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ORIGINAL ARTICLE

EVALUATION OF THE SURGICAL REVISION OF HEPATICOJEJUNOSTOMY STRICTURE AFTER FAILURE OF METAL ENDOPROSTHESIS

Samir Amaar
Surgery Department, Assiut University Hospitals, Egypt

Email: samirahmed70@hotmail.com

Abstract

Objective: Hepaticojejunostomy stricture could lead to long-term complication such as hepaticodocholithiasis, cholangitis, liver abscess formation, secondary biliary cirrhosis and portal hypertension. The objective of this study is to evaluate feasibility and safety of revision hepaticojejunostomy after failure of metal stent.

Methods: Revision of hepaticojejunostomy stricture after failure of metal endoprosthesis was done for 16 patients from February 2004 to May 2010. All patients presented by recurrence of symptoms and signs of biliary obstruction after percutanous management.

Results: The study group consisted of 12 females and 4 males. The mean age was 35.4 (range 22–60) years. The duration of metal stent prior to attempted revision ranged from 6 to 36 months. Fourteen patients were followed up for a mean period of 32.6 (range 12–60) months. Twelve patients had excellent results; they never had jaundice or cholangitis. Two patients had good results with attacks of cholangitis at 13, 16 months after operation and both of them respond to conservative management within 72 hours.

Conclusion: Surgical revision of hepaticojejunostomy after failure of metal endoprothesis is feasible and safe. Surgical revision is recommended from the start in such benign condition to avoid complication of metal stents.

Keywords: Hepaticojejunostomy, Metal stent, Stricture, Revision, Biliary obstruction.

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INTRODUCTION

Bile duct injury following cholecystectomy is an iatrogenic catastrophe associated with significant perioperative morbidity and mortality, reduced long-term survival and quality of life,[1-4] and high rates of subsequent litigation. Roux-en-Y hepaticojejunostomy (HJ) is considered as the definitive treatment for

iatrogenic bile duct injuries.[5] Studies have shown good medium and long-term outcomes following this procedure.[6,7] Post-operative stricture formation at the anastomotic site is shown to occur in 4–38% of patients.[8-13]

Untreated HJ stricture could lead to long-term complication such as hepaticodocholithiasis, cholangitis, liver abscess formation, secondary biliary cirrhosis and portal hypertension.[14] Biliary endoprosthesis, either metal or plastic, placed transhepatically has shown poor long-term results with high occlusion rates.[15]

Apparently, it is a great surgical challenge to handle anastomotic stricture of HJ after failure of percutaneous management. The objective of this study is to evaluate feasibility and safety of revision of HJ after failure of metal stent (MS).

PATIENTS AND METHODS

This study is a descriptive study of all cases of redo of HJ stricture, after failure of pecutaneous MS, admitted to Surgery Department- Assiut University Hospital, in the period from February 2004 to May 2010. Patients with iatrogenic bile ducts injuries (Fig. 1) were referred from various hospitals and clinics in Upper Egypt to Assiut University Hospital. Injuries were classified according to their location on the basis of modified Bismuth classification.[16]

Surgical management was done according to time of recognition of biliary injury, as well as level and nature of injury. Surgical intervention included drainage, primary repair or Roux- en -Y HJ. Stricture after HJ (Fig. 2) was managed with percutaneous transhepatic dilatation and internal stenting (Fig. 3). All patients presented by recurrence of symptoms and signs of biliary obstruction (jaundice, abdominal pain, itching, fever with chills and rigors and change of color of urine) after percutanous management by MS and fit for surgery were included in this study. All patients were clinically evaluated and subjected to routine laboratory investigations as well as abdominal ultrasonography and magnetic resonance cholangiography.

Surgical technique: Identification of the site of bilioenteric anastomosis was aided by the presence of the MS. The anastomosis was freed carefully from any adhesions. Dissection of the hilar plate was done, if needed, to access the left duct system. Exposure is more reliable after incision at the base of quadrate lobe of the liver to lower the hilar plate. The bile ducts proximal to anastomotic stricture was usually markedly dilated (Fig. 4) and filled with sludge/stone. Sometimes the bile ducts were distended with pus (Fig. 5). After opening of the anastomosis, MS was extracted (Fig. 6) and stones/pus/sludge were evacuated (Fig. 7).

Stricture was then excised to obtain a cuff of healthy proximal ductal mucosa (Fig. 8). Because of ductal dilatation, a suitable duct length was obtained outside hepatic parenchyma in all cases to perform tension free mucosa to mucosa anastomosis without the need to incise the parenchyma to isolate the ducts within the liver. Single layer interrupted end to side biliary–enteric anastomosis was performed with 3/0 polyglactin.

Stitches were placed on the posterior wall first; the anterior wall was then completed. No transanastomotic catheters were used in any of the patients.

