

## MODIFIED LONGMIRE'S OPERATION FOR PROXIMAL EXTRAHEPATIC BILIARY OBSTRUCTION

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### SYNOPSIS

Two cases of biliary obstruction at the junction of the right and left hepatic duct by metastasis at the porta-hepatis and cholangiocarcinoma are presented. These were treated by adapting Longmire's operation of intrahepatic cholangiojejunostomy to the right lobe of the liver. The technique of this modified Longmire's operation is described. The difficulty of treating proximal extrahepatic biliary obstruction is discussed with a review of the literature.

### INTRODUCTION

Biliary obstruction at the junction of the right and left hepatic ducts by cholangiocarcinoma or porta-hepatis metastasis presents a challenge to the surgeon in its management. The Longmire's operation was devised to enable retrograde bile flow (1, 2). It involves the anastomosis of a Roux loop of jejunum to a dilated intrahepatic duct, exposed by partial amputation of the left lobe of the liver. This operation has not been widely used because of the difficulty in locating the left intrahepatic duct and because of a reported high operative mortality of 26% (3).

Anatomically the right and left lobes of the liver are of roughly equal mass (4) but on cholangiography, the right lobe has a preponderance of ducts. The Longmire's operation can be adapted for use on the right lobe of the liver. Kirk (5) presented eight such cases with satisfactory relief of jaundice and without any operative mortality.

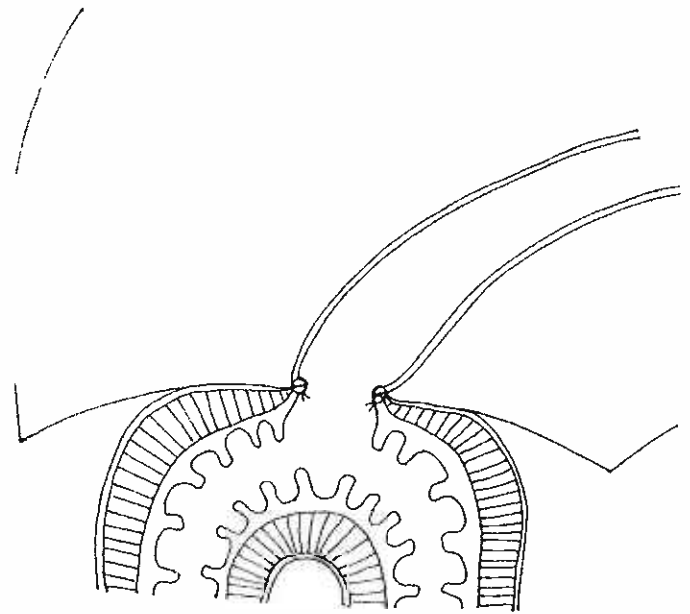
**METHOD**

A pre-operative percutaneous cholangiogram is carried out to determine the site of biliary obstruction and to locate a large peripheral intrahepatic duct.

A right triangular ligament is divided to expose the bare area of the liver and a hand is passed behind to deliver the right lobe of the liver to the wound. A large pack is then placed behind the liver.

After localising a suitable peripheral duct on the cholangiogram, a slice of liver 3-4 cm thick is cut from the tip of the right lobe of the liver. This is best done by the "finger-fracture" technique (6). Further slices of liver 1 cm thick can be cut until a large duct is exposed. This is further dilated with Bake's dilators to a diameter of 6-8 mm. Hepatic suture are then applied to the cut surface of the liver to obtain haemostasis. An "omega loop" of jejunum is then brought up and a small opening is made on its antimesenteric border. A wide-bore tube (16 gauge Nelaton Suction Catheter\*) with side-holes is then threaded through the opening. One end of this tube is brought out through the efferent loop of the jejunum while the other end is introduced into the dilated intrahepatic duct. It is important not to manipulate this tube too vigorously as the jejunal mucosa could be torn and this would render the opening too big to match the intrahepatic duct. Anastomosis of the intrahepatic duct to the jejunum is carried out with interrupted 4.0 polyglycolic acid suture with mucosa-to-mucosa apposition. The seromucularis of the jejunum is stitched to the cut margin of the liver capsule.

A jejuno-jejunosomy is then fashioned distal to the distal limb of the tube. The tube is brought out through the abdominal wall. The pack is removed and the wound closed over a suction or corrugated drain. Figs 1 & 2. Post-operative cholangiogram can be performed through the tube which is removed two weeks later.

