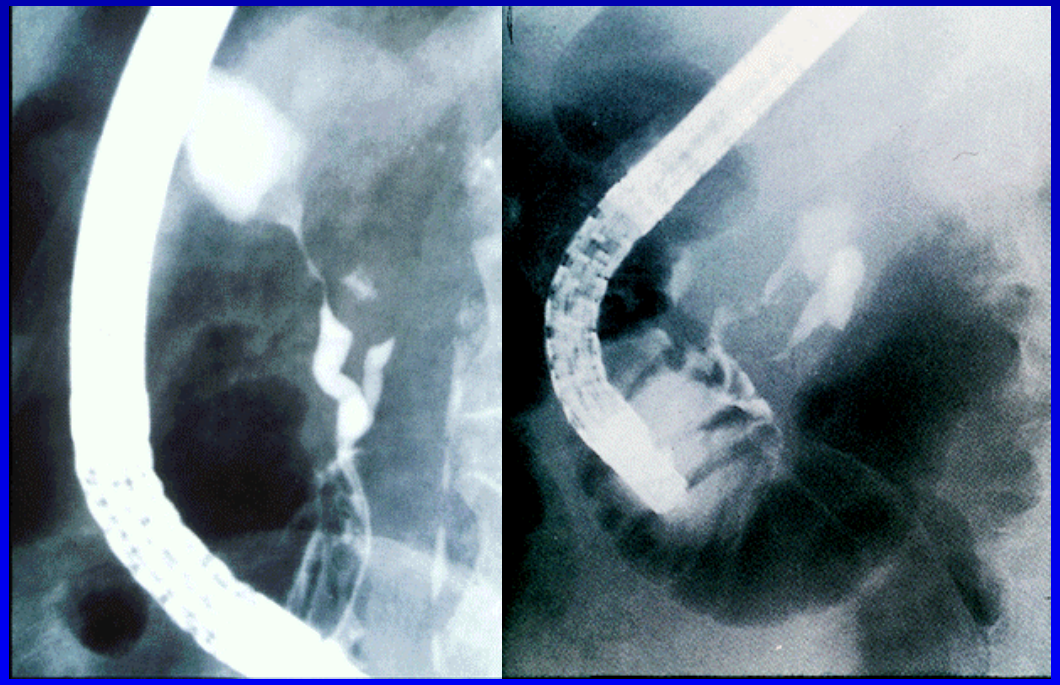
Disappearing SMV



Venous invasion

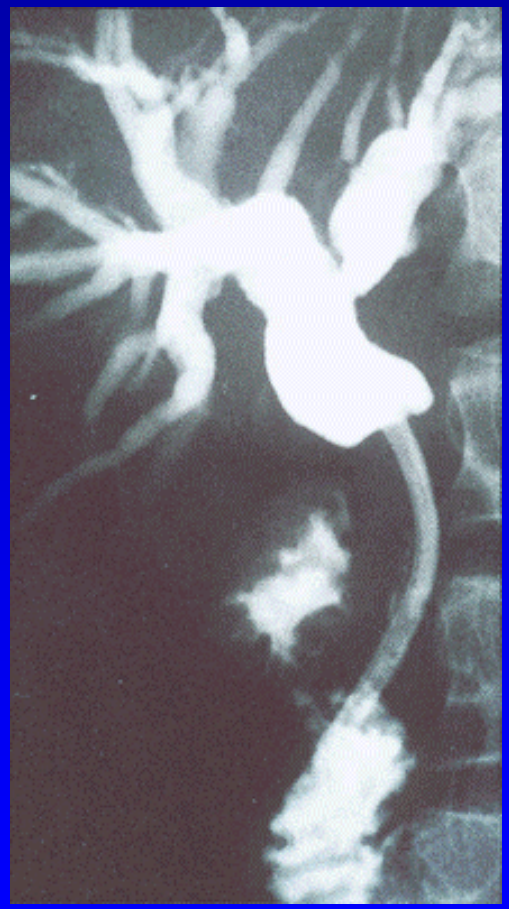
& tumour up to SMA

Therapeutic ERCP



Bile & Pancreatic Duct Obstruction

'Double Duct' Sign



Stented Common Bile Duct During ERCP

Resection Rates from National Figures, Single Centres & Hospital Specialists

Japan: Japanese Pancreatic Society n=8710 (Tsuchiya et al 1990)

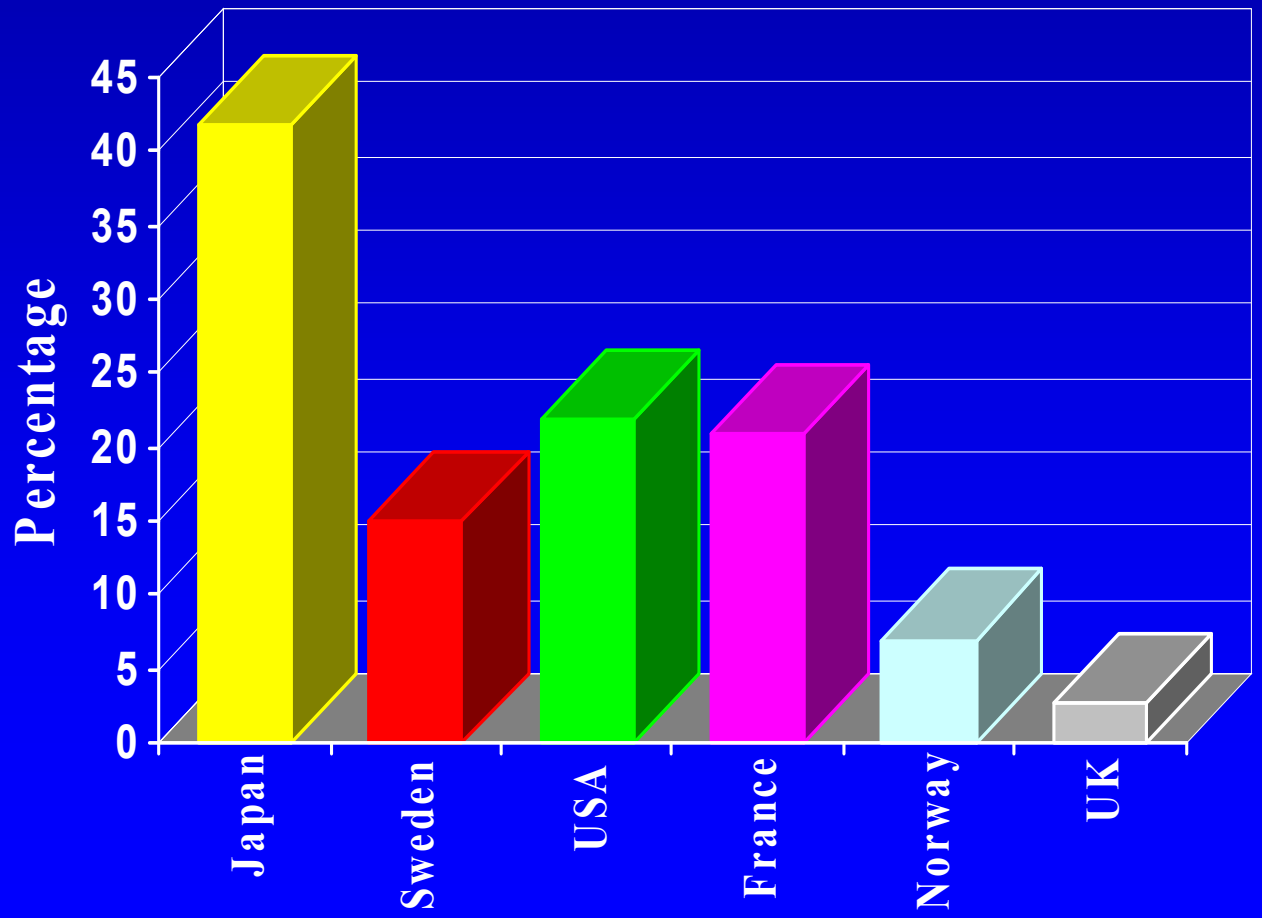
Sweden: Department of Surgery, Lund n=738 (Andren-Sandberg et al 1991)

USA: Department of Surgery, UCLA n=340 (Livingston et al 1991)

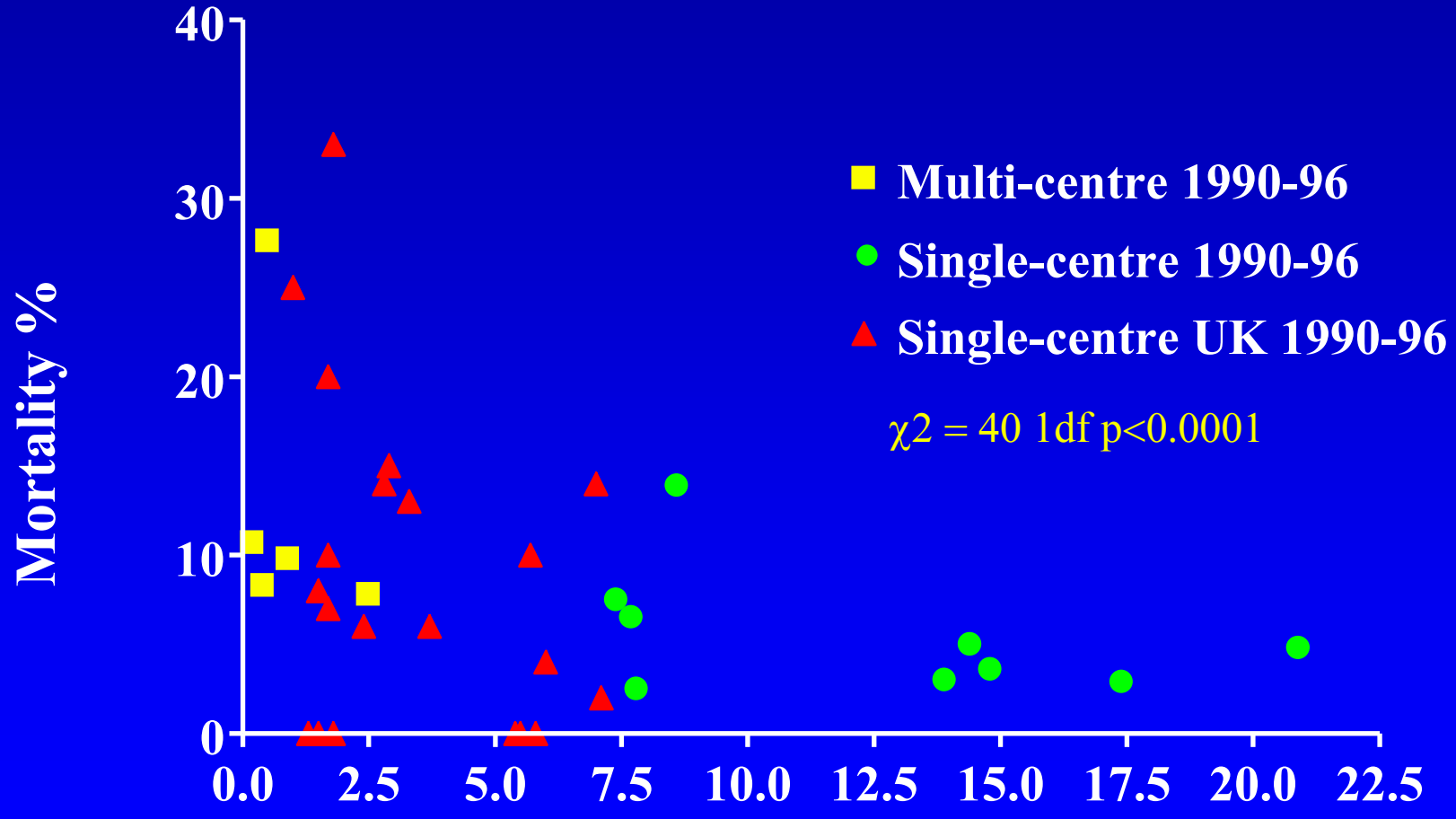
France: French Hospital Specialists n=3741 (Baumel et al 1994)

Norway: Cancer Registry 1980

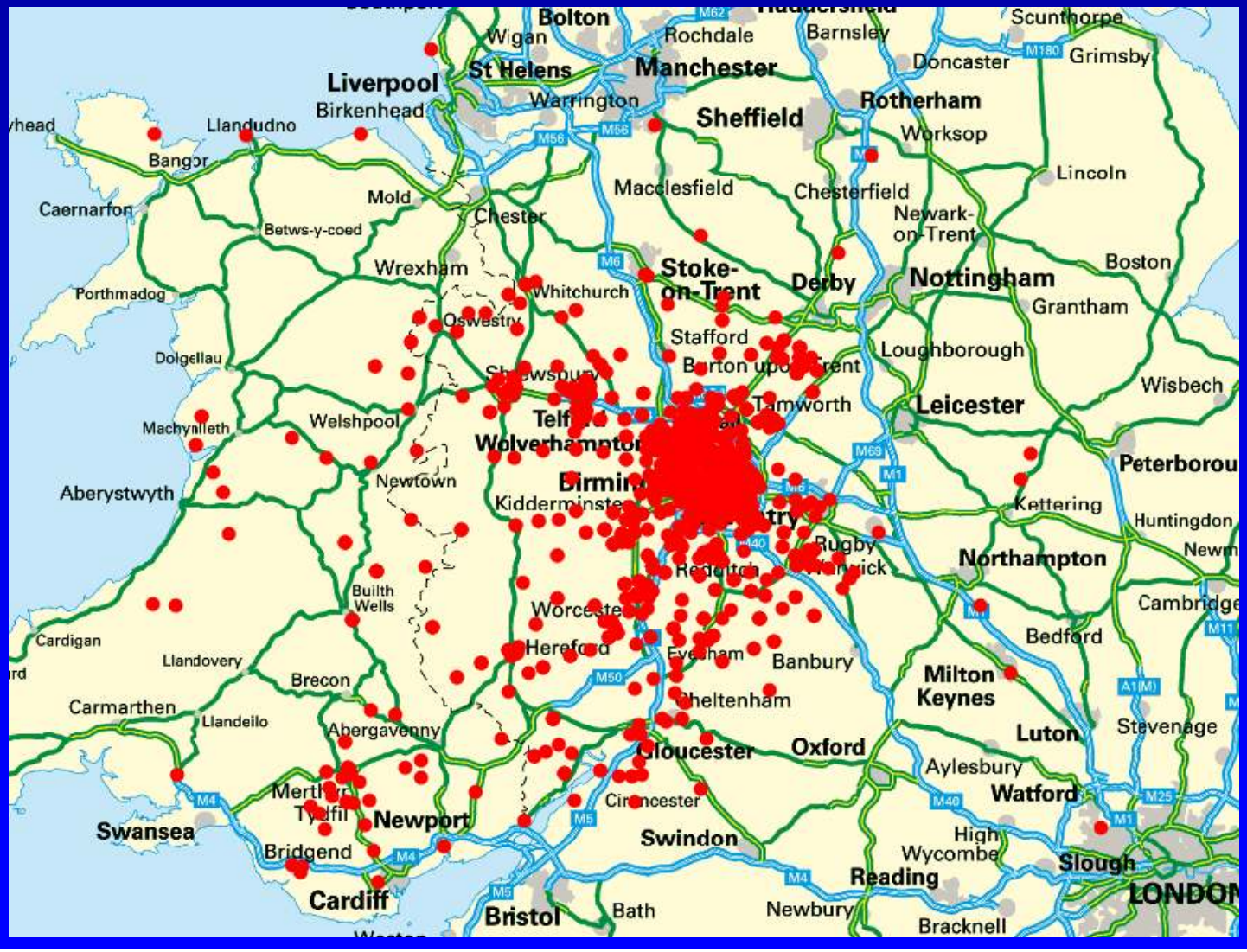
UK: West Midlands Cancer Registry n=13,560 (Bramhall et al 1995)



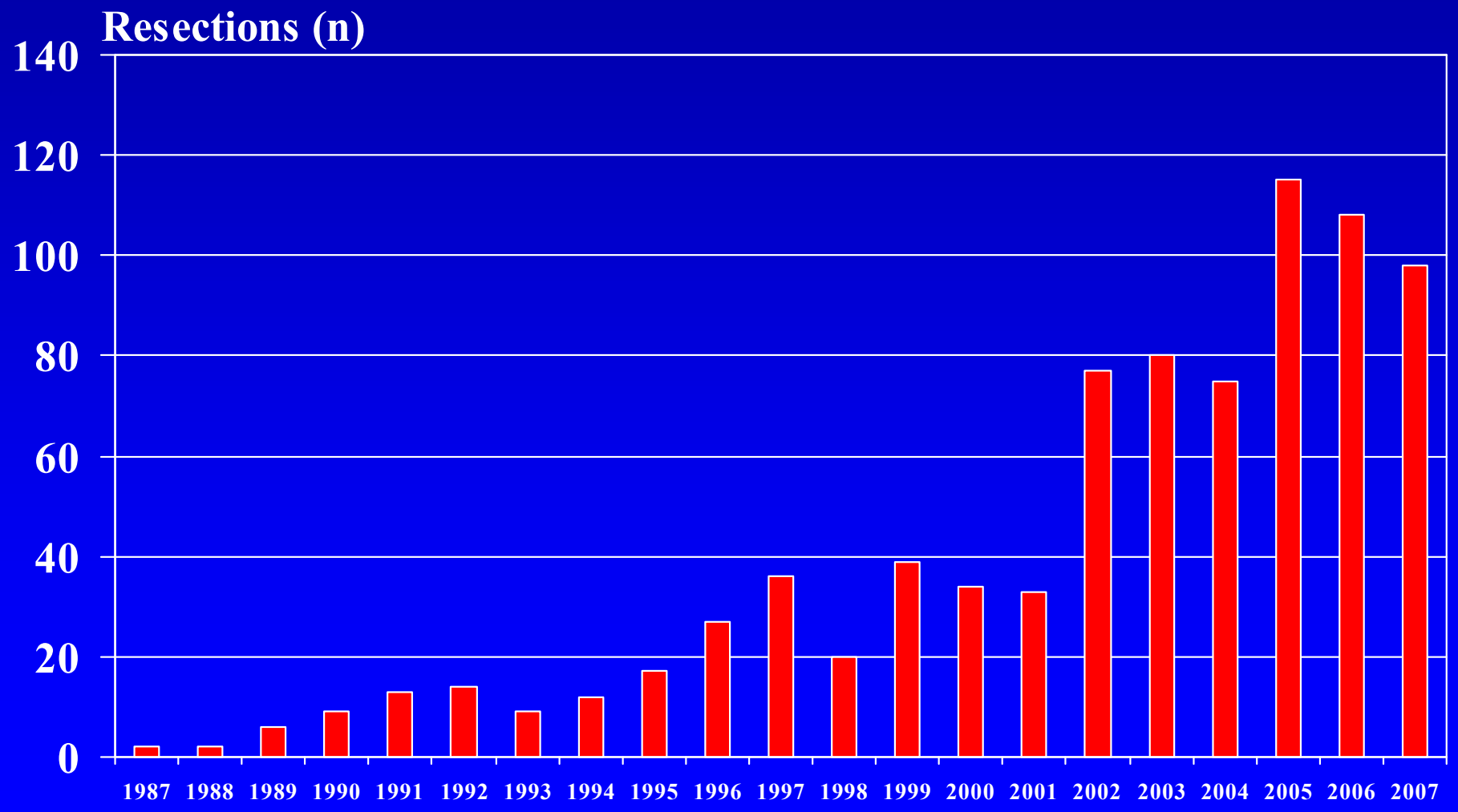
Operative Mortality vs Number of Resections Performed per Year

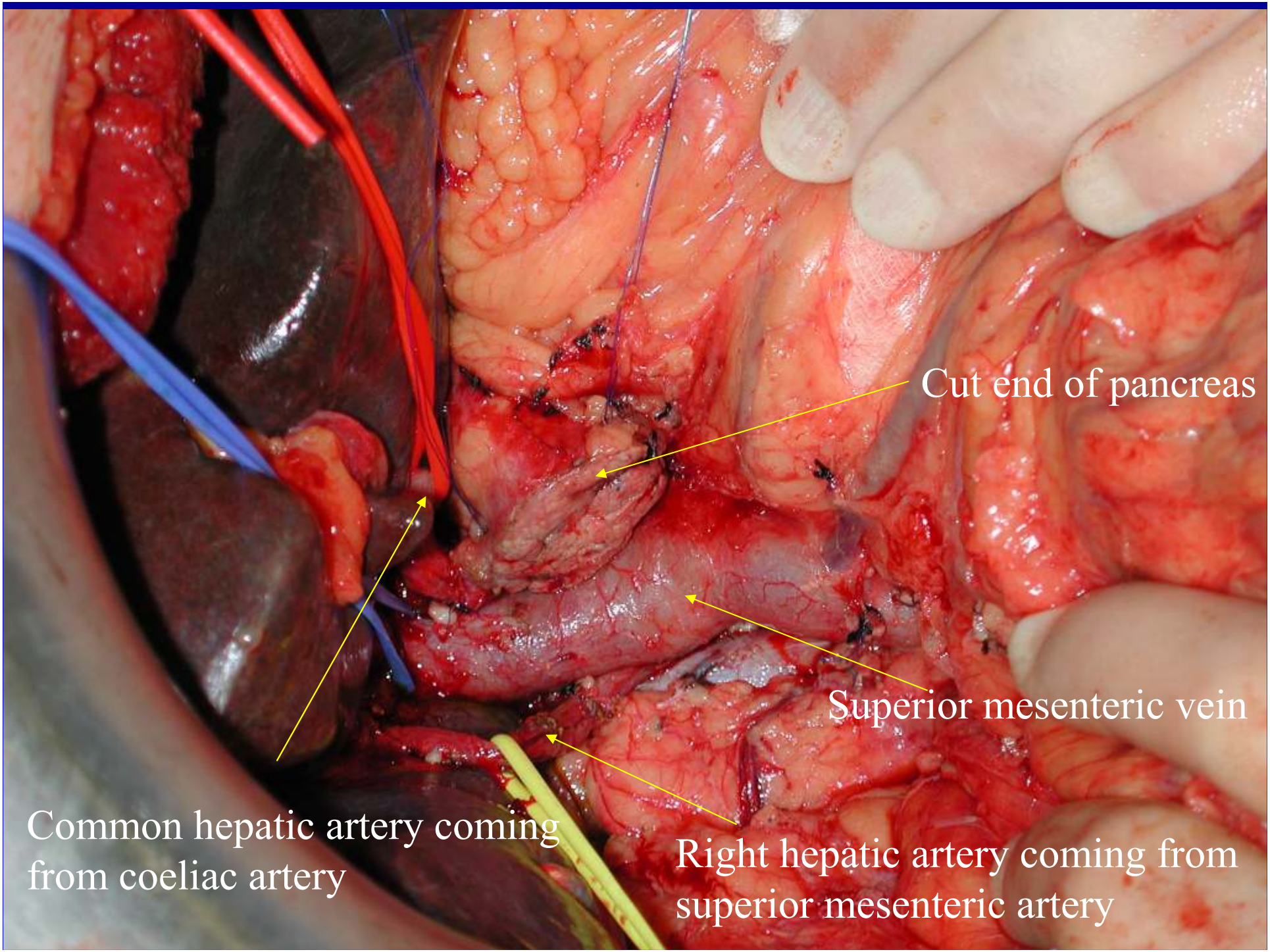


Referrals for Pancreatic Cancer 2000-2007

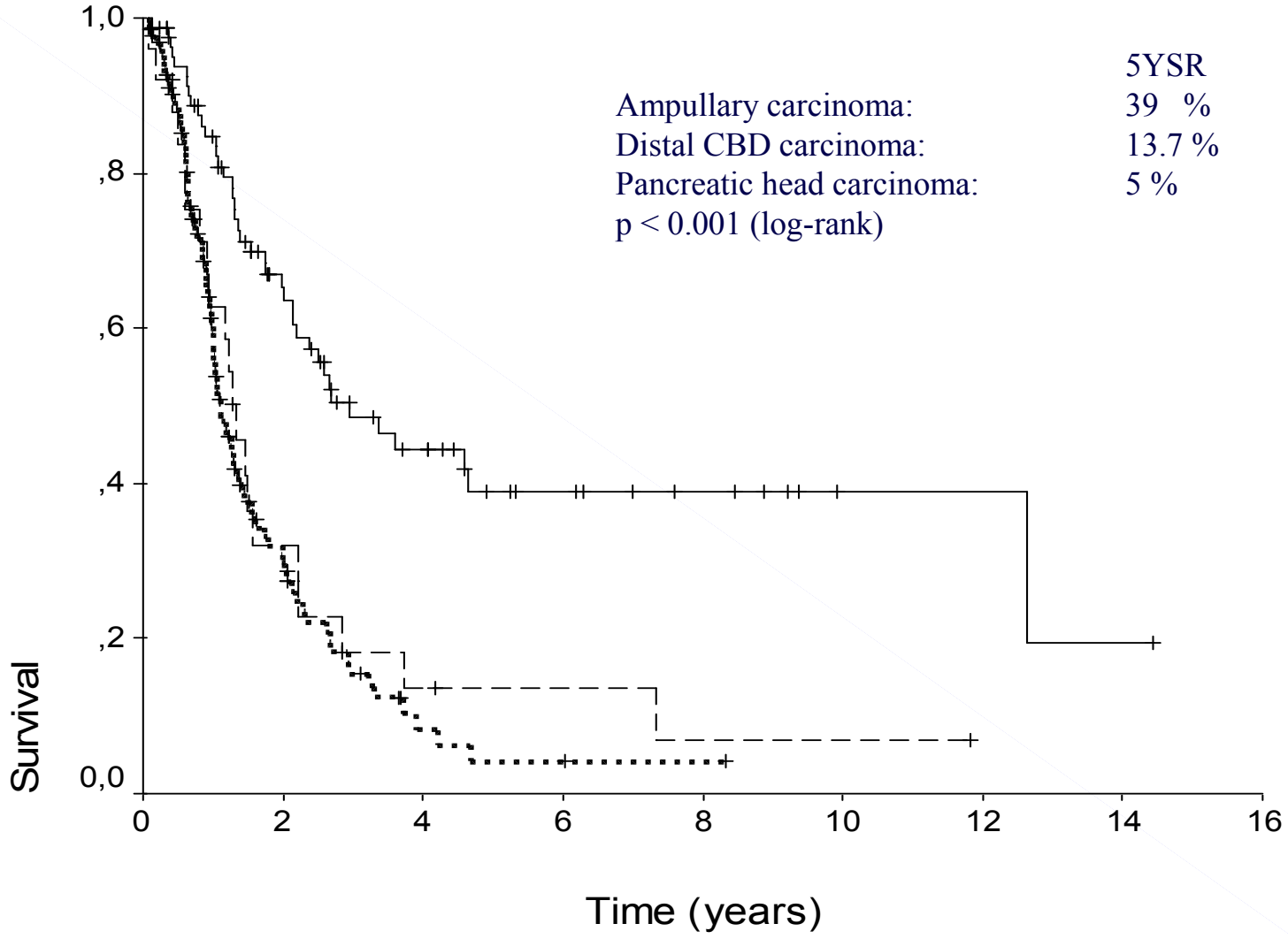


Number of Pancreatic Resections per Year (B'ham Liver Unit)

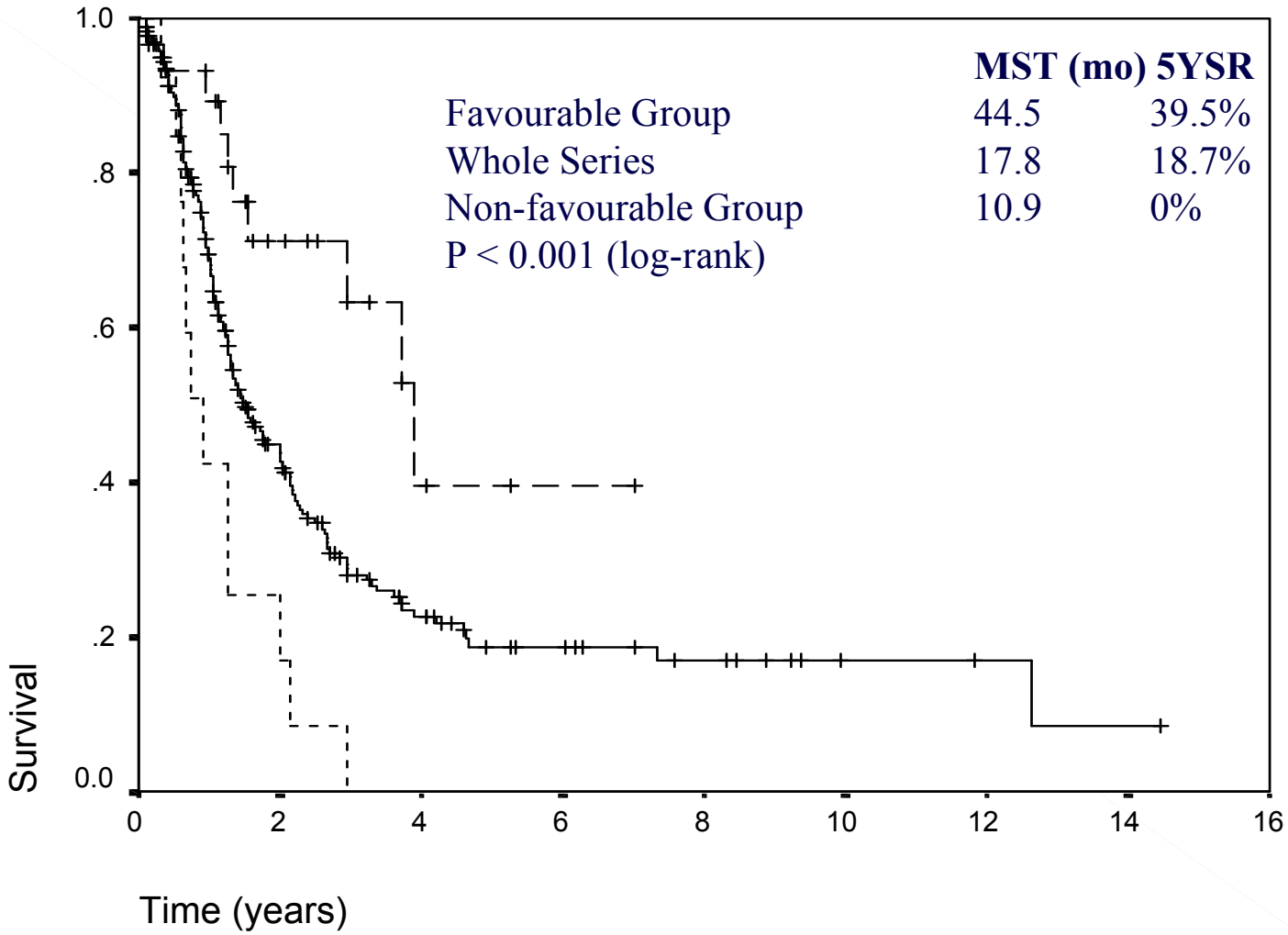



Cut end of pancreas
Superior mesenteric vein
Common hepatic artery coming from coeliac artery
Right hepatic artery coming from superior mesenteric artery

Survival Following Resection:
Periampullary & Pancreatic Carcinoma



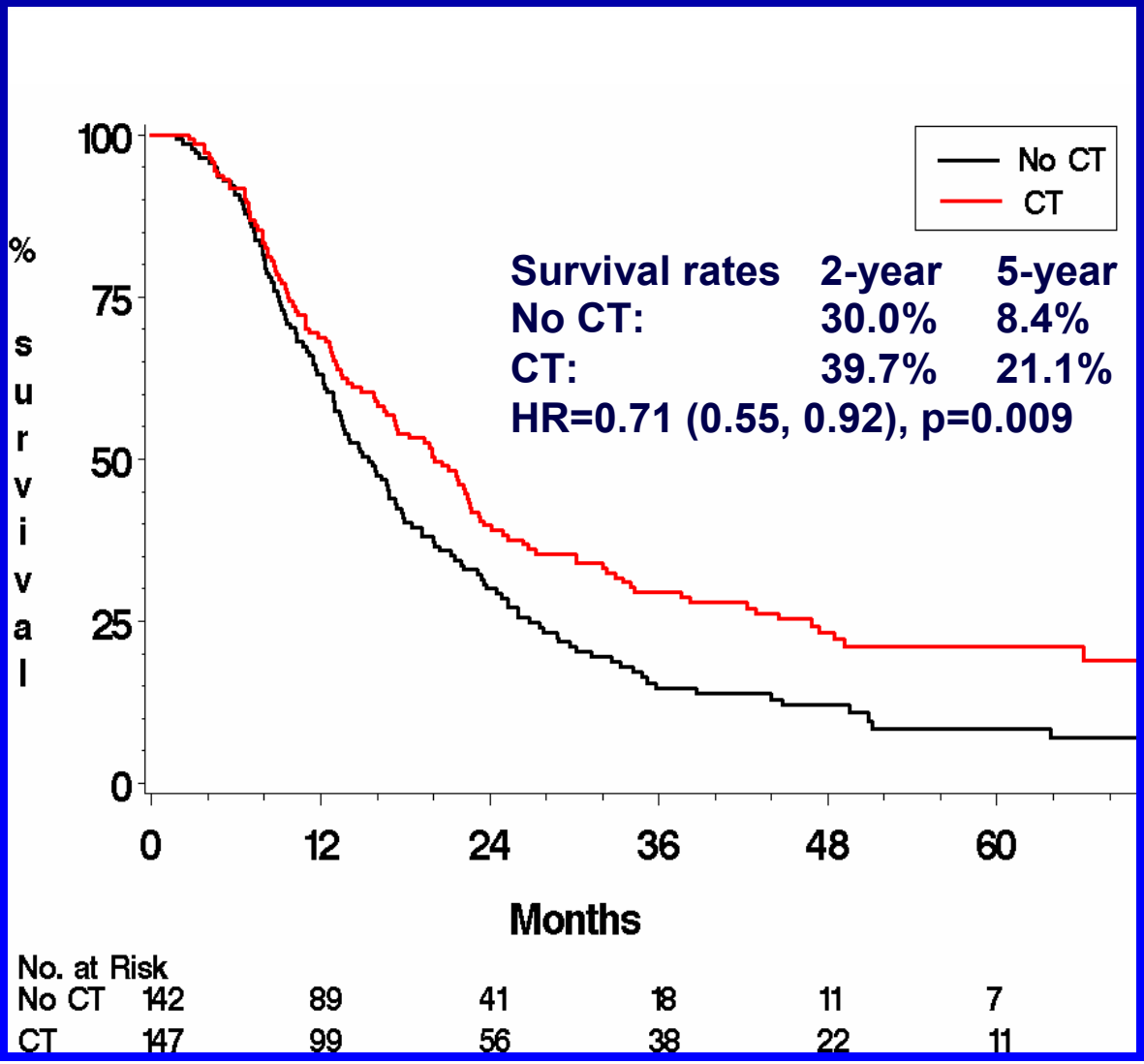
Survival Following Resection:
Favourable & Non-Favourable Predictors



