

Fig. 2 X-ray abdomen showing gas in the region of the left lobe of the liver.

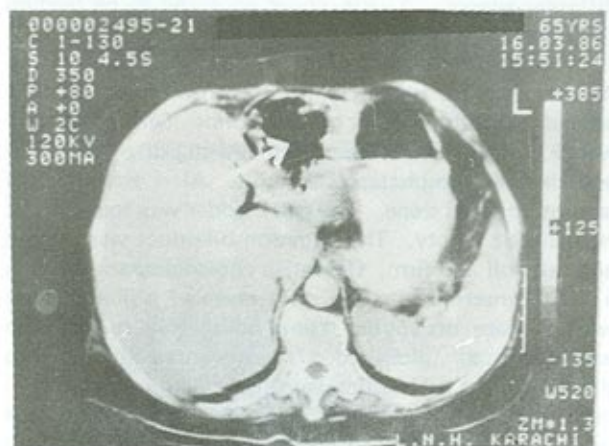


Fig. 3 CT scan showing an abscess in the left lobe of the liver.

#### DISCUSSION:

The cause of pyogenic liver abscess in our patient could have been cholangitis, an infected pancreatic fistula or ligation of the hepatic artery during surgery. A post-operative rise in serum bilirubin, SGPT and prothrombin time as in our case, usually occurs as a result of accidental ligation of the hepatic artery. Hepatic necrosis, however, does not always occur as a result of accidental hepatic artery ligation because compensatory oxygenation by the portal vein occurs and eventually, if the phrenic arteries are intact, collateral circulation develops.

Gas containing pyogenic liver abscesses are rare. Eleven cases have been reported in the medical literature: 2 following appendicitis, 2 following cholangitis, 2 as a result of accidental ligation of the hepatic artery and in 5 cases the cause was not known. A single organism was cultured in 5 cases whereas growth of 2 or more organisms was obtained in 5 cases and in 1 case the organism was not known. *Klebsiella*, *Clostridium perfringens* and *E. coli* were isolated in each of 3 cases; *Pseudomonas aeruginosa* and *Streptococcus viridans* in each of 2 cases and *Enterococcus* in 1 case. Recovery occurred following institution of anti-biotics and drainage in 7 patients, 3 died despite these measures and 1 died before treatment could be instituted. The fatality of 36.7% in this small collected series of liver abscess due to gas containing organisms is probably an underestimate as many fatal cases must go unreported.

In S. Foster and co-workers' series<sup>1</sup> plain X-rays revealed multiple gas containing cavities in 2 cases, air fluid levels in 5 cases and a mottled gas pattern in 4 cases. Gas in a liver abscess should be differentiated from a subphrenic abscess. Intervening liver tissue between the abscess wall and the diaphragm, a mottled gas pattern, a mobile diaphragm and absence of a pleural effusion favour a liver abscess<sup>1</sup>. Air in the portal vein as a result of infection has a characteristic fine tubular pattern which is most prominent in the periphery<sup>2</sup>. Air in the biliary tree is usually present in the large bile ducts and again forms a characteristic pattern<sup>2</sup>. In emphysematous cholecystitis the distribution of gas bubbles follows in an annular pattern and there is an air fluid level in the erect posture<sup>1</sup>.

A soap bubble appearance may occur in pancreatic necrosis and is difficult to distinguish from anaerobic infection in the left lobe of the liver. Nevertheless, in the appropriate clinical setting suspicion of an anaerobic liver infection should be aroused on visualizing mottled gas in the epigastrium. This could then be confirmed by ultrasound and CT scan.

#### REFERENCES:

1. Gas Containing Pyogenic Intraphepatic Abscess. Stanley C. Foster, M.D.; Bernard Schneider, M.D. and William B. Seaman, M.D. *Journal of Radiology* 1970 94:613-618.
2. Antemortem Radiographic Demonstration of Gas Gangrene of the Liver. Mathew W. Elson, M.D. *Journal of Radiology* 1960, 74: 57-60.