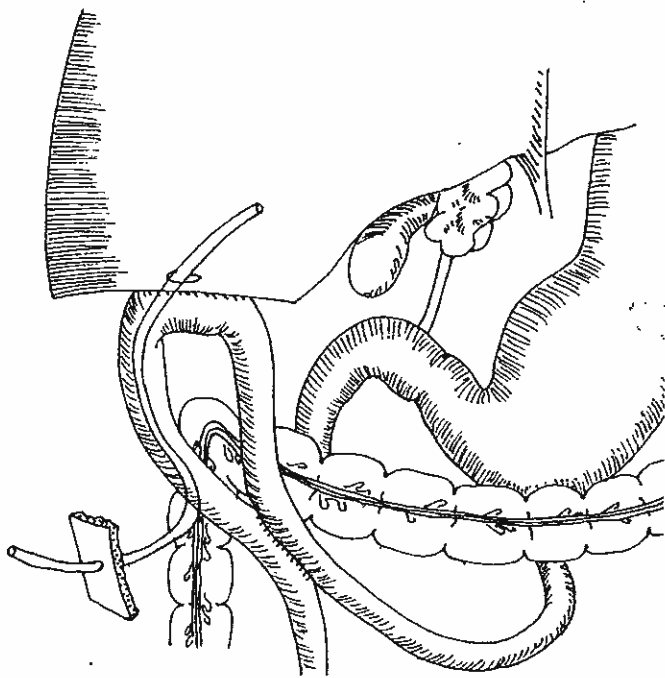


**FIG 2: CLOSE-UP OF THE CHOLANGIOJEJUNAL ANASTOMOSIS**

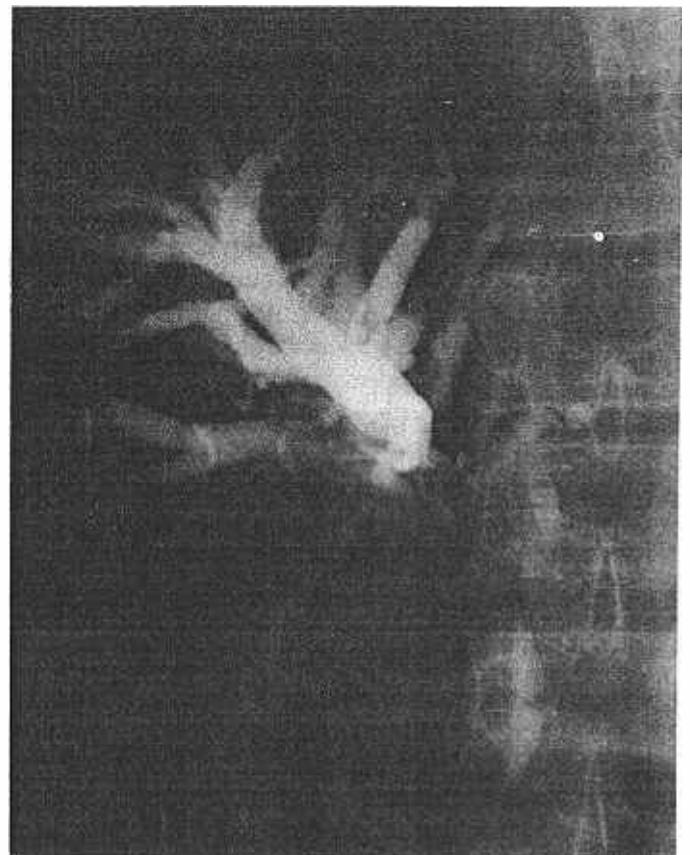
**CASE I**

A 40 years old chinese male presented with a three month history of epigastric pain, weight loss and progressive jaundice. This was accompanied by generalised pruritus. Three years previously, he had a Bilroth II gastrectomy for a poorly differentiated adenocarcinoma of the antrum.

The serum bilirubin was 18.5 mg/dl. (range 0.2-1.4) and alkaline phosphatase was 1690 U/L (range 32-105). A liver scan showed multiple filling defects suggestive of secondaries. A percutaneous transhepatic cholangiogram showed obstruction at the common hepatic duct. (Figs. 3,4)



**FIG 1: RIGHT SIDED CHOLANGIOJEJUNOSTOMY WITH A TUBE IN PLACE**



**FIG 3: PTC OF CASE I SHOWING PROXIMAL BILIARY DUCT OBSTRUCTION**



FIG 4: "TUBOGRAM" SHOWING SATISFACTORY DECOMPRESSION

Laparotomy was carried out through a right subcostal incision. The porta-hepatis was found to be completely matted down with secondaries and adhesions from previous gastrectomy. The porta-hepatis could not be safely explored. A modified Longmire's operation was done using a loop of jejunum. There was no difficulty finding a dilated peripheral duct. Postoperatively, the patient developed a wound infection which settled with antibiotics. On discharge six weeks later, the jaundice and pruritus had settled. He remained afebrile and acholuric until his death from disseminated disease four months later.