All patients were followed up for clinical, biochemical, and radiological evidence of anastomotic site occlusion and the need for re-intervention at 3, 6, and 12 months and annually thereafter. Outcome was defined as excellent if the patients never had jaundice or cholangitis, good if the patient develop jaundice or cholangitis at some time during the follow up period but was symptoms free for longer than 12 months after operation; or poor if the patients did not satisfy the above criteria.[10,17]

RESULTS

The study included 16 revision HJ, 12 females and 4 males. The mean age was 35.4 (range 22–60) years. All patients developed evidence of HJ stricture within 24 months of previous reconstructive surgery and treated by interventional percutaneous MS. The duration of MS prior to attempted revision was ranged from 6 to 36 months. Fourteen patients were followed up for a mean period of 32.6 (range 12–60) months. Two patients were lost for the follow up. Based on Bismuth classification, 3 patients had type I, 9 patients had type II, and 4 patients had type III. One patient developed leakage at the biliary-enteric anastomosis and underwent corrective surgery within 48 hours with good results. Regarding postoperative outcome, twelve patients (85.7%) had excellent results; they never had jaundice or cholangitis. Two patients (14.3%) had good results with attacks of cholangitis at 13, 16 months after operation and both of them respond to conservative management within 72 hours. Regarding patients with postoperative cholangitis after surgical revision, one had leakage of HJ in the first 48 hours after surgery and the other had severe ascending cholangitis with the bile ducts proximal to anastomotic stricture were distended with frank pus (Fig. 5). The conservative management of postoperative cholangitis consisted of antibiotic, with gram-negative bacilli coverage, and supportive measures such as fluid therapy and monitoring. Response is usually measured by improvement of clinical signs, normalizing liver function tests, and subjective improvement.

Fig 1. Percutaneous Transhepatic Cholangiography showing ligated hepatic duct with dilatation of the bile ducts proximal to it.

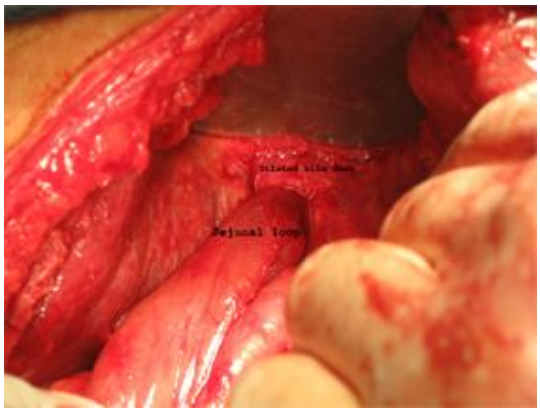

Fig 4. Operative view showing marked dilatation of bile ducts proximal to anastomotic stricture.

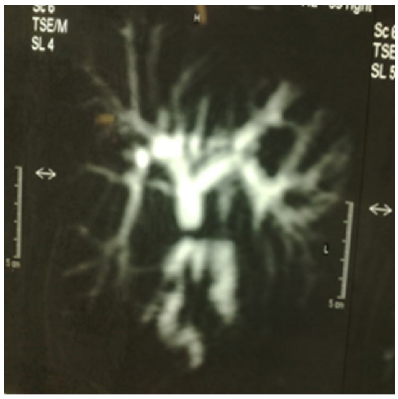

Fig 2. Magnetic Resonance Cholangiography showing stricture after hepaticojejunostomy with intra-hepatic biliary channels dilataion.

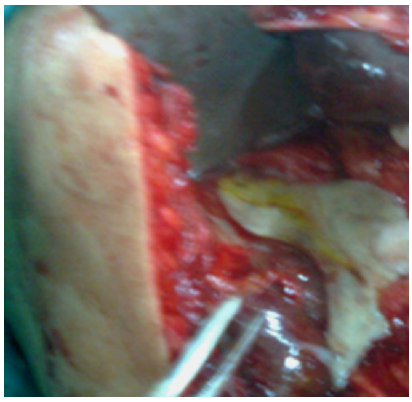

Fig. 5. Drainage of pus proximal to anastomotic stricture in a case of severe ascending cholangitis.

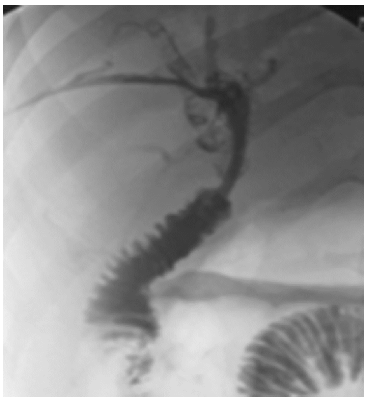

Fig 3. Percutaneous Transhepatic Cholangiogram showing internal stenting of anastomotic stricture after hepaticojejunostomy.

Fig 6. Metal stent after its extraction from bile ducts.