Favourable factors:
R0
LN-ve
well/mod diffn

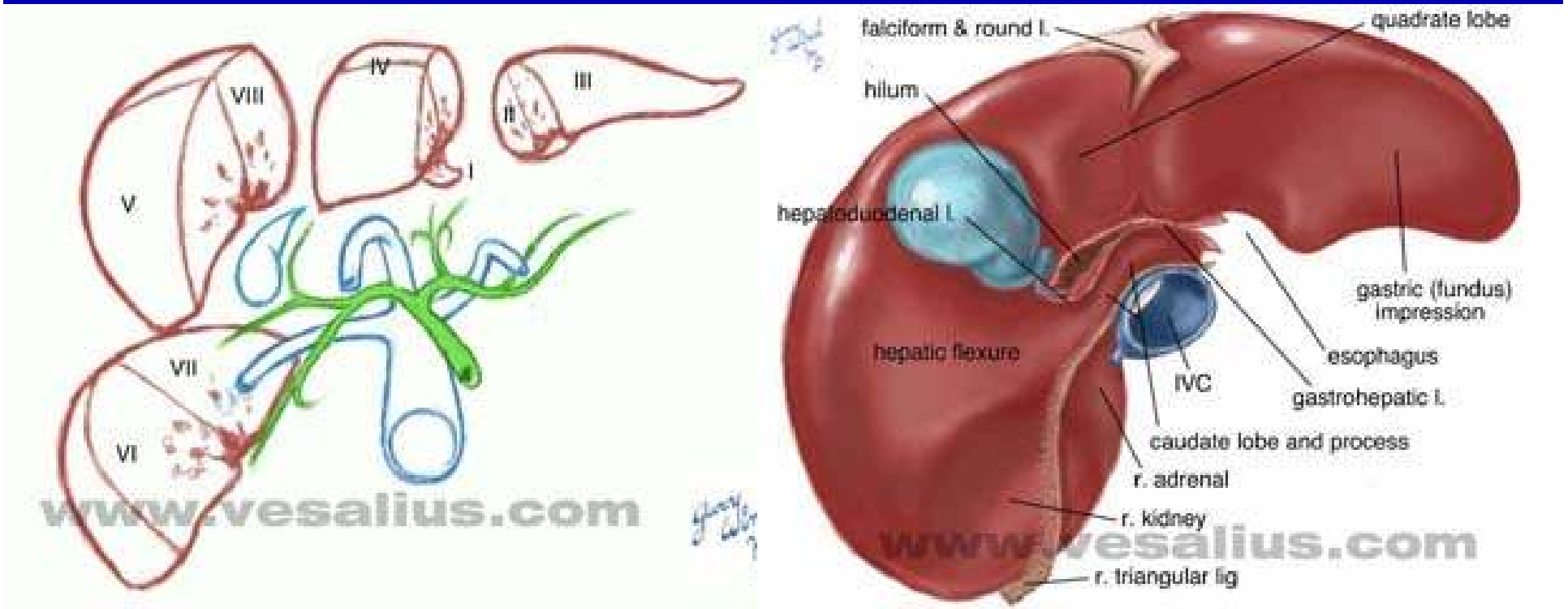
Non-favourable factors:
R1
LN+ve
poor diffn

ESPAC-1: 2x2 Survival by CT



Liver Metastases or Liver Secondaries

The Liver

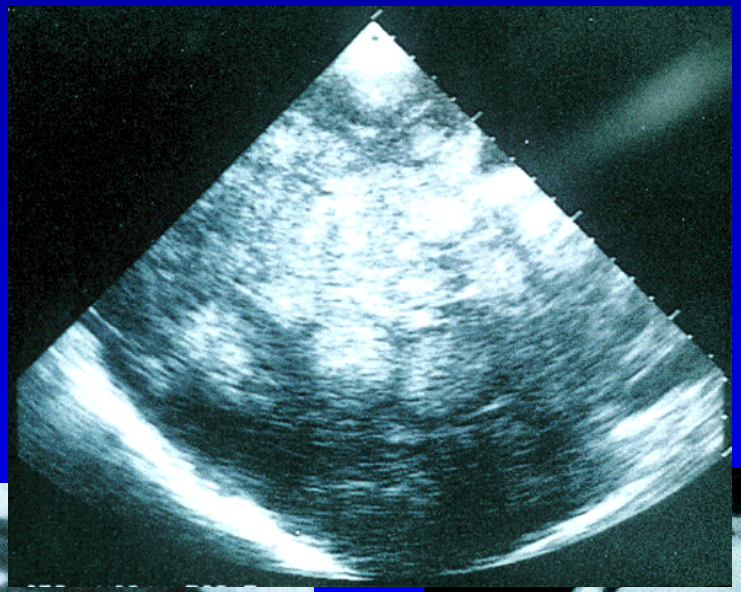


Left lobe = segments I, II, III, IV

Right Lobe = segments V, VI, VII, VIII

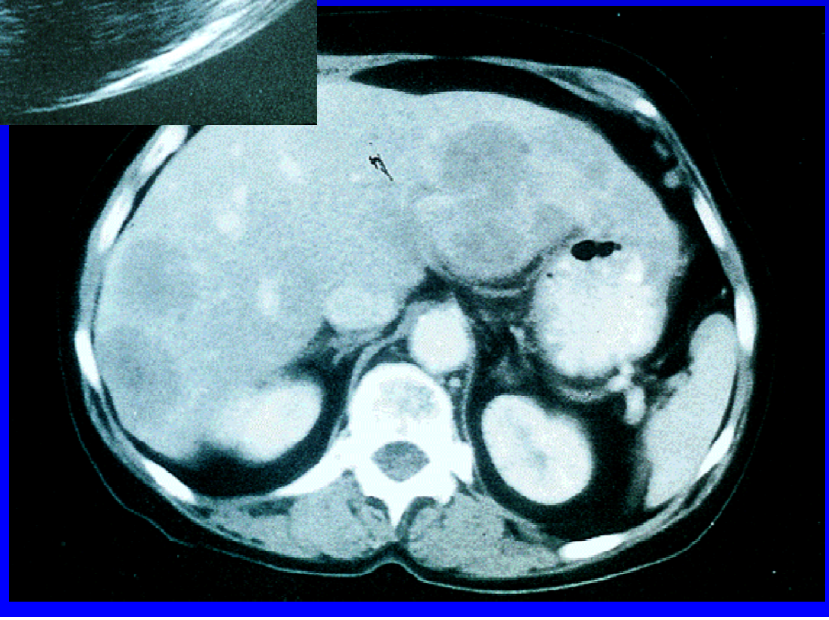
Hepatic Metastases

Ultra-Sound Scan



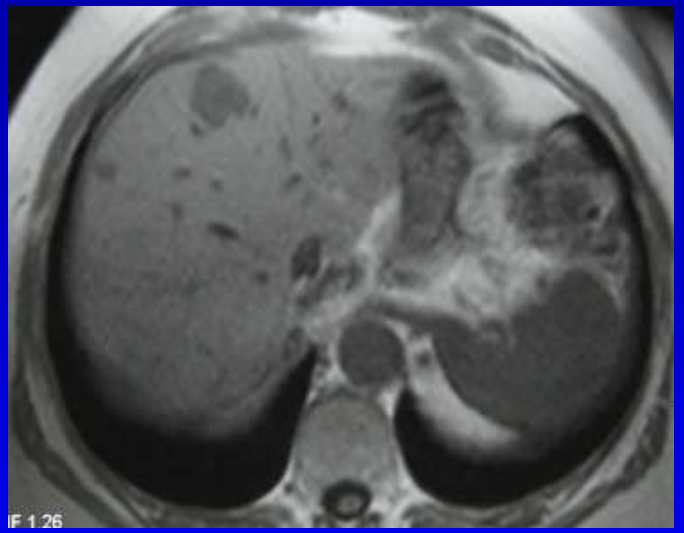
MRI Scan

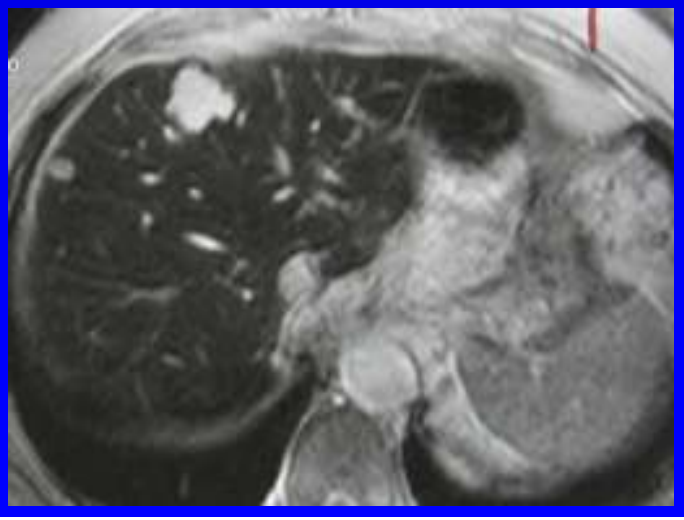
CT Scan



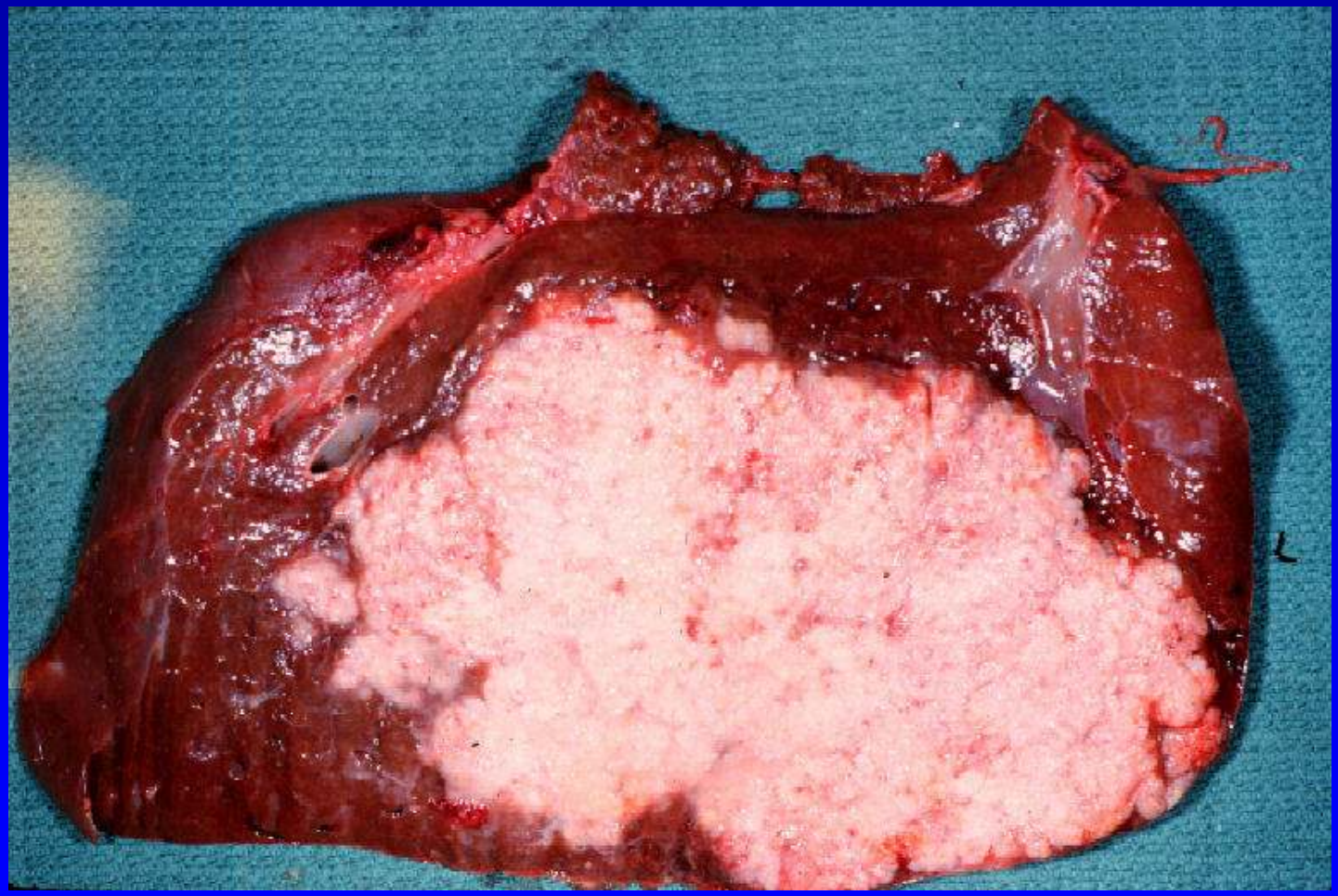
MRI with SPIO: Resovist (ferucarbotran)

- Named patient basis only
- Investigation of liver lesions
- Use for possible metastases pre surgery when synchronous &/or chemo has altered the liver
- ?HCC in cirrhosis



