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IATROGENIC BILE DUCT INJURIES REQUIRING SURGICAL RECONSTRUCTION - PRESENTATION AND CLASSIFICATION OF THE LESIONS, THEIR RECONSTRUCTION AND OUTCOMES

Surgery

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ABSTRACT

INTRODUCTION: Iatrogenic bile duct injury during cholecystectomy is associated with high morbidity and is a potentially life-threatening complication. The aim of the study was to assess the outcomes following.

METHODS: All patients who presented with bile duct injury following both open and lap cholecystectomy from January 2013 to April 2018 were included. Excluded patients treated with endoscopic stenting alone.

RESULTS: 20 patients were included in the study. Roux en Y hepaticojejunostomy was done in 18 patients. On follow up, 1 patient with Type III stricture developed anastomotic stricture which was managed with Transhepatic stricture dilation. Outcome was graded into grade A in 14 (77.78%) patients, grade B in 2 (11.11%) patient and grade D in 1(5.56%) patient. Mortality in one (5.56%) patient following hepaticojejunostomy due to renal failure.

CONCLUSION: Management of post cholecystectomy biliary injuries is based on presentation. Most of these require Hepaticojejustomy. Outcomes following hepaticojejunostomy are good but require longterm surveillