Case reports

Expectant management of patients with unilateral hepatic duct stricture and liver atrophy

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SUMMARY Three patients with postcholecystectomy unilateral hepatic duct stricture and subsequent liver atrophy were treated conservatively, with a successful outcome of up to three years follow up. A better understanding of the pathophysiological sequelae of segmental hepatic duct obstruction suggests that in such circumstances reconstructive surgery, with its attendant risks, may not invariably be necessary.

Unilateral hepatic duct obstruction, though uncommon, usually follows impaction of a stone¹ or is the result of an injury sustained during biliary surgery.² Less common causes include a hilar cholangiocarcinoma originating in one hepatic duct and diagnosed before the development of jaundice.³ In this case, if possible, removal of the tumour by local excision or liver resection is indicated.⁴ In contrast, guidelines for the management of patients with benign causes of unilateral hepatic duct obstruction are lacking. Failure to appreciate the natural history of lobar or segmental duct obstruction, and its sequelae, may be partly responsible for this. We report three patients with benign hepatic duct stricture and liver atrophy treated expectantly.

From January 1979 to December 1984, 95 patients with postcholecystectomy bile duct stricture were referred for assessment to the Hepatobiliary Unit at Hammersmith Hospital. Of these 95 patients three had unilateral hepatic duct stricture and liver atrophy (defined as a reduction in the volume of a lobe or segment by more than 50% and irrespective of the microscopic features) and are the subject of this report.

Expectant management encompasses active, non-surgical treatment of symptoms, at home or at the hospital, and a regular and indefinite follow up.

Case 1

A 69 year old man underwent elective cholecystectomy in July 1975 during which the common hepatic duct was divided and immediately repaired over a T-tube. Progressively increasing jaundice developed necessitating re-exploration in September 1975 at which time separate anastomoses of the right and left hepatic ducts were constructed to a Roux-en-Y loop of jejunum. In the ensuing years he experienced periodic episodes of right upper quadrant pain, fever and rigors responding promptly to antibiotics. On admission to the Hammersmith Hospital in 1982 he looked fit and well. The liver was palpable over the epigastrium, with no splenomegaly. Haematological and biochemical evaluation was completely normal. Ultrasonography showed no dilatation of intrahepatic ducts. Percutaneous transhepatic cholangiography revealed a stricture of the right hepatic duct and a large left lobe with normal biliary drainage (Fig. 1). No stones were shown. HIDA scan showed an atrophied right lobe and a normally functioning left lobe (Fig. 2). Computed tomography confirmed this and showed considerable hypertrophy on the left (Fig. 3).

In view of the patient's age, infrequent attacks of cholangitis responding adequately to treatment with oral antibiotics, and a functionally normal left lobe a conservative policy of management was adopted. In the last three years he has been totally asymptomatic.

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Fig. 1 Percutaneous cholangiography:
(a) Crowding of the intrahepatic ducts in
the right lobe indicative of liver atrophy.
(b) Hypertrophy of the left lobe with
normal drainage.

Fig. 2 ^{99}Tc -HIDA scan at 15 minutes. The right lobe is nearly absent. There is normal uptake and excretion by the hypertrophied left lobe.

Case 2

A 70 year old woman had a cholecystectomy in 1971 at which time the right hepatic duct was inadvertently divided and a right hepaticojejunostomy was fashioned to a Roux-en-Y loop. In the subsequent years she suffered from recurrent attacks of right subcostal pain, bilious vomiting, and rigors with no jaundice. On referral to Hammersmith Hospital for assessment, in 1980, she looked fit and well nourished. Abdominal examination revealed no abnormality; haematological and biochemical investigations were normal. Percutaneous transhepatic cholangiography showed a normal left sided system but it was impossible to enter the right ducts. A colloid liver scan showed a small right lobe and considerable hypertrophy of the left lobe. In view of her age and because previous episodes of cholangitis had not been treated with antibiotics, expectant management was decided upon. The patient has remained well in the last three years.

Case 3

A 39 year old woman underwent elective cholecys-

Fig. 3 CT scan showing a very small right lobe and gross hypertrophy of the quadrato lobe and left lateral segment 'embracing' the spleen.

tectomy in March 1983. Two weeks after discharge from hospital she developed shoulder tip pain and a subphrenic collection of bile required drainage. This was complicated by the development of a biliary fistula and subsequent fistulogram showed filling of the right ductal system only while endoscopic retrograde cholangiography showed only the left system. The patient continued to complain of right subcostal pain and in December 1983 percutaneous transhepatic cholangiography revealed dilated right ducts with no opacification of the left system which subsequently appeared normal after a separate puncture required for visualisation.

On admission to the Hammersmith Hospital for assessment she was afebrile, looked well and was not jaundiced; there was no visceromegaly. Laboratory tests were normal with the exception of a raised alkaline phosphatase 550 IU/l (N30–130). Ultrasound scan showed dilatation of the right ducts with

a normal calibre common bile duct. Computed tomography revealed a perihepatic collection and segmental atrophy of the right lobe. HIDA scan showed normal uptake and excretion in the left lobe with slightly delayed excretion on the right. Percutaneous transhepatic cholangiography showed an atrophic posterolateral segment in the right lobe and a normal left biliary system. In April 1984 a subcapsular haematoma over the right lobe of the liver was evacuated promptly relieving the shoulder tip pain. Two weeks later, however, she complained of a persistent irritating pain in the right upper quadrant and right flank not associated with cholangitis or jaundice. The pain continued although investigation of the biliary tree yielded no new abnormality to which symptoms could be attributed. Clinical examination and laboratory evaluation were normal except for a persistently high alkaline phosphatase and these new symptoms were interpreted as probably being neuromuscular in origin.

Discussion

Postcholecystectomy bile duct strictures and particularly those with an inadequate first repair tend to involve the hilar bifurcation and are usually symptomatic with abnormal liver function tests.^{5,6} The severity of symptoms and the likelihood of progressive liver fibrosis and liver failure dictate early reconstructive surgery. The methods of repair and the results achieved have been reviewed recently.^{5,6} By contrast, the natural history and clinical course of unilateral hepatic duct stricture are not well documented. The current consensus, after conflicting early reports, is that lobar or segmental duct obstruction in man results in atrophy of the affected liver and compensatory hypertrophy of the contralateral lobe^{7,8} giving rise to the atrophy/hypertrophy complex.⁹ The clinical counterpart of this pathological process is that the patient may be entirely asymptomatic.^{7,8} Such a view is supported by the fact that although the incidence of atrophy (indicating unilateral hepatic duct obstruction) in hilar cholangiocarcinoma is about 20%,¹⁰ nearly all patients present after the contralateral hepatic duct has also become obstructed and jaundice has developed.¹¹

Most patients presenting with cholangiocarcinoma have sterile bile before intervention¹² and presentation of cases with cholangitis is distinctly uncommon.¹¹ Patients with stricture secondary to choledocholithiasis or surgical trauma, however, commonly have infected bile¹³ and many experience recurrent upper abdominal pain, fever, and rigors. Management should be based on the pathological facts referred to; mild episodes of cholangitis and

pain are effectively controlled with oral antibiotics and analgesics and frequently resolve completely. With continuing symptoms, however, other causes, particularly of pain, must be excluded. Investigations aim at confirming that the unaffected lobe functions normally and that there is no obstruction. Intrahepatic abscess formation and extrahepatic collections should be excluded. Depending on the diagnostic facilities available, ultrasound, computed tomography and HIDA scans usually provide these answers and establish the diagnosis of liver atrophy.⁹ Percutaneous transhepatic cholangiography, though informative, may not always be necessary and expected benefits should be weighed against possible complications of the procedure. Occasionally, liver biopsy may be required in the absence of demonstrable obstruction in a symptomatic patient to exclude chronic cholangitis in one or other lobe.

Although advocated by some,¹ lobar atrophy secondary to bile duct obstruction is not an absolute indication for liver resection or ductal reconstruction except for the development of multiple cholangitic abscesses resistant to conservative treatment or of obstruction of the contralateral hepatic duct. The operative problems are considerable, particularly with right lobe atrophy, and arise from marked distortion of the configuration of the liver and the altered anatomical relations of vascular and ductal structures in association with the atrophy/hypertrophy complex.⁹ Intervention may be necessary, however, in the presence of multiple stones, associated with refractory symptoms, in the atrophic lobe. In such circumstances interventional radiological techniques alone or in combination with conservative surgery to facilitate initial negotiation of the distorted anatomy offer optimum treatment. The discord between such an approach and previous reports^{8,14,15} on the place of liver resection in the management of unilateral hepatic duct obstruction stems primarily from the absence of the atrophy/hypertrophy complex in the latter cases, the progress made in interventional radiology, and a better understanding of the pathophysiological sequelae of segmental biliary obstruction.

Finally, our cases raise the question of the management of injury to a segmental or lobar duct during cholecystectomy. Many authors, by warning of the serious consequences of such injury,¹⁶ have implied or stated that reconstruction is imperative.¹⁷ In view of the evidence presented here and elsewhere^{3,7,8} that lobar duct obstruction is not associated with jaundice and can be asymptomatic, re-examination of the premises on which reconstruction was advocated is warranted. Furthermore, potential complications of surgery, the prospect of

an uncertain outcome of reconstructive surgery and the risk of introducing infection together with such factors as the size of the duct and available surgical expertise, are aspects to be considered before embarking on repair. Expectant management of patients having had an inadvertent injury to a segmental hepatic duct may be preferable to attempts at the re-establishment of anatomical integrity.

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