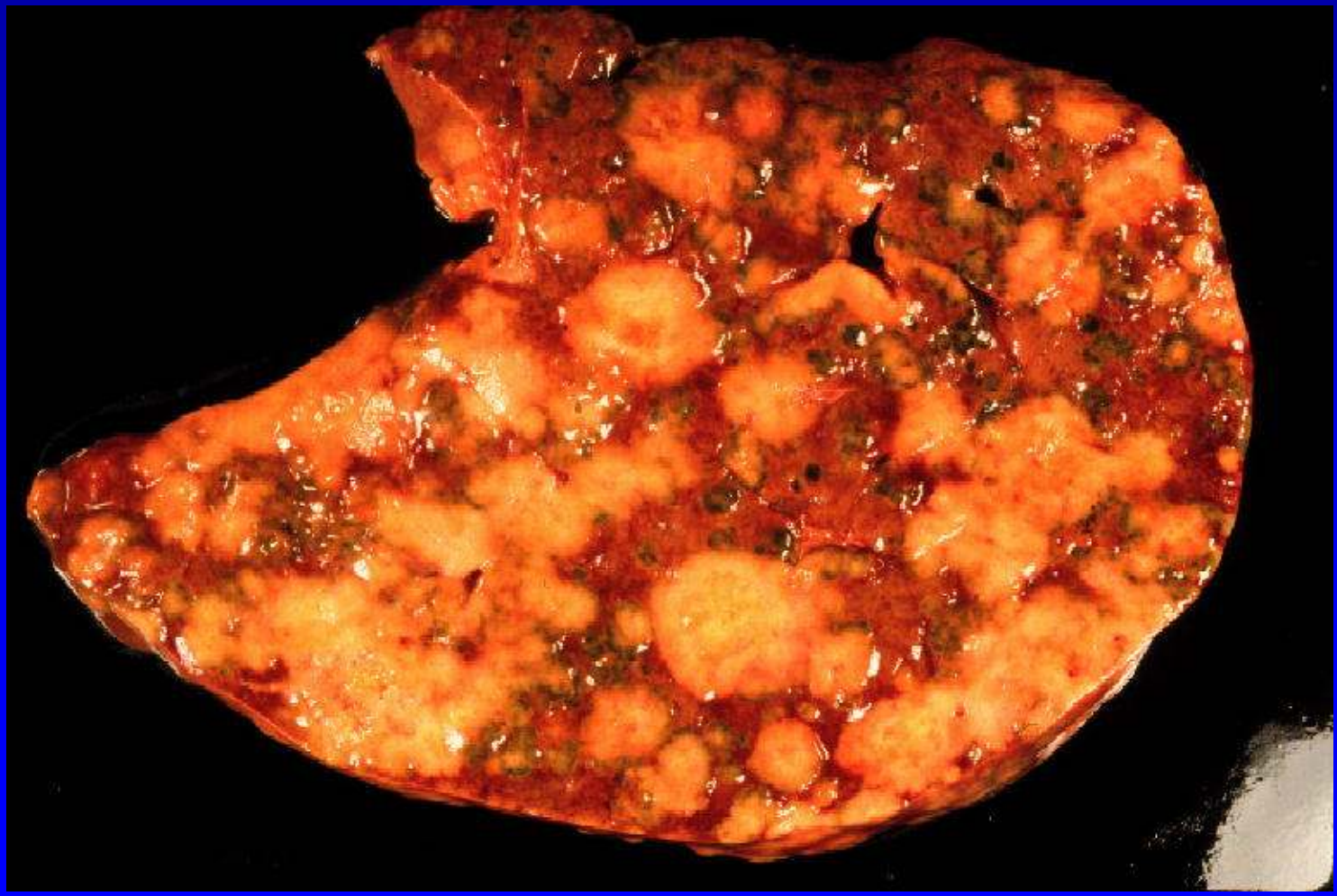


Resectable Hepatic Metastasis



Specimen from liver resection for single CRC metastasis to liver

Multiple Hepatic Metastases

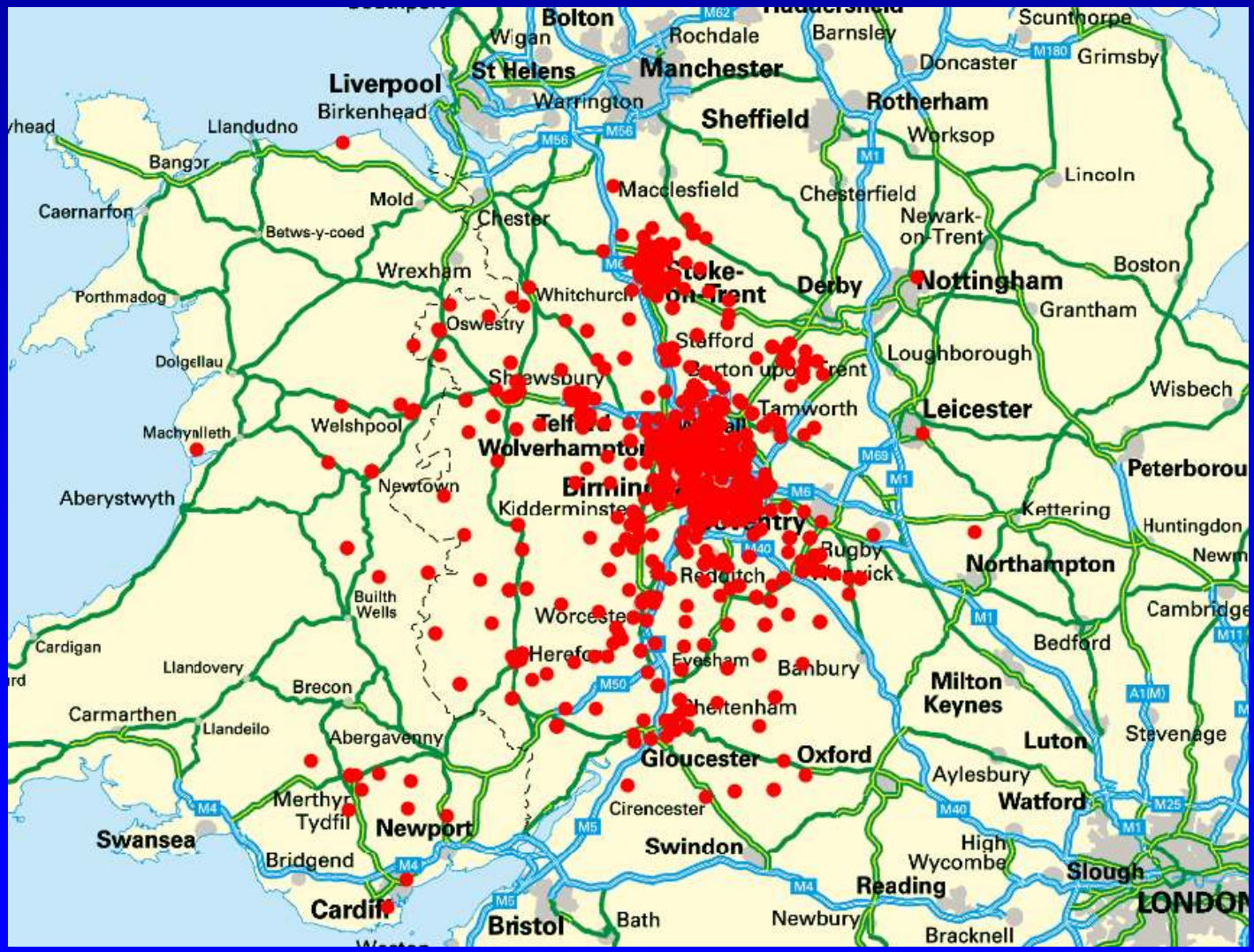


Multiple CRC metastasis to liver

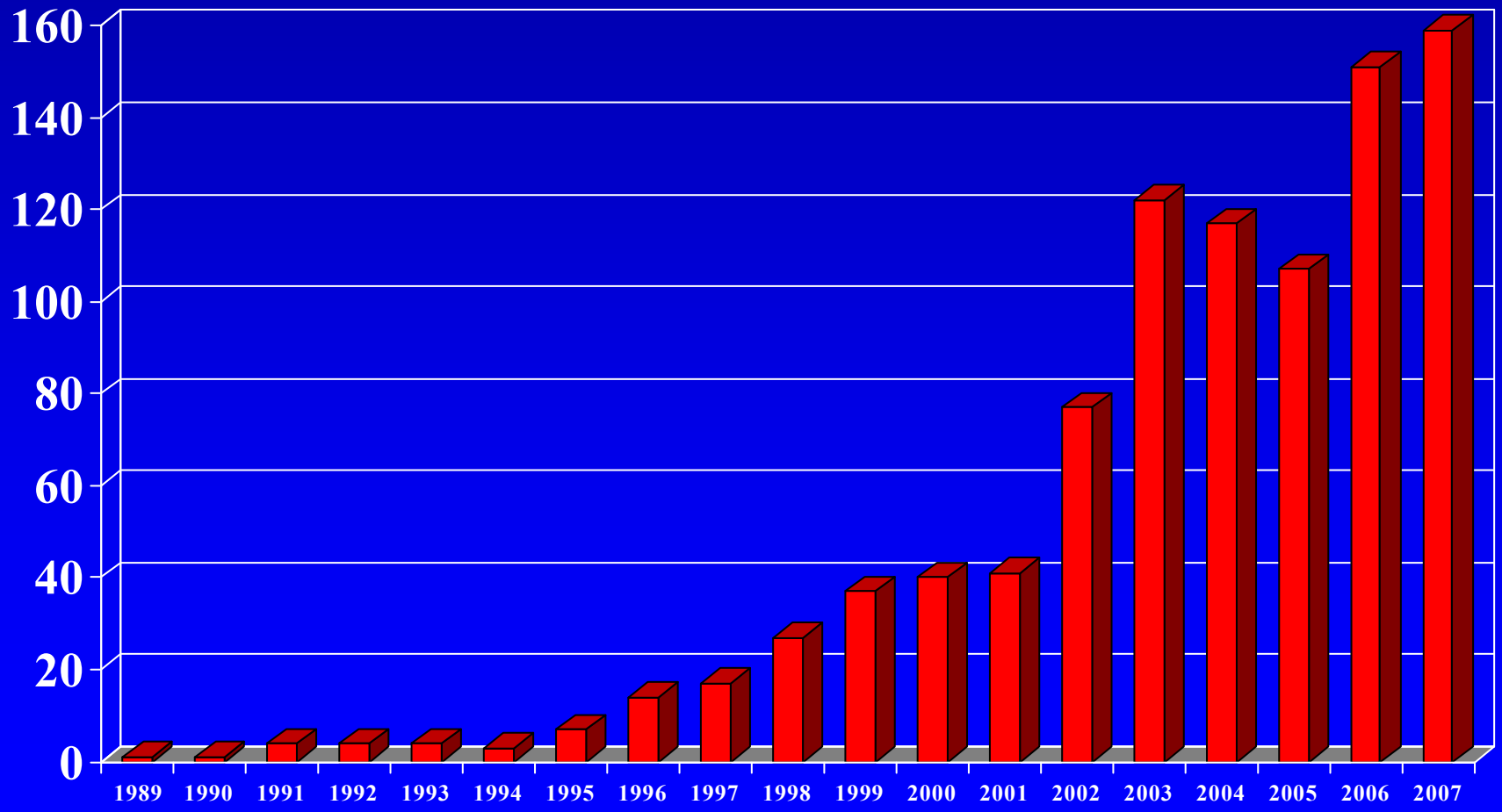
Incidence of Resectable Colorectal Liver Metastases

- 28,000 patients with CRC per year in UK
- > 18,000 die within 5 years
- 20 - 25 percent liver metastases at presentation
- further 40 percent will develop metastases
- overall 60 - 65 percent with liver metastases
- 20% liver first or only site of recurrence (>5000)
- If 1/3rd fit and operable - > 1500 per year in UK
- > 25 per million per year

Referrals for Colorectal Cancer Liver Metastases 2000-2007



Number of Resections for Colorectal Metastases Per Year



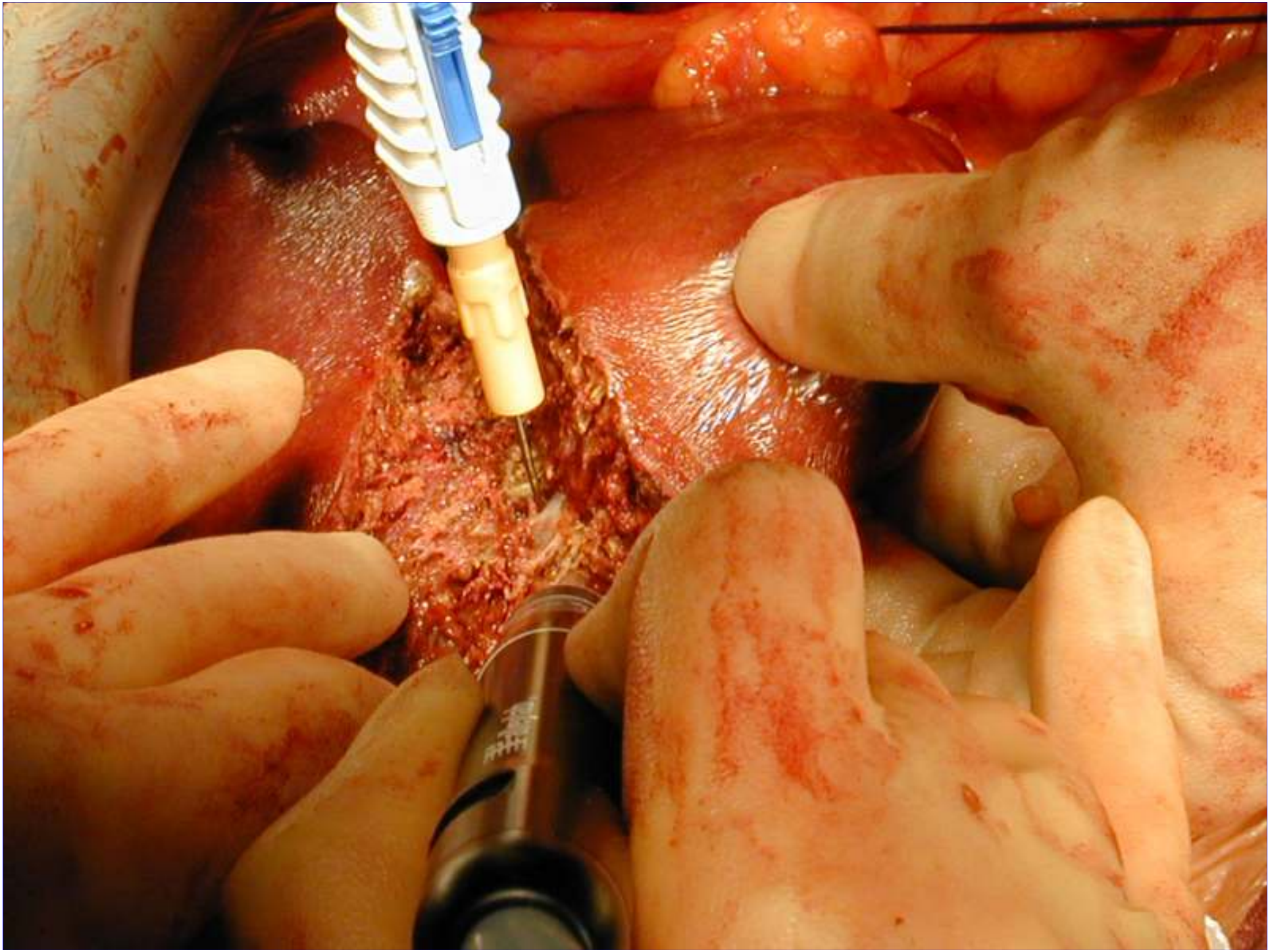
Birmingham 2003

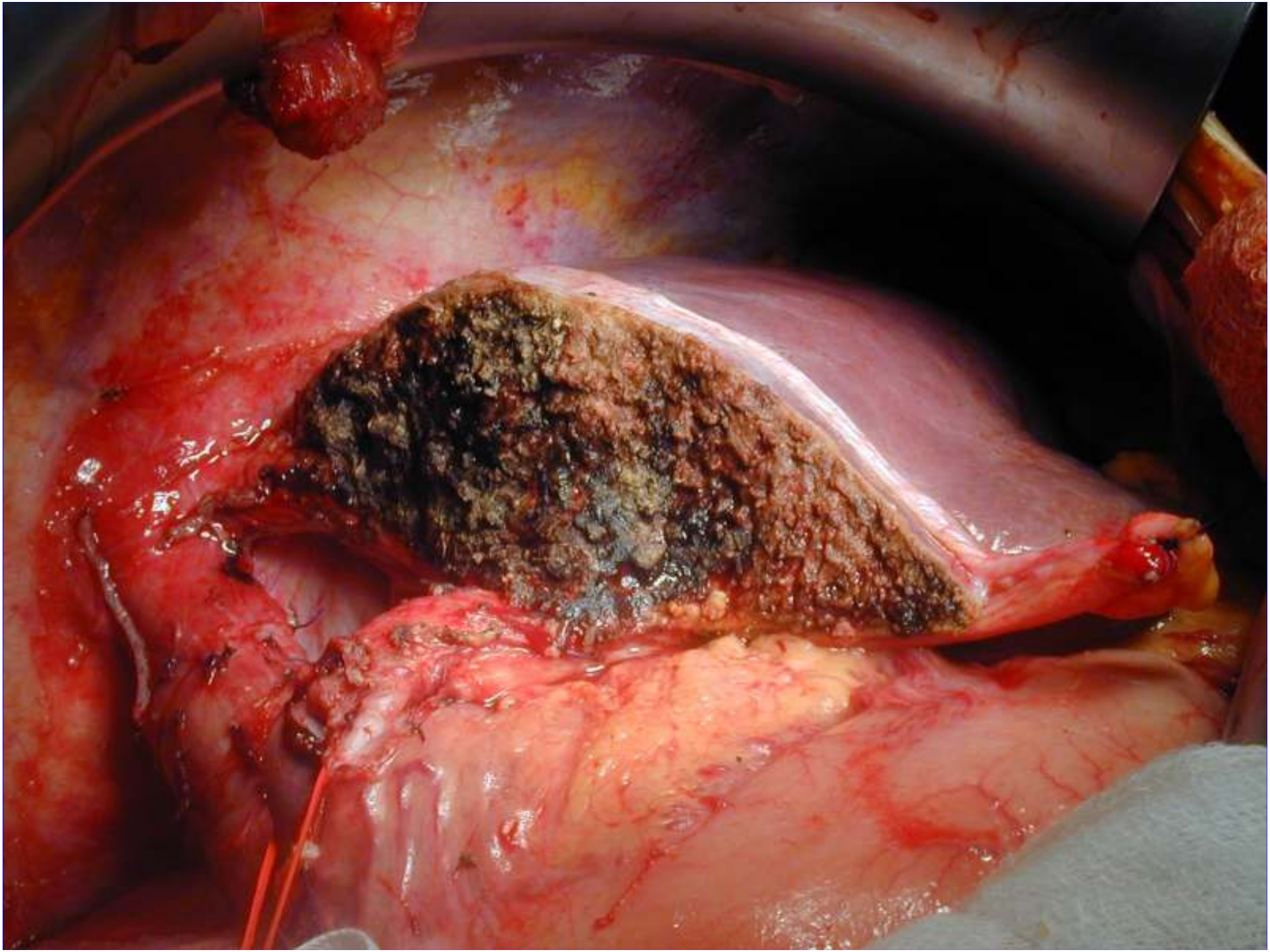
How Should Patients be Screened for CRC Liver Metastases?