#### CASE II

A 56 years old Chinese male presented with two weeks history of epigastric discomfort and progressive jaundice. He was found to have an enlarged liver, palpable 4 cm below costal margin.

The serum bilirubin was 22.5 mg/dL (range 0.2-1.4) and alkaline phosphatase was 565 U/L (range 32-105) percutaneous transhepatic cholangiography showed grossly dilated intrahepatic ducts with complete obstruction at the junction of the hepatic ducts Figs. 5,6.

A laparotomy was carried out through a right subcostal incision. The common hepatic duct down to the cystic duct junction was found to be a solid cord of tissue suggestive of cholangiocarcinoma. There were some small lymph nodes around the porta-hepatis. One of these nodes was biopsied. A modified Longmire's operation was carried out using a loop of jejunum. A dilated peripheral duct was easily found after sectioning the tip of the right lobe of liver.

Post-operative recovery was uneventful and the patient was discharged 14 days later. The bilirubin on discharge was 4.4 mg/dL, and the alkaline phosphatase was 1080 U/L, the histology of the lymph node showed only reactive hyperplasia. The patient remained well four months later. He was free



FIG 5: PTC OF CASE II SHOWING COMPLETE BILIARY OBSTRUCTION AT THE PORTA-HEPATIS

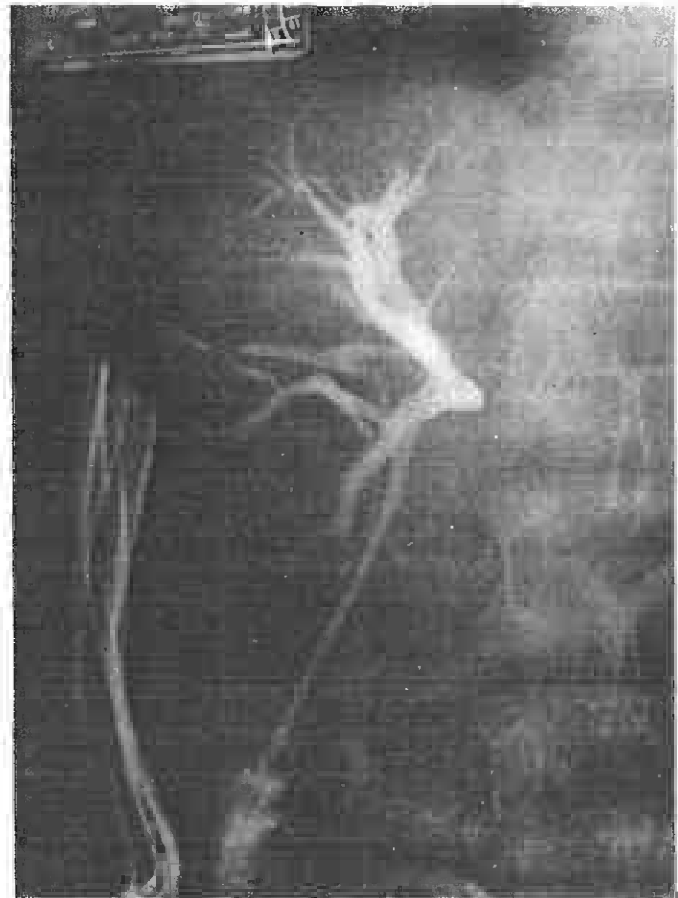


FIG 6: TUBOGRAM FIVE DAYS AFTER HIS OPERATION from jaundice and pruritus and there had been no attacks of cholangitis.

## DISCUSSION

Cholangiocarcinoma of the proximal extrahepatic biliary duct has always been a challenging problem for the surgeon. Curative resection is sometimes possible by splitting the liver vertically in the interlobar plane. (7,8,9,10). However, resectable cases are rare and long term results have been disappointing. (9,11). This is because of the proximity of the hepatic artery and portal vein which when affected would preclude a major resection. Also, Tompkins and co-workers have pointed out that lesions of the biliary tree may be multifocal and failure to recognise this may have accounted for many failures (12).

Liver transplantation has been advocated for cholangiocarcinoma as such a lesion were thought to remain localised to the liver until late in the course of the disease (13,14,15). Three of the 93 transplant recipients reported by Starzl were for cholangiocarcinoma. One of these died early of surgical complications, while 2 were alive at 2 and 1.5 years at the time of reporting. The two-year survivor had a recurrent tumour in the transplanted liver. (14). Fortner also reported three cases, all of whom died of graft rejection and other complications within 4 months (15). In a review of 184 cases of liver transplants by Iwatsuki, 21 cases were transplanted for primary liver malignancy comprising of mainly hepatoma and cholangio carcinoma. 8 died in the early postoperative period giving an operative mortality of 38%. Of the remaining 13 cases who survived for 2 months or more, 10 were reported to have tumour recurrence, most of these were in the newly acquired liver (16). In the Cambridge-King's College Hospital series, tumour recurrence rate is reported to be 60%. This is unacceptably high and there is a growing reluctance to accept cases of primary liver malignancy for transplantation (17).