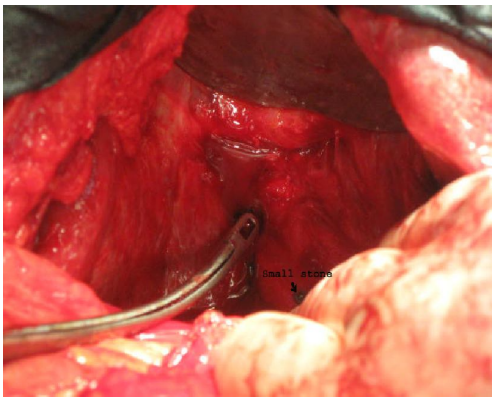

Fig 7. Stone evacuation from bile ducts proximal to anastomotic stricture.

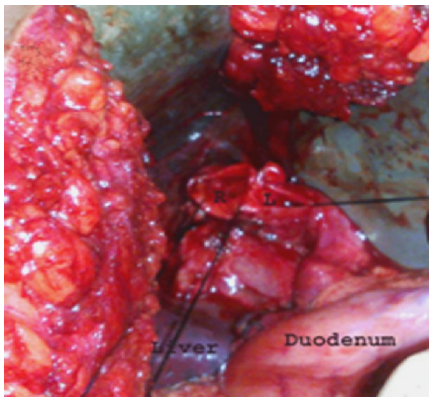

Fig 8. Healthy mucosa and wide lumen of the right and left hepatic ducts after excision of scar tissue.

DISCUSSION

HJ is a common operation, not only to by-pass extrahepatic biliary obstructions, but also to establish biliary-enteric continuity after resections for benign and malignant diseases. In most cases, biliary reconstruction is considered to afford satisfactory long-term outcome with no symptoms or rise of the serum liver values. However, 4 to 38% of patients have been reported to develop anastomotic strictures leading to the need for subsequent treatment with percutaneous transhepatic dilation, endoscopic dilation, or operative revision.[8-13]

In this study, all patients developed evidence of HJ stricture within 24 months of previous reconstructive surgery.

Bismuth level of the injury, revision surgery, non-dilated proximal biliary system, vascular injury, suboptimal anastomosis and electrocautery damage are implicated in the occurrence of anastomotic stricture.[10,14,18]

Therefore, the genesis of anastomotic stricture is complex and multifactorial; and relationship to a particular risk factor cannot be established with certainty.[19]

Percutaneous treatment of benign biliary duct strictures is performed relatively less often in comparison to palliative treatment of malignant ones.[20] Biliary endoprosthesis, either metal or plastic, placed endoscopically or transhepatically should, in general, be avoided in patients with benign biliary strictures because of poor long-term results with high occlusion rates.[21]

Biliary endoprosthesis should be reserved for those patients who have underlying malignancies and limited life expectancy or only as a last resort in those patients who have no options available (ie, are extremely poor surgical candidates).[22]

The most common late complication of biliary MS is stent occlusion. MS occlude as a result of food impaction or biliary sludge, tumor ingrowth, and mucosal hyperplasia.[21] The occluded MS placed for postoperative stricture of bilioenteric anastomosis can be treated with percutaneous interventional procedures.

Options for management of occlusion of MS include mechanical clearance of the obstruction by using baskets or balloons, insertion of a plastic stent within the MS, or deployment of another MS.[22] Most MS eventually re-occlude after a certain period of time with sludge/stone or epithelial hyperplasia. In this study, the duration of metal stent prior to surgical revision was ranged from 6 to 36 months. The complete removal of MS is, therefore required for a good long-term outcome.

Surgical procedures with MS removal, and re-bilioenteric anastomosis after resection of damaged bile ducts, are usually complex and difficult, especially when the proximal end of the MS is located at the second or more proximal biliary branches.[23] In the present study, 3 patients had Bismuth type I, 9 patients had type II, 4 patients had type III, and none of the patients had type IV or V injuries. Consequently, there was no difficulty in removal of MS and redo of HJ.

Patients usually prefer percutaneous treatment over surgical correction of HJ stricture because of the magnitude of surgical trauma of the original bile duct injury and its surgical correction. In the original operation of HJ, the patients were in bad general condition, the bile ducts not dilated, the extent of ischemic injury in the suffered duct is less apparent and the anastomoses were difficult to perform with narrow stoma. The previous factors predispose to anastomotic stricture of HJ.

During revision of HJ after failure of MS, the bile ducts were markedly dilated due to biliary obstruction, the

extent of ischemic injury in the suffered duct is apparent and, and the anastomoses were in most cases comparatively easy to constitute. Consequently, tension free, wide stoma, mucosa to mucosa bilioenteric anastomosis is possible, which in turn minimizes the risk for postoperative complication and improve the outcome. In this study, 12 patients (85.7%) had excellent results and 2 patients (14.3%) had good results. Yan et al observed similar results with no significant complications at a median follow up of 10 months after surgical revision of HJ for bile ducts injury in six patients[24]. In another study, Hwang et al reported no recurrent biliary stricture occurring during mean follow up of 40 months for 4 patients underwent redo HJ.[25]

In conclusion after failure of metal endoprothesis for treatment of HJ stricture, surgical revision is feasible and safe. Surgical revision for HJ stricture should be done from the start in such benign condition to avoid complication of MS. MS should be recommended only for poor surgical risk patients or as a last resort.

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