- Lack of guidelines for screening (rated B by RCSE/ACP) – recommended perioperative CT scan only
- Lack of evidence of cost effectiveness
- Recent BSG – further CT scan by 12 months
- ? scans between 18 and 24 months

Hepatic Metastasis - Treatment

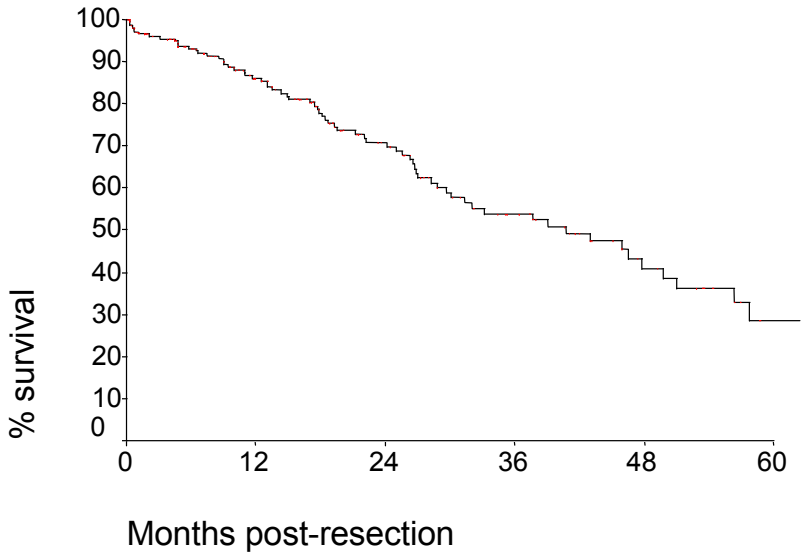
- Multi-focal disease - not amenable to surgical resection
- <4 metastases &/or confined to 1 lobe, no extra-hepatic disease, fit for major surgery - liver resection
  - hemihepatectomy (L or R)
  - extended hemihepatectomy
  - segmental resection or non-anatomical resection
- Reported 5YSR 30-40%
- Possible prognostic factors:
  - number & size of metastases,
  - resection margin clearance
  - synchronous vs. metachronous metastases



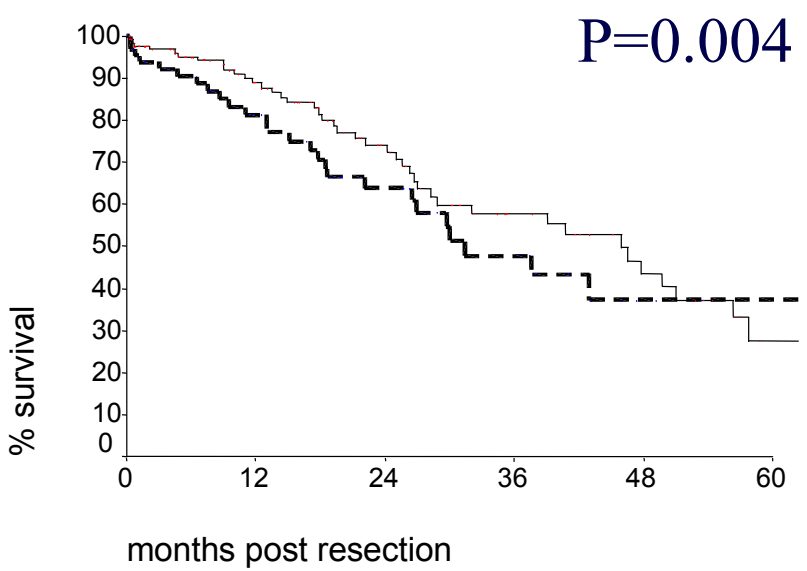


Birmingham Experience of Liver Resection for CRC Metastases

Peri-operative mortality = 2.8%



Overall Survival



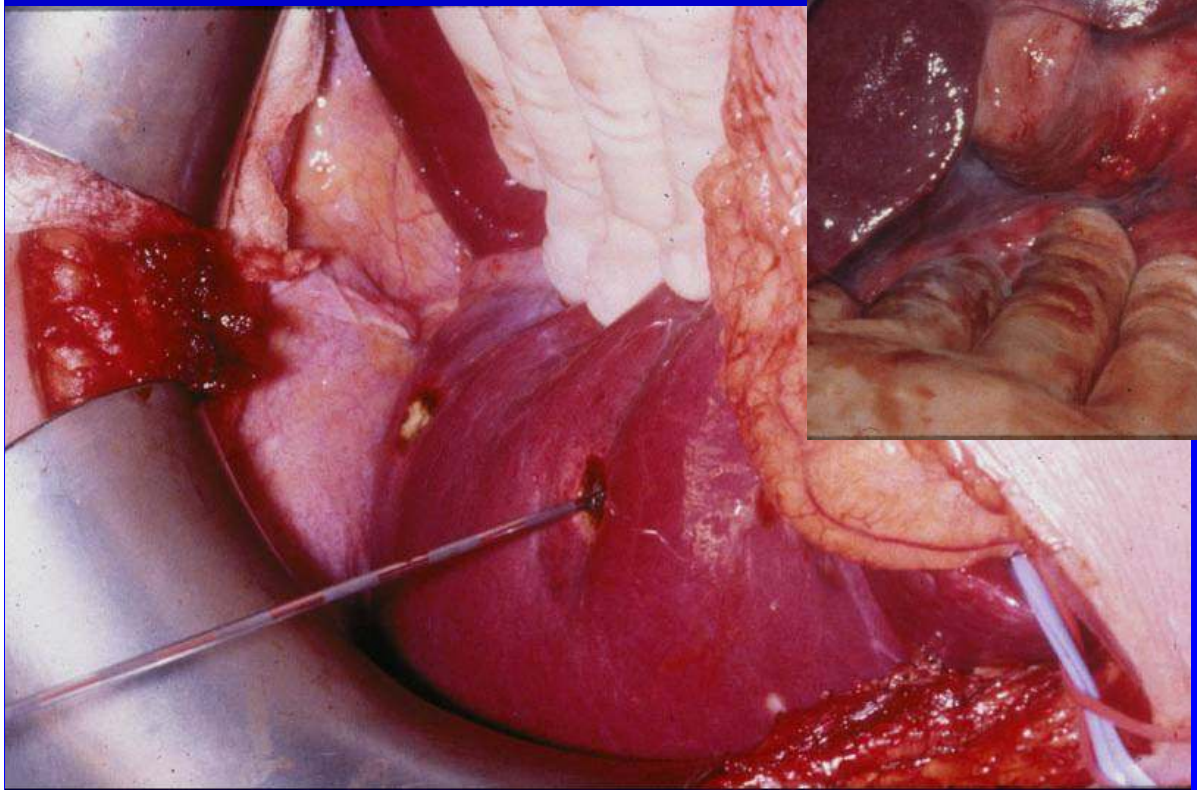
Survival in patients with lesions <5cm vs >5cm

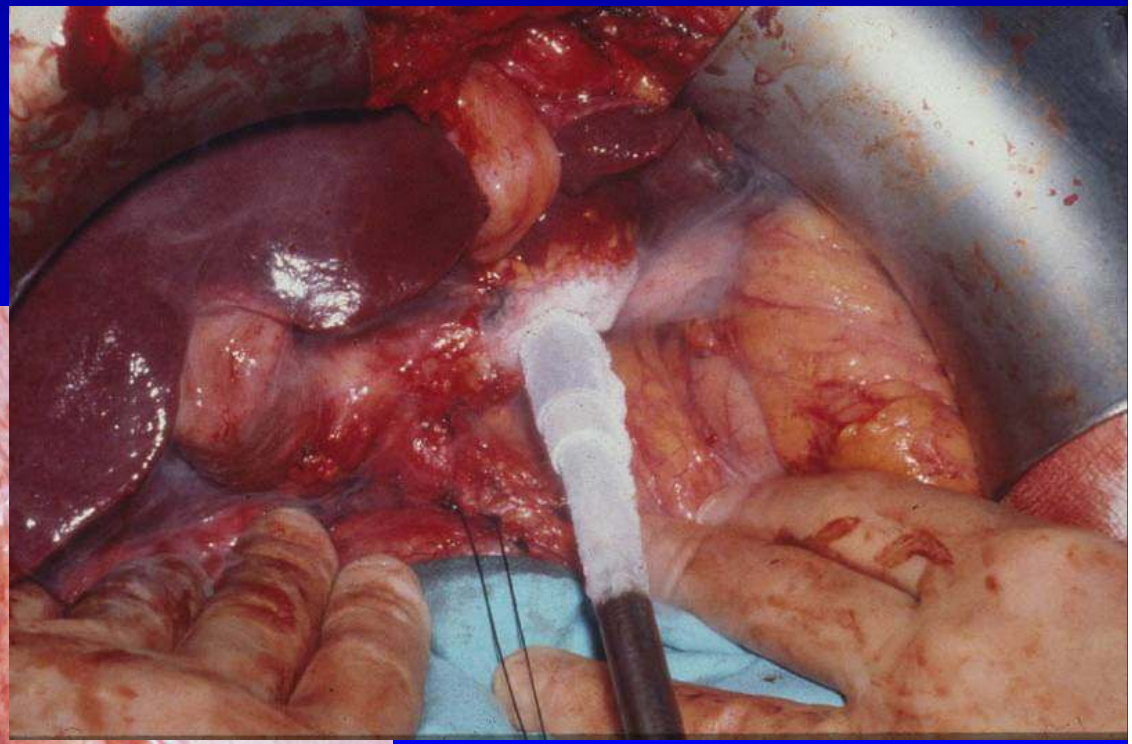
Hepatic Metastasis - Treatment 2

- Irradiation of liver
  - rarely used since tumouricidal doses also hepatotoxic
- Systemic chemotherapy
  - problems of first pass metabolism & bulky disease
  - objective response ≈25% with single & dual agents
- Hepatic artery chemotherapy
  - higher dose
  - design treatment protocol to give systemic ‘spill over’
  - drawbacks - operation, catheter sepsis, catheter blocking
- Other therapy
  - cryotherapy
  - alcohol injection

Cyto-Reduction

Radio Frequency Ablation





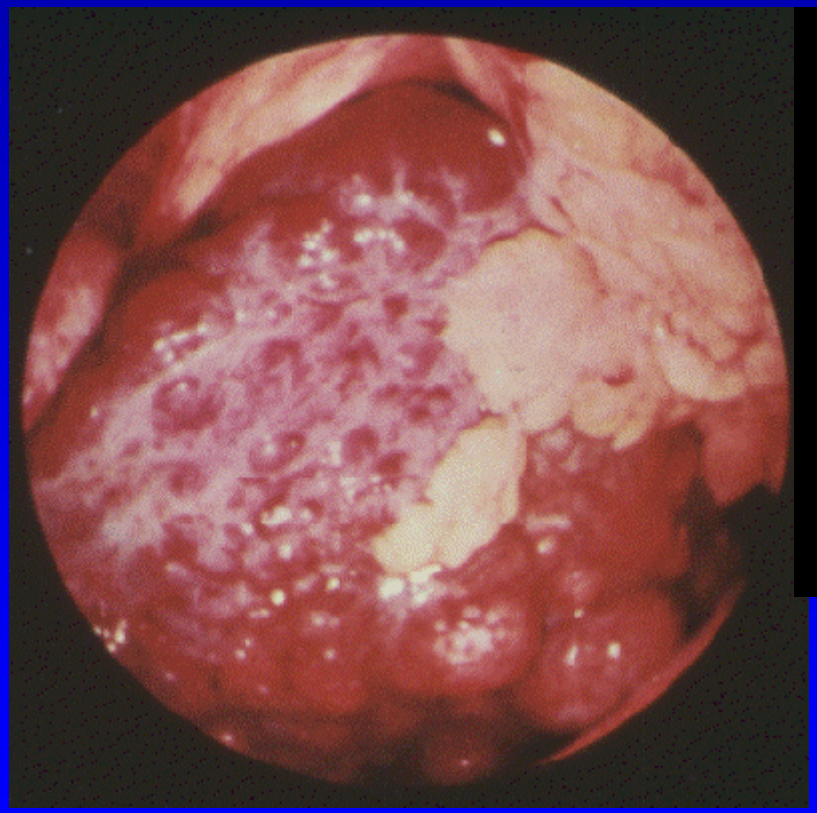
Cryoablation

Surgery for Other Metastases

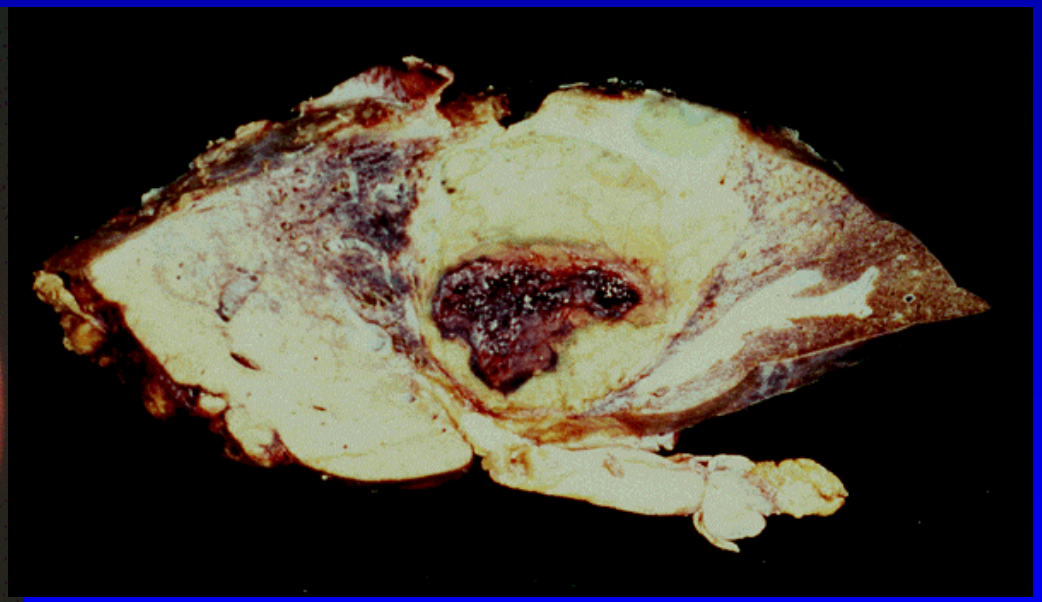
- Renal cell carcinoma
- ??? Breast Carcinoma
- GIST
- Non-GIST sarcomata
- Neuroendocrine
- ? Carcinoid
- Low grade ovarian tumours

Primary Liver Cancer

Hepatocellular Carcinoma (HCC)

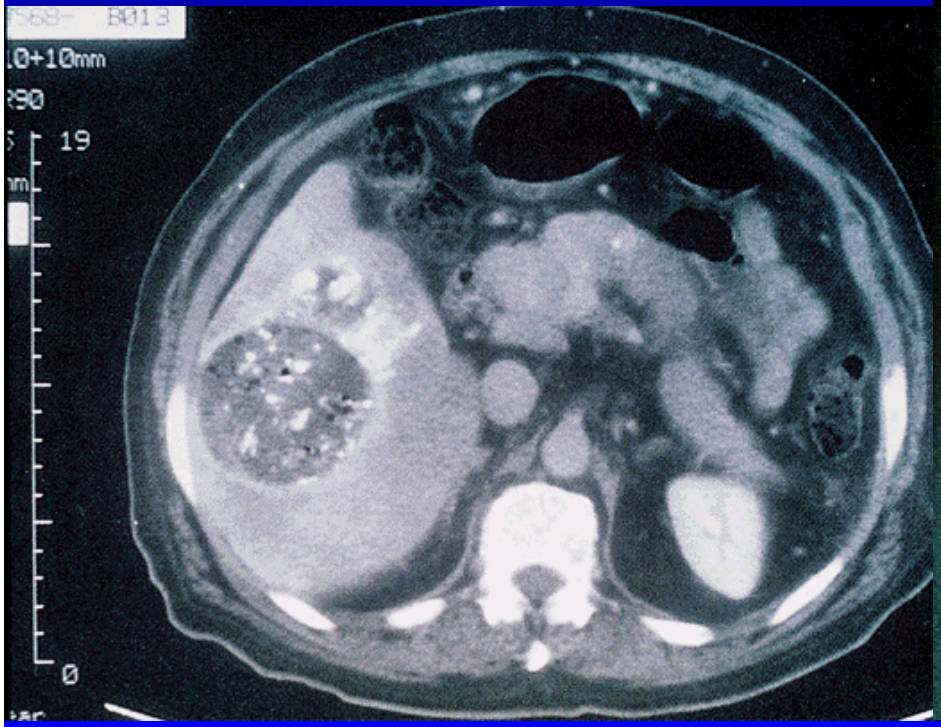


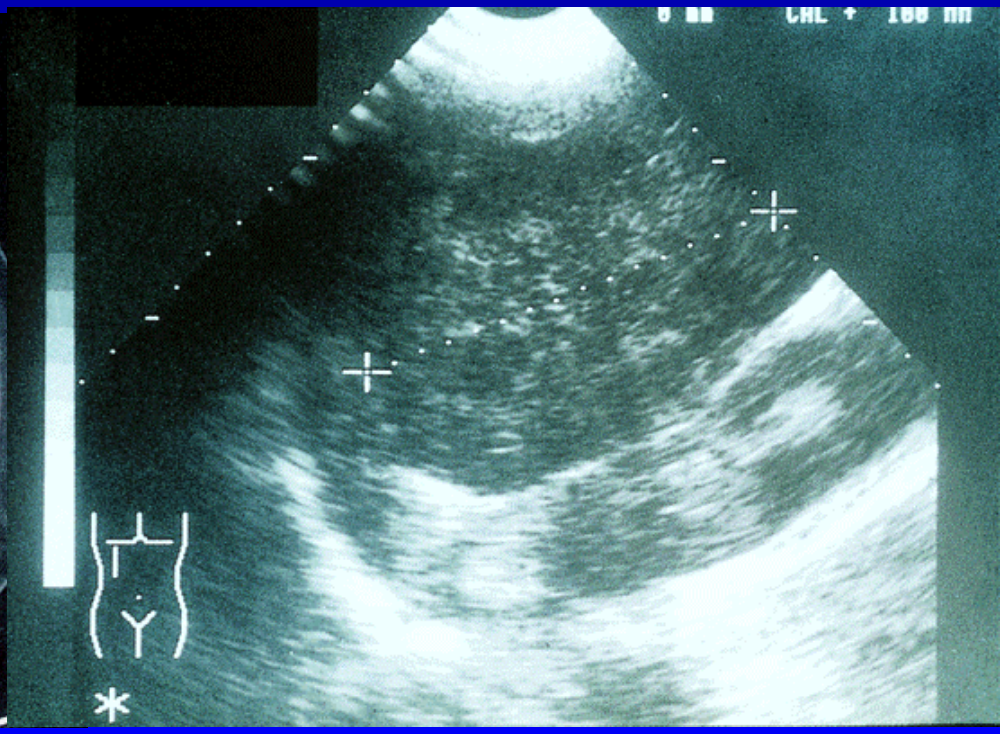
HCC in cirrhotic liver



HCC in non-cirrhotic liver

Hepatocellular Carcinoma (HCC)



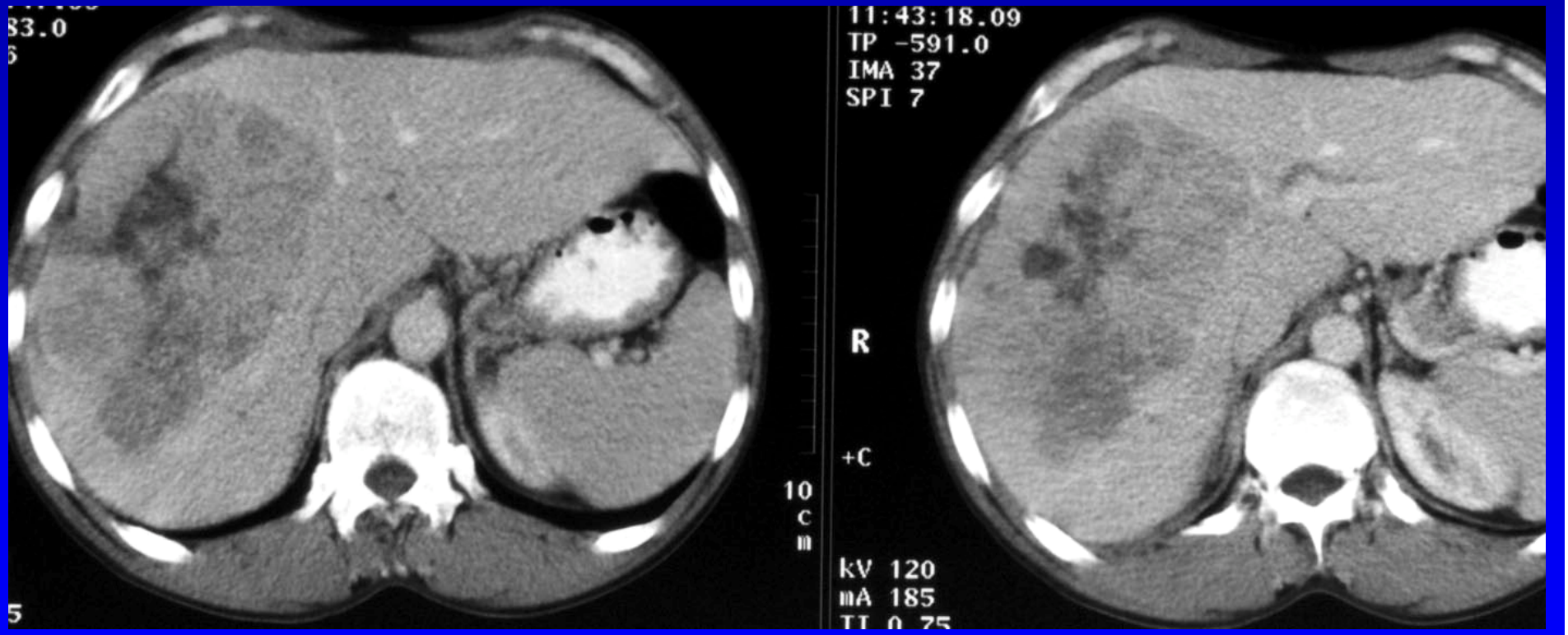


HCC on CT scan

IV Lipiodol

HCC on USS scan

HCC in Non-Cirrhotic Liver



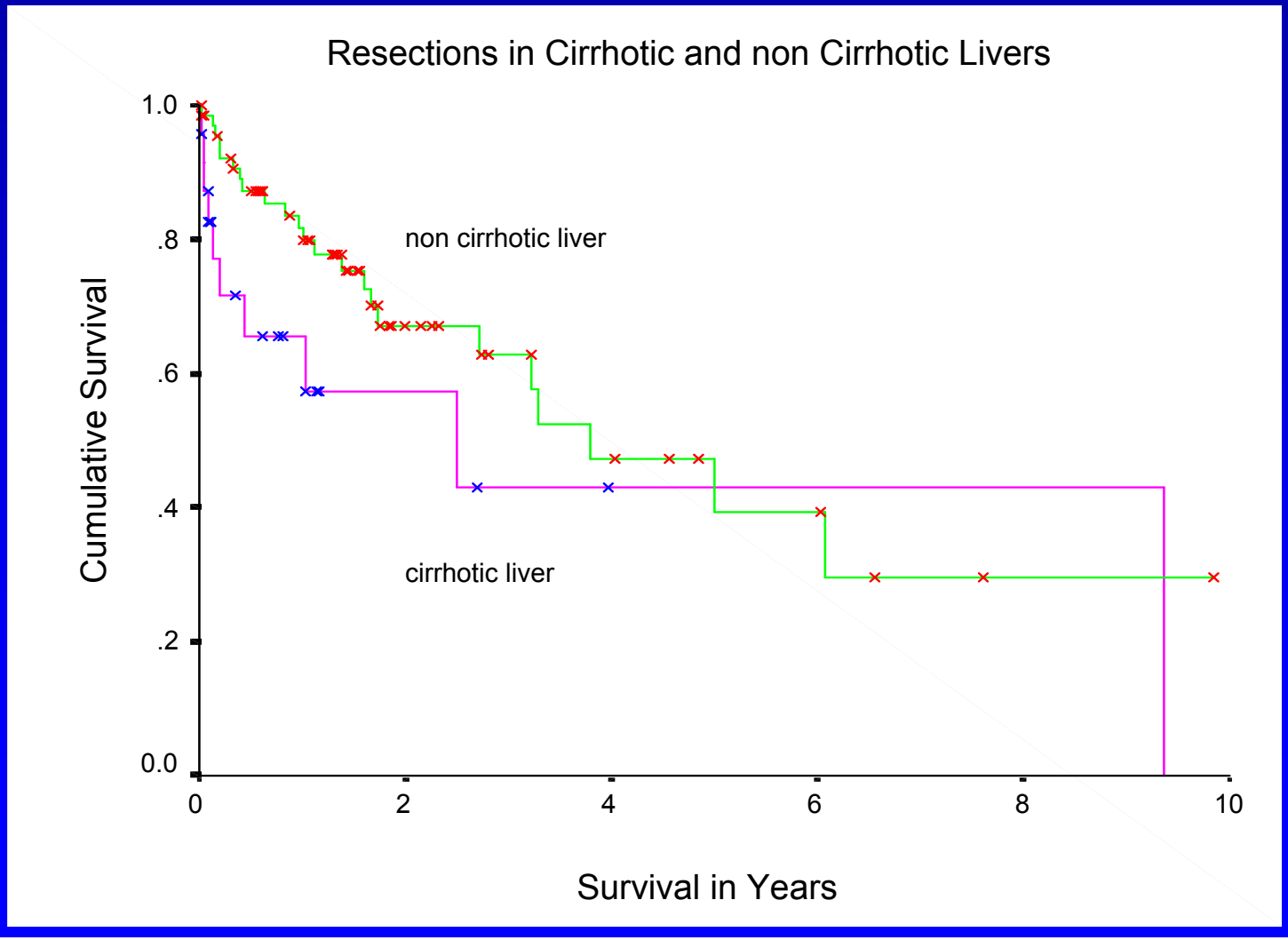
Liver Resections for Hepatocellular Carcinoma QEH 1990-2003

	Cirrhotic	Non-cirrhotic	Total
N	24	68	**92**
Gender - male - female	17 7	41 27	**58** **34**
Median Age (range) yrs	66 (24-78)	65 (19-80)	**65 (19-80)**
Major resection Left lateral Segmentectomy Non-anatomical	5 4 5 10	49 5 10 4	**54** **9** **15** **14**
Number tumours – 1 - >1 other	22 1 1	59 6 3	**81** **7** **4**
30 day mortality	6(25%)	5(7.4%)	**11(11.9%)**

Resections for HCC Underlying Disease

Cirrhotic	Non-cirrhotic
ALD – 6	PSC – 1
Haemachromatosis – 2	HBV – 5
HBV – 3	HCV – 2
HCV – 6	Porphyria – 1
PBC – 1	Fibrolamellar - 8
Other - 6	

Liver Resections for HCC Survival Cirrhotic vs Non-Cirrhotic



Resection vs Transplantation: Non-HCV Patients

Resection

- non-cirrhotic
- cirrhotic Child A/?B
  - single lesion
- cirrhotic non-transplant candidate

Transplantation

- non-cirrhotic: not resectable = not curable
- cirrhotic
  - up to four lesions
  - up to 5 cm

Transplantation for HCC Outcomes

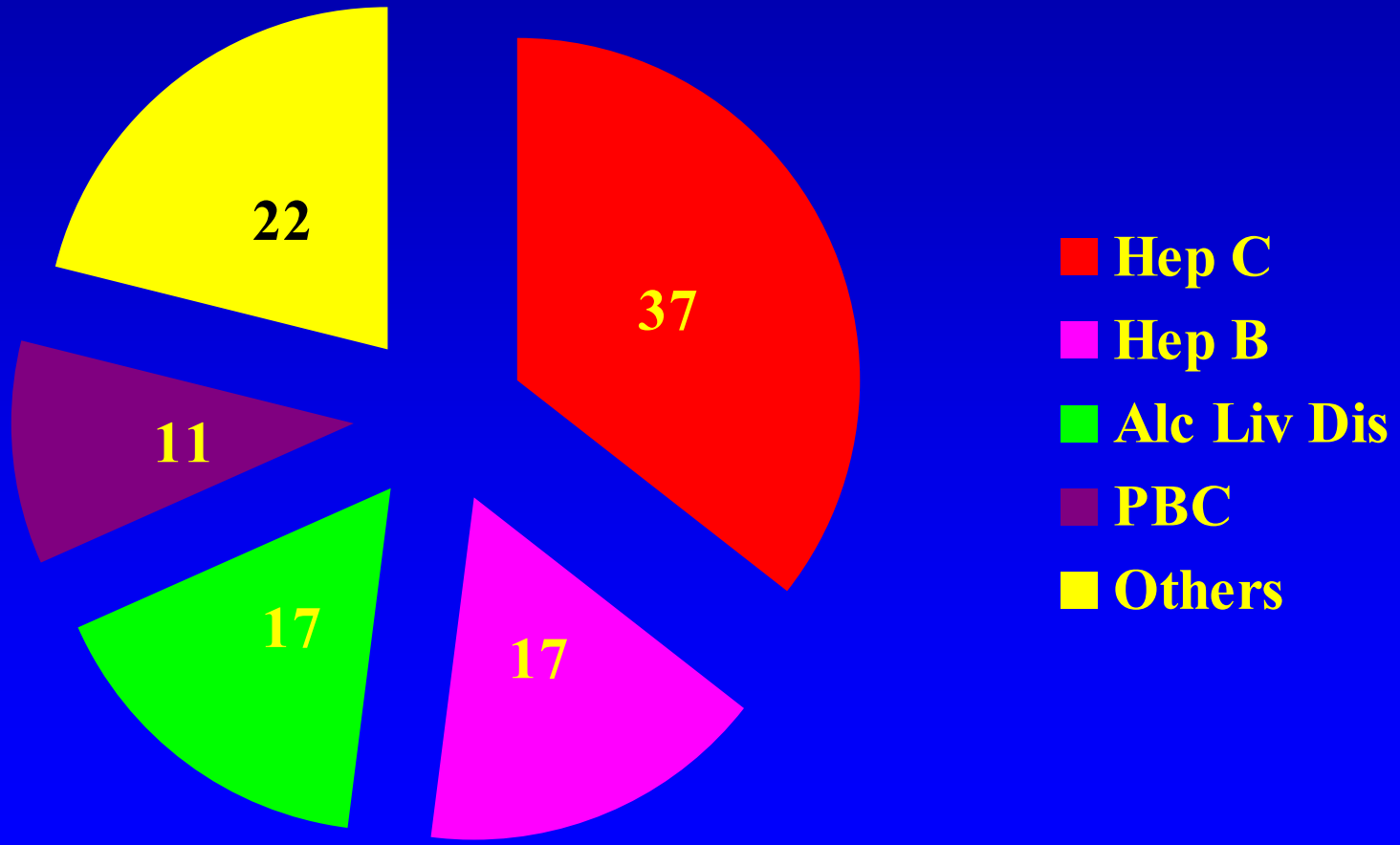
- Large tumour –
  - cirrhotic or non cirrhotic
  - 5 year 20 - 25%
- Small tumour –
  - < 4 lesions
  - < 4 cm
  - 5 year 70 - 80%

Transplantation for HCC in B'ham:
Factors Influencing Outcome

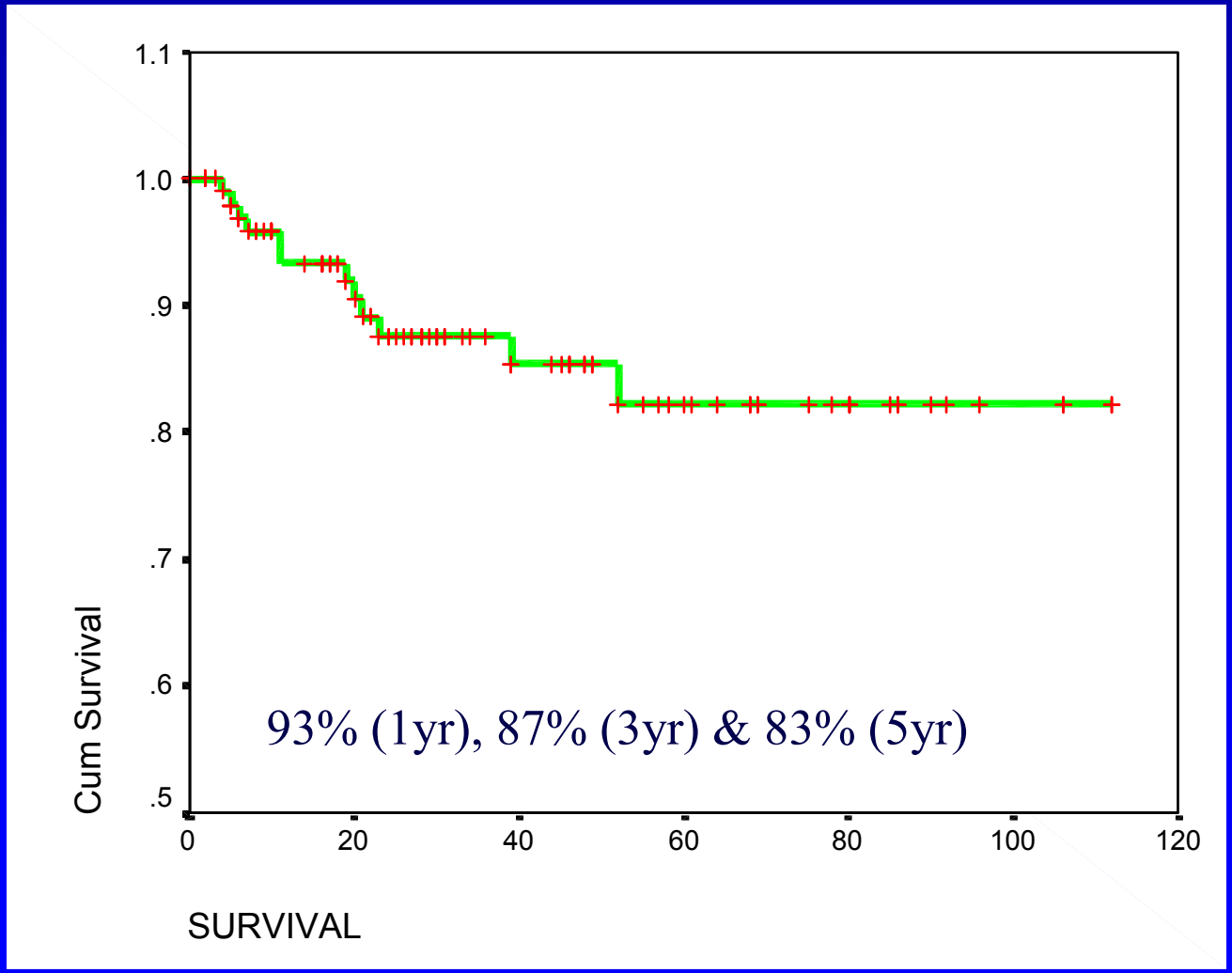
- Total 104 patients
- 74 male, 30 female
- Median age 57 yrs (18-72yrs)
- 28 incidental findings
- 46 multifocal disease

- Univariate analysis
  - tumor size ($p<0.05$)
  - infiltrative margins ($p<0.05$)
  - capsular invasion ($p<0.05$)
  - presence of satellite nodules ($p<0.01$)
- Multivariate analysis
  - Presence of satellite nodules

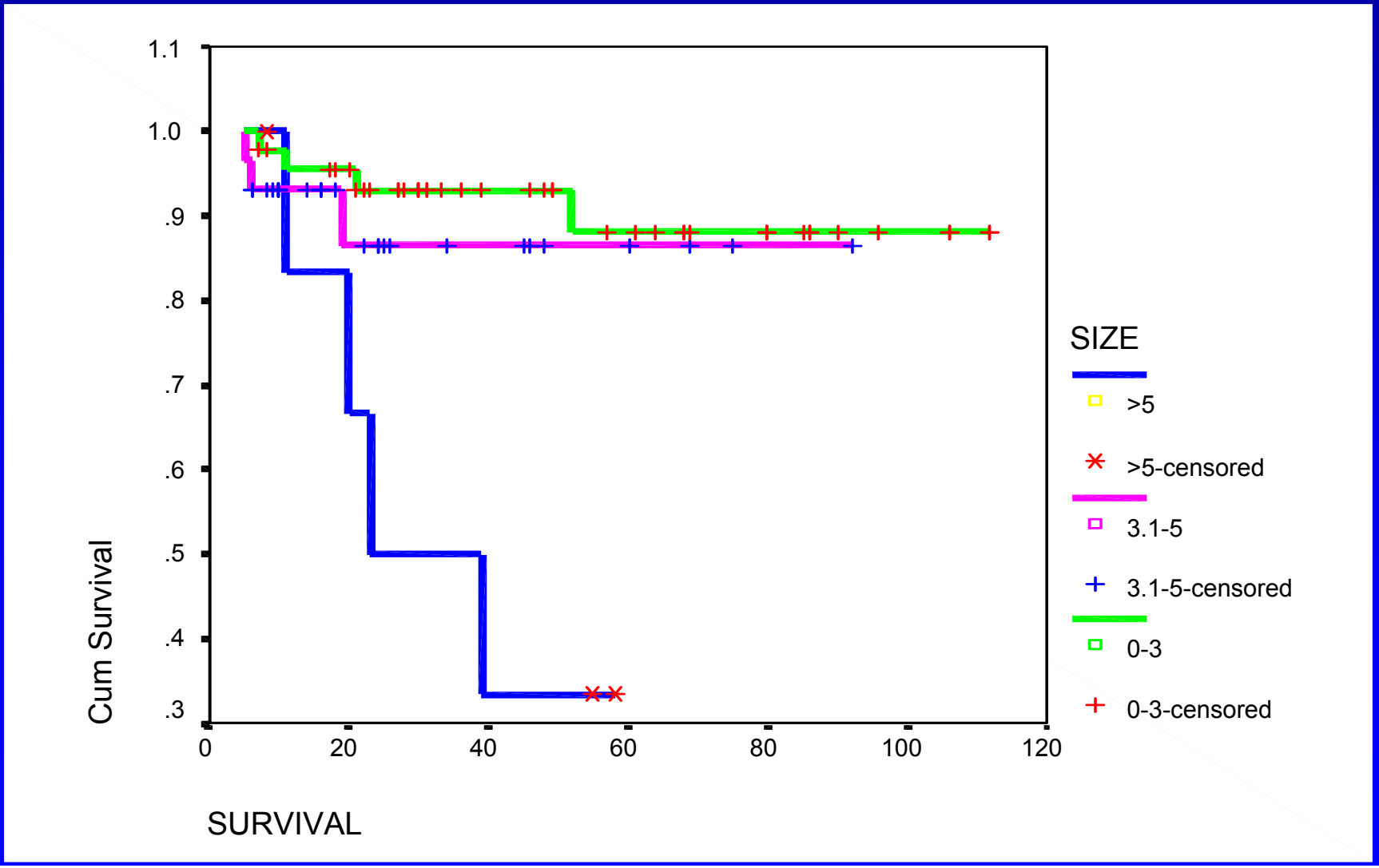
Transplantation for HCC in B'ham



Disease Free Survival Following Transplantation for HCC



Influence of Tumour Size on Survival

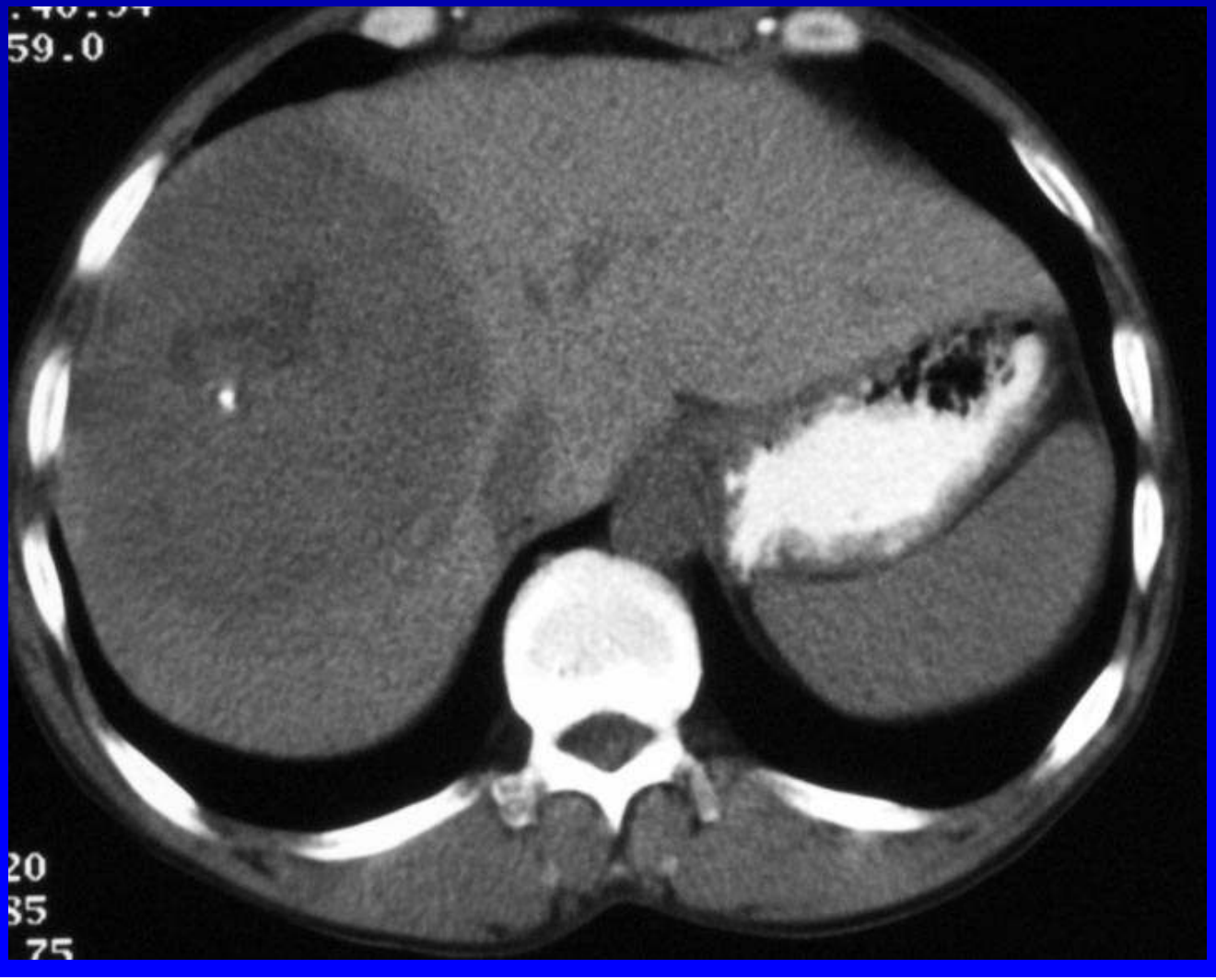


Fibrolamellar HCC

- Uncommon variant
- Younger patients
- AFP negative / stellate scar
- Better prognosis*
  - resected (n=11) 100% survival at 3 years
  - transplanted (n=9) 75% survival at 3 years

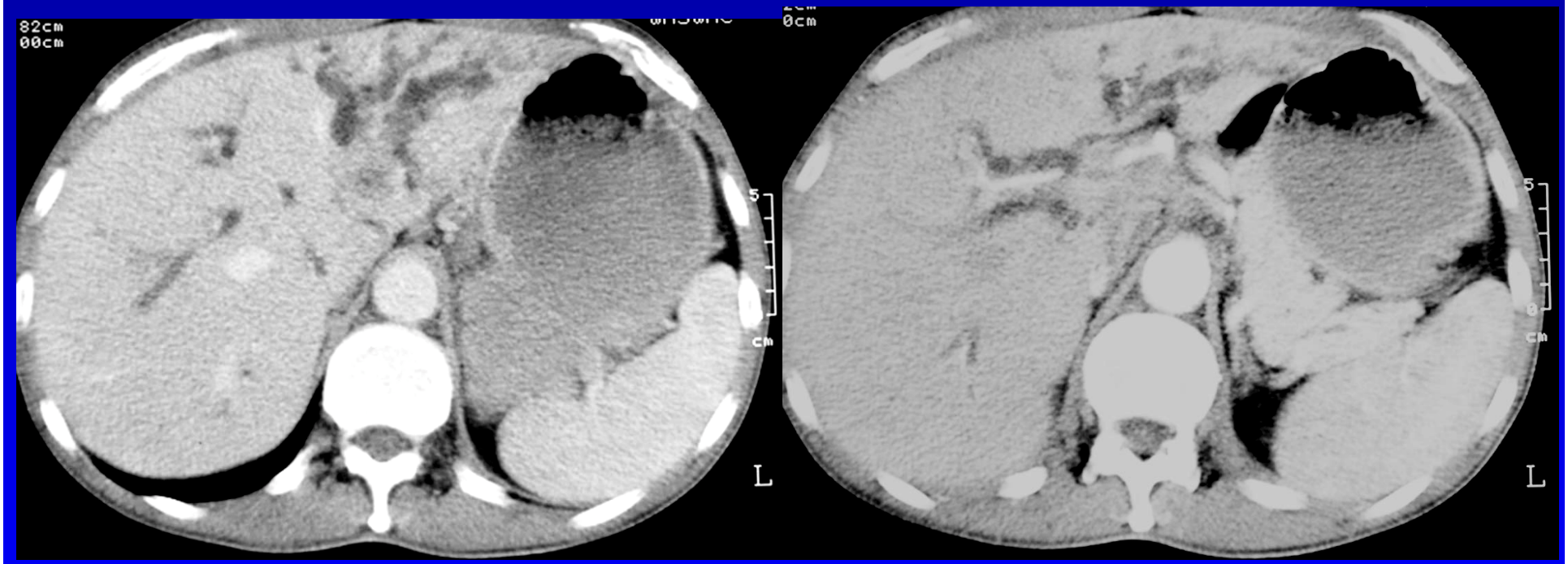
* El-Gazzaz et al, Transpl Int 2000

Fibrolamellar HCC in Normal Liver



Surgery for Bile Duct Cancer (Cholangiocarcinoma)

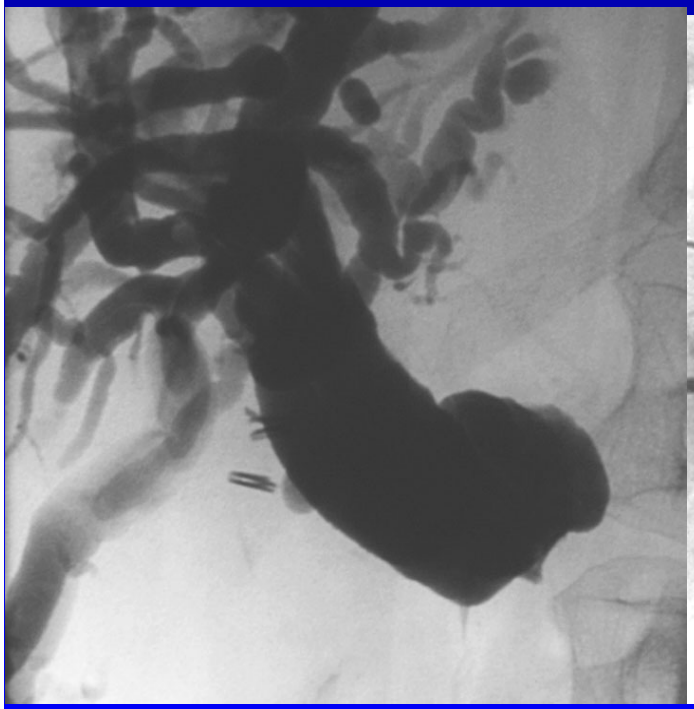
Cholangiocarcinoma



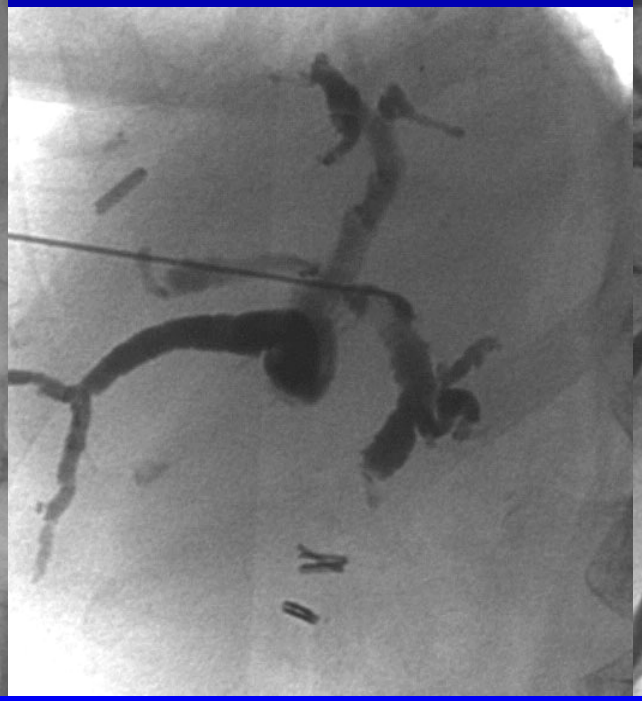
Predominantly left sided lesion

Spreading to involve right ducts

Cholangiocarcinoma



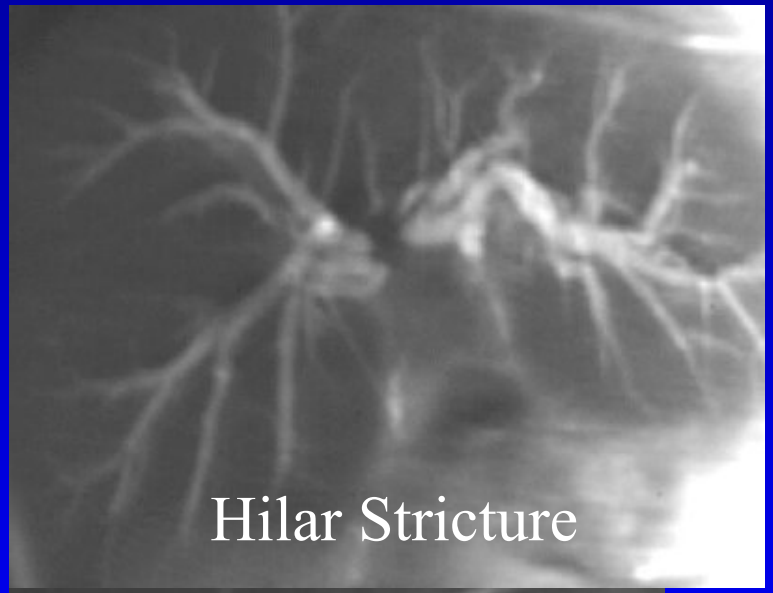
PTC



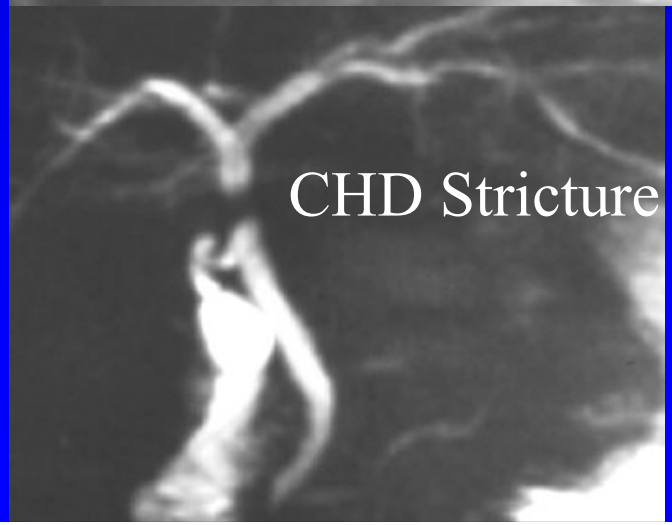
External Drainage

Cholangiocarcinoma

Bilateral Metal Stents



Hilar Stricture

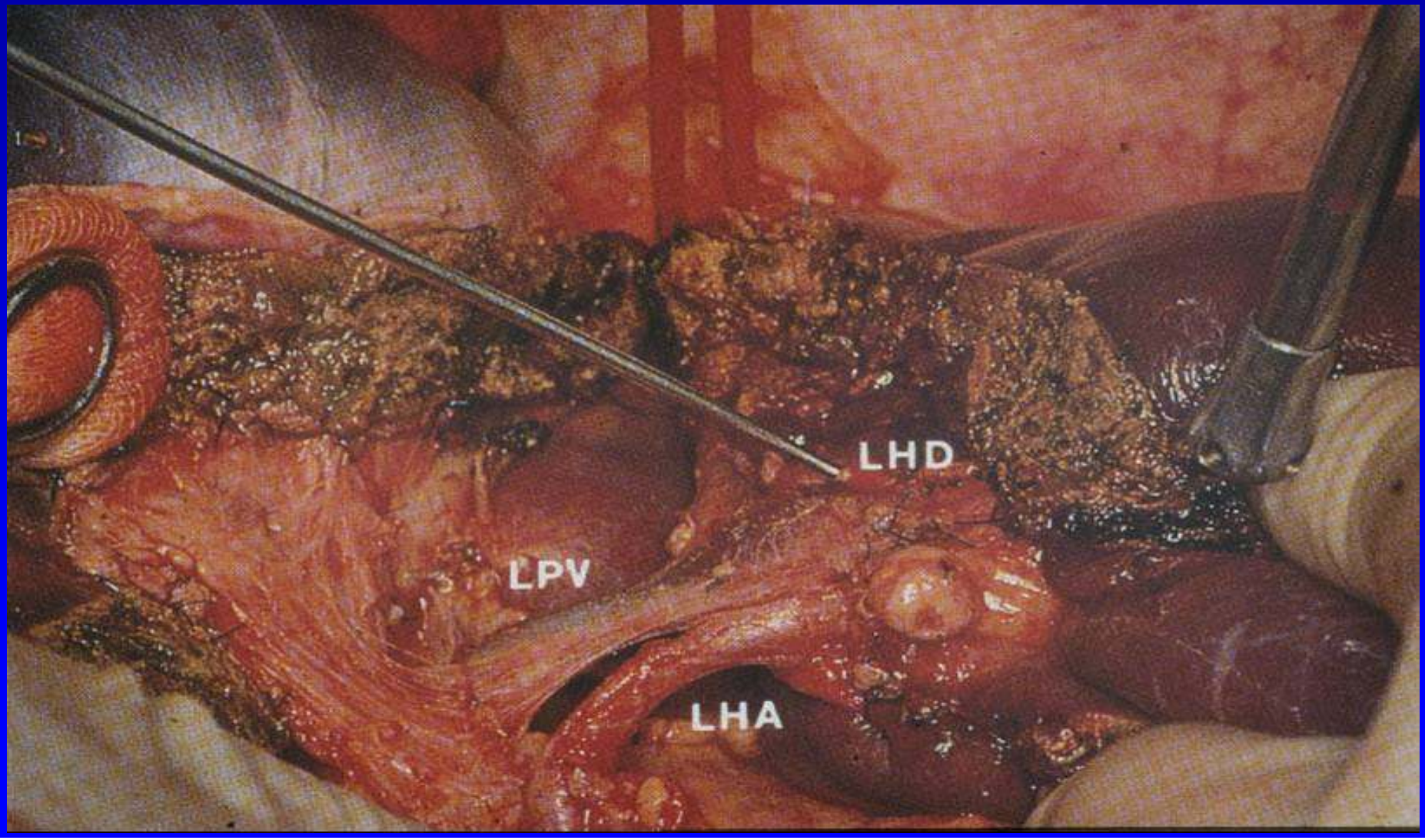


CHD Stricture

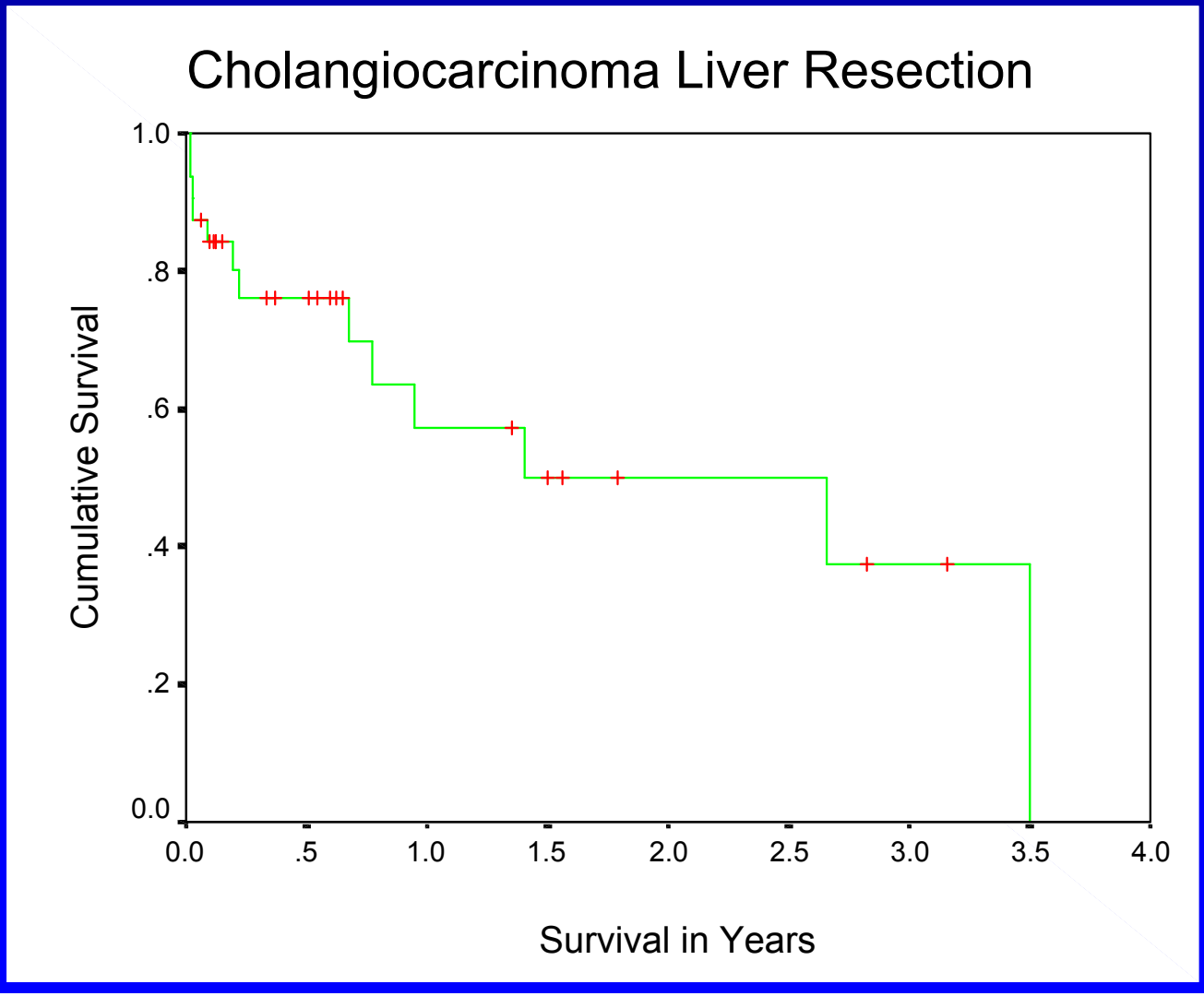
Liver Resections for Cholangiocarcinoma QEH 1997-2003

- Liver resection - 33 patients with cholangiocarcinoma
- 21 diagnostic laparoscopies
- 13 extra hepatic bile ducts excisions
- 41 palliative operations
- 30 day mortality 5 (15.1%)

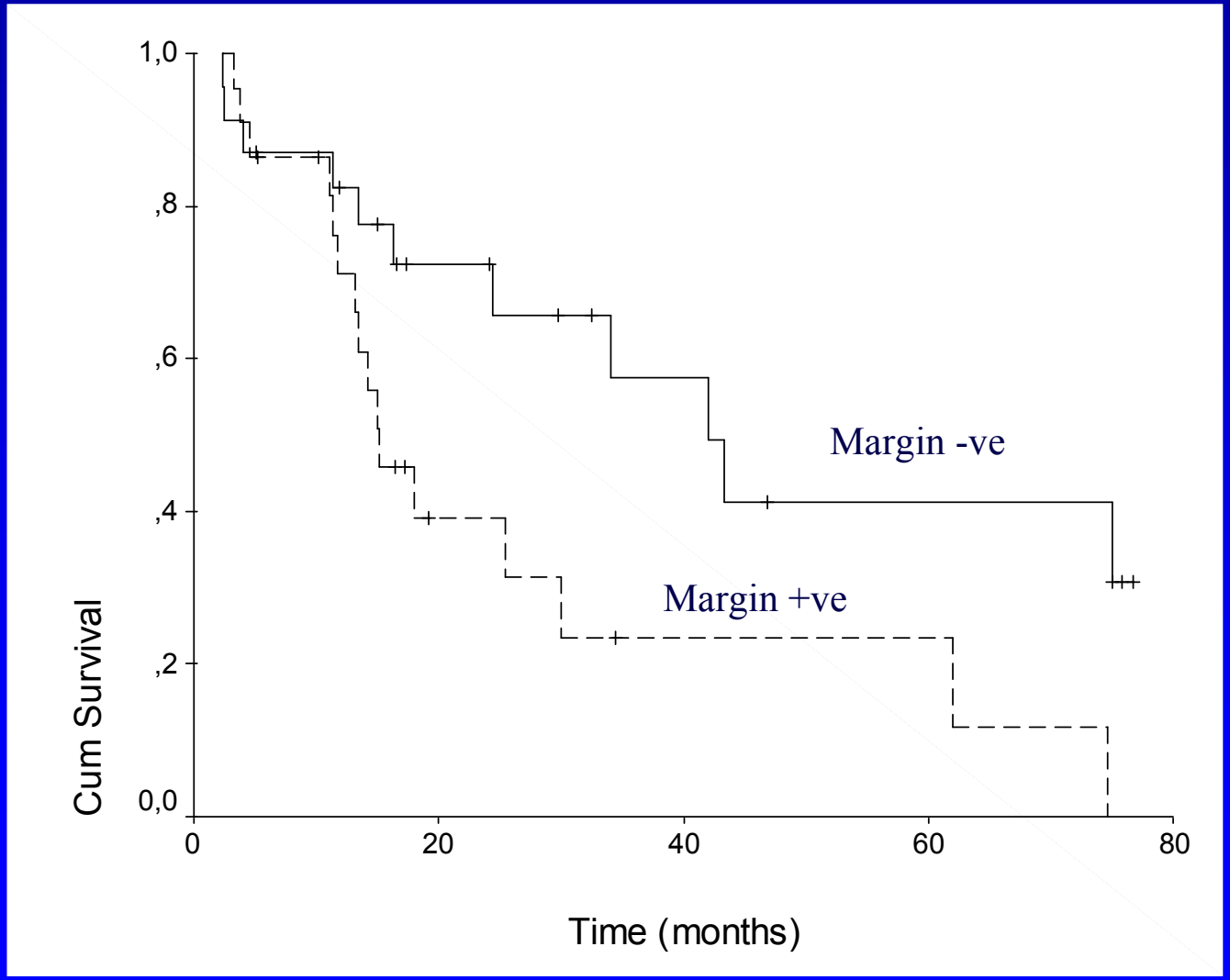
Extended Right Hemi-hepatectomy



Overall Survival Following Liver Resection for Cholangiocarcinoma



Survival in Cholangiocarcinoma Margin Status



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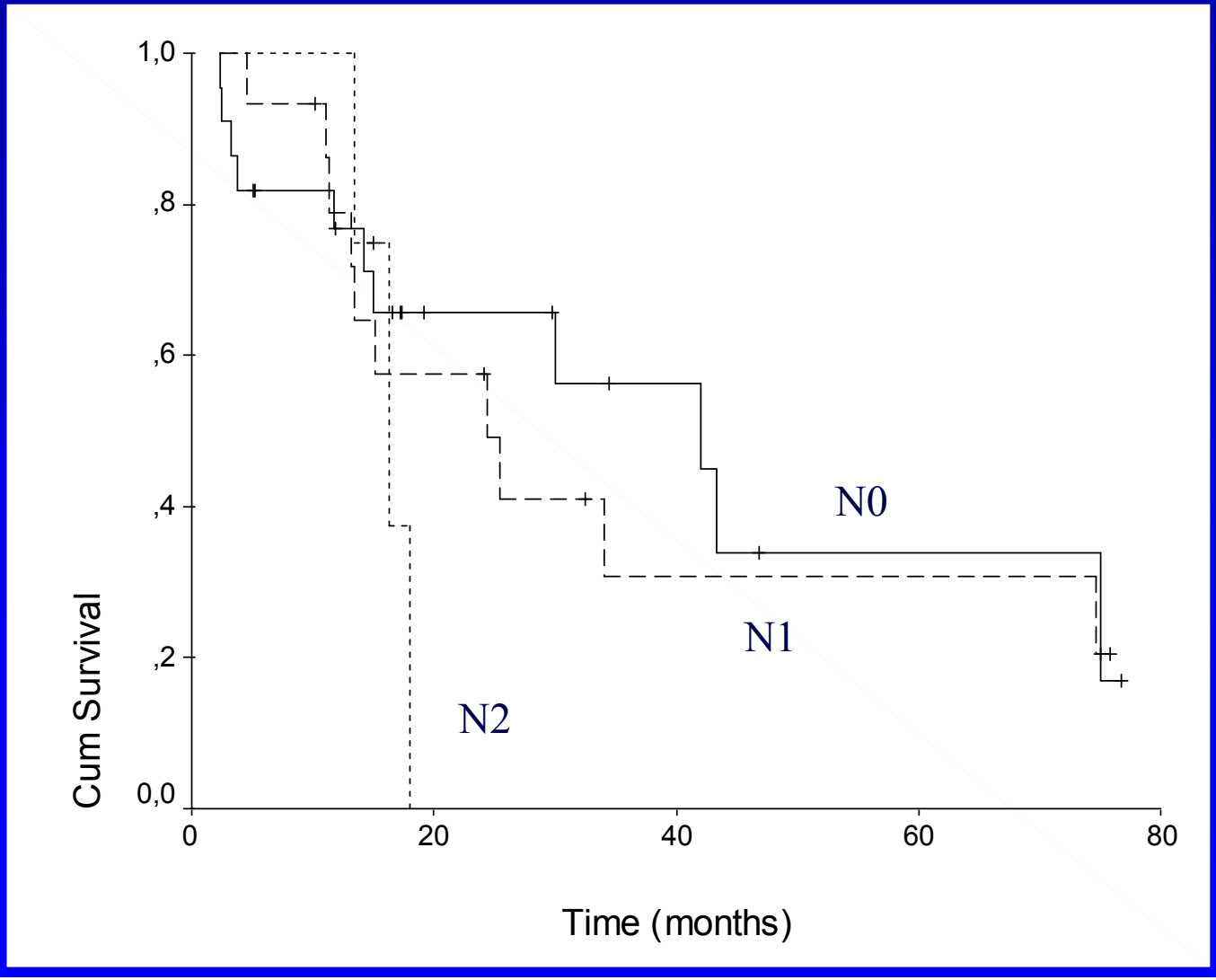
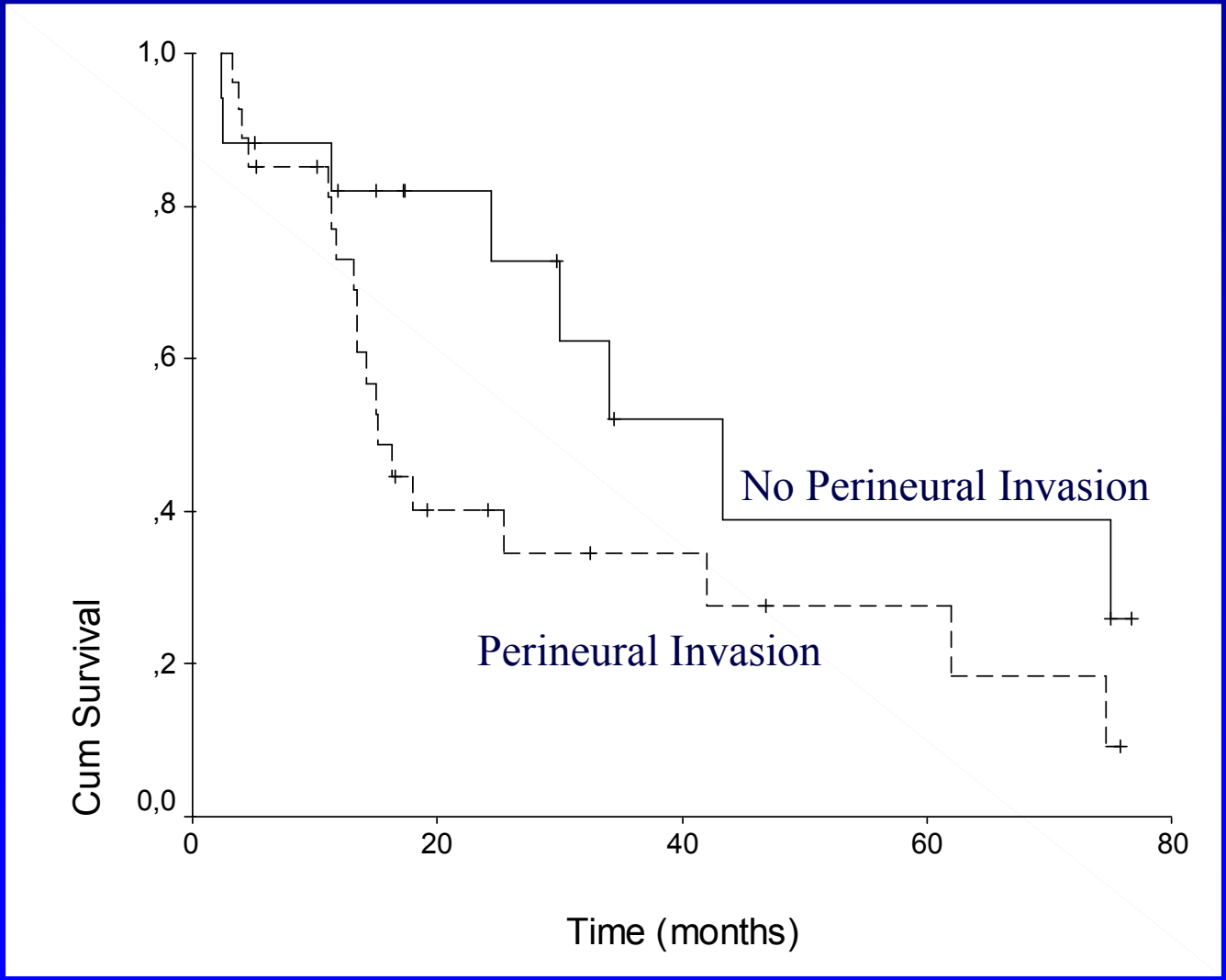
Survival in Cholangiocarcinoma Lymph Node Status



Survival in Cholangiocarcinoma Perineural Invasion



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Summary

- HPB cancer includes:
  - Pancreatic cancer
  - Ampullary cancer
  - Bile duct cancer
  - Gallbladder cancer

  - Liver cancer
    - Liver metastases (secondary)
    - Hepatocellular cancer (primary)

Conclusions

- Traditionally the survival for these cancers has been poor
- Surgical improvements has seen significant improvements in survival
- Patient management MUST be concentrated in specialist centres to achieve good results
  - Patients must be willing to travel
- Concentration of resources has lead to better combinations of treatment and survival will continue to improve