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the lungs bilaterally. The JVP appeared to be moderately raised. However, the ECG showed no ischaemic changes and chest X-ray was clear. She was given intravenous Digoxin 0.5 mg and Frusemide 20 mg. As a result, the respiratory rate came down to 30/minute, basal crepitations cleared and blood pressure improved to 140/90 mm Hg. Tachycardia persisted, the pulse rate was 140/minute. She was started on intravenous Ampicillin 1 Gm 6 hourly in addition to Gentamycin.

On the third post-operative day, she became drowsy. She had a leukocyte count of 22,700/cu mm, total serum bilirubin of 20.8 mg/dl, direct bilirubin of 9.0 mg/dl, indirect bilirubin of 11.8 mg/dl, SGPT of 1125 I.U./L, alkaline phosphatase of 378 I.U./L and the prothrombin time was prolonged to 20 seconds (control 13 seconds). Metronidazole 500 mg 8 hourly by infusion was added to the antibiotic regimen. The total serum bilirubin peaked at 24.1 mg/dl the next day, although the SGPT had declined to 720 I.U./L. The patient's general condition gradually improved until the seventh post-operative day when following removal of the drain in the right subhepatic area, she developed another episode of tachynoea and fever of 38°C. Fine bilateral basal crepitations appeared but the chest X-ray was clear. Digoxin 0.25 mg and Frusemide 20 mg were administered again and intravenous Cefotaxime 1 gm daily was introduced in the place of Ampicillin. Fever and tachypnoea however contained and the leukocyte count was 26,900/cu mm. An ultrasound examination showed a collection of fluid at the site of the pancreaticojejunal anastomosis. Consequently, a drain was re-introduced to this area through the previous drain tract. Approximately 250-300 cc of fluid were drained daily from this drain. The amylase content of the fluid was 1630 IU/L. She also developed a wound infection necessitating removal of skin sutures and debridement.

She improved again until the 14th post-operative day when fever recurred. This time no obvious cause of the fever could be found. All antibiotics were stopped, the cultures from the wound, drainage tube and T-tube grew *Serratia liquificans*. The blood and urine showed no growth. A plain film of the abdomen revealed gas in the region of epigastrium (Fig. 2). Ultrasound examination confirmed air in the epigastrium continuous with the left lobe of the liver. CT scan confirmed gas in an abscess in the left lobe of the liver (Fig. 3). Antibiotics were recommended namely intramuscular Carbenicillin 2 gm 6 hourly. She was re-explored on the 33rd postoperative day when conservative treatment with antibiotics failed to improve her condition. A 6x8 cms abscess containing necrotic

lier and thick pus was drained from the medial segment of the left lobe of the liver. A feeding and draining jejunostomy were constructed. Gram staining of the pus showed gram positive cocci and bacilli. She was put on Metronidazole, Amikacin and Chloramphenicol. Carbenicillin was stopped. Culture revealed a growth of *Enterobacter cloacae*, *Serratia liquificans* and *Clostridium perfringens*. Benzylpenicillin was started in a dose of 4 mega-units every 6 hours in addition to Metronidazole and Amikacin. Chloramphenicol was stopped.

Her course thereafter was somewhat more stable aided by parenteral feeding and feeding through the jejunostomy. Although fever occurred once more as a result of infection around the jejunostomy tube, she was finally discharged on the 71st postoperative day, 11 weeks after her admission. Histology had confirmed adenocarcinoma of the gall bladder invading the common bile duct.

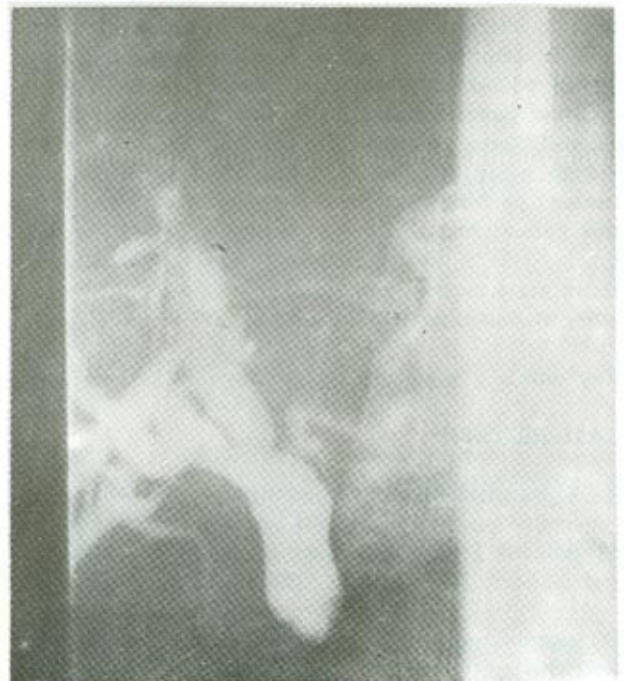


Fig. 1 Percutaneous transhepatic cholangiogram showing complete obstruction to the common bile duct. The cystic duct is not visualized.

## Gas in a Liver Abscess — A case report

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The high mortality in pyogenic liver abscesses is due largely to difficulty in diagnosis. Clinical features of the primary pathology responsible for the abscess tend to over-shadow signs of liver involvement. The case is described of a 55 year old woman, whose febrile post-operative course following cholecystectomy and pancreaticoduodenectomy for carcinoma of the gall bladder invading the common bile duct led to the discovery of a left lobe liver abscess due to *Clostridium perfringens*. Plain X-ray of the abdomen in this patient had shown air in the region of the left lobe. This simple radiological sign should, in the appropriate setting, alert the physician to the possibility of anaerobic liver infection.

**Key words :** Liver abscess — *Clostridium perfringens*

### CASE REPORT :

A 55 years old woman was admitted to The Aga Khan University Hospital with right upper quadrant abdominal pain of 2 years' duration, anorexia for 2 months and jaundice for 1 month. There was no weight loss.

On examination, she was markedly icteric and the liver was tender, smooth and palpable 4 cm below the right costal margin.

The haemoglobin was 10.1 gm/dl, PCV 31.7%, white cell count 5,600/cu mm, ESR 39 mm in the first hour and fasting blood sugar 157 mg/dl. She was not a

known diabetic. The total bilirubin was 8.9 mg/dl, direct bilirubin was 8.9 mg/dl, direct bilirubin 5.1 mg/dl, gamma GT 141 I.U./L (normal 7 to 64 I.U./L), SGPT 111 I.U./L (normal 10 to 60 I.U./L), alkaline phosphatase 257 I.U./L (normal 26 to 88 I.U./L), prothrombin time was 14 seconds (control 13 seconds) and serum albumin was 3.3 gm/dl (normal 3.5 to 5.1 gm/dl).

Ultrasonography revealed stones in a thick walled gall bladder. Percutaneous transhepatic cholangiography showed complete obstruction at the lower end of the common hepatic duct and lack of gall bladder opacification. The obstruction appeared to be due to a malignancy (Fig. 1).

At operation, a hard mass was found in the region of the common bile duct at the point of entry of the cystic duct. A distended thick walled gall bladder contained pus in addition to multiple stones. There was no evidence of carcinoma in the liver and peritoneum. A cholecystectomy and pancreaticoduodenectomy was performed. The operation lasted 8 hours. Intramuscular Gentamycin, which had been started prior to the percutaneous transhepatic cholangiography was continued post-operatively, and the blood glucose level was controlled during and after operation with soluble insulin.

Twenty-four hours after surgery, the patient's blood pressure dropped from 180/80 mm Hg to 124/70 mm Hg, The pulse rate increased to 144/minute and she became tachypnoeic. The respiratory rate was 36/minute. She had developed fine basal crepitations in

Received for publication 22.2.87.

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