Palliative procedures remain the mainstay of management for malignant obstruction of the proximal biliary tract. The aim is to relieve the distressing jaundice and pruritus. External drainage via a percutaneous transhepatic catheter is unsatisfactory in the long term as infection and bile loss are difficult to manage. (18).

Terblanche reported favourable results using the U-tube, with some patients surviving up to six years (19,20). This procedure involves the insertion of a wide-bore tube (16F gauge Argyl\* gastric tube) through the stricture. Side-holes are cut along the tube on either sides of the stricture and the proximal end of this tube is brought to the body surface via the liver substance while the distal end is brought out through the common bile duct. The ends of the tube are then connected outside the body to form a closed circuit. The tube has to be irrigated daily to maintain patency. However, it still gets blocked which then requires changing under general anaesthesia.

A variation of this technique is to pass the distal limb of the U-tube through the ampulla of Vater and brought out on the skin via the duodenum. (21) Leakage around the duodenal opening can be a problem and in one of our recent cases this eventually proved fatal. Our patients have generally found it difficult to manage an external tube.

Duodenoscopic placement of a biliary prosthesis, would be an ideal palliative procedure as it does not require general anaesthesia, and it can be readily repeated (22). This procedure is still at an early stage of evaluation. Complete obstruction and proximally situated obstruction, though, would be difficult to cannulate endoscopically.

During operation, it is sometimes not possible to expose the porta-hepatis because of extensive metastasis, especially in the presence of adhesions from previous surgery. Sometimes, it is not possible to cannulate a dense malignant stricture. Retrograde drainage via a dilated intrahepatic duct becomes the only alternative for decompressing the obstructed biliary system. Longmire has shown that for biliary obstruction in an otherwise normal liver, decompression of one of the lobes is adequate to maintain normal liver function. (23)

By adapting the Longmire's operation for the right lobe of liver, it is easier to find a dilated intrahepatic duct. Optimal ex-

posure is also brought about by lifting the right lobe of the liver to the wound and this helps in the suturing of a difficult anastomosis.

Our two patients had satisfactory palliation of their jaundice and pruritus. Case I had carcinoma of the stomach with secondaries in the porta-hepatis. Ragins and co-workers (24) suggested that cases with secondaries from the stomach, caecum, breast and lung should be excluded from any intrahepatic cholangiojejunostomy because of the fulminant nature of the disease. Among five cases who died within two months of their operation from their series of 10 cases were a case of carcinoma of stomach and the other of caecum. Our patient with gastric carcinoma had good relief of his distressing jaundice and pruritus before he succumbed four months later to his disease. We felt that his operation had been worthwhile.

In Case 2, the diagnosis of cholangiocarcinoma was made on percutaneous transhepatic cholangiography and operative findings, as biopsy of a surrounding lymph node showed only reactive hyperplasia. Because of the scirrhous nature of the lesion in the porta-hepatis, a positive biopsy is notoriously difficult to obtain (11,20,25). In a series published by Longmire (9), of 25 cases of proximal biliary duct carcinoma, only 8 gave positive tissue biopsy at the first operation. The chances of getting a positive biopsy can be improved by using a rigid choledochoscope with its biopsy attachment (20) or a sharp curette (26). Terblanche and Louw have emphasized that even in the absence of a positive biopsy, a clinical diagnosis must be made so that worthwhile palliation can be carried out. (27) Others have advocated that extensive curative resection based on a clinical diagnosis, should be embarked upon, even in the absence of a positive biopsy (9).

In Case II, six days after the drainage procedure, the serum alkaline phosphatase level rose dramatically from 565 to 1080 U/L despite a fall in the bilirubin from 22.5 to 4.4 mg/dL. This phenomenon has been observed in 4 cases of resection with jejunobiliary anastomosis done for benign biliary stricture (unpublished data). The enzyme level usually returns to normal within 3 months. This is thought to be due to residual partial biliary obstruction (11).

Cholangiocarcinoma is a slow-growing tumour that metastasizes late. When radical excision is not possible, prolonged survival has been seen after effective biliary decompression. Modified Longmire's operation in a safe and effective method of providing biliary drainage without a permanent external tube. It is particularly useful when the porta-hepatis is blocked by secondary deposits. In all cases of proximal extrahepatic duct obstruction operation should be undertaken as patients can benefit greatly with relief of their jaundice and pruritus.

## ACKNOWLEDGEMENT

We are grateful to Dr. KS Khong of Toa Payoh Hospital, Singapore, for the illustrations in Figs. 1 & 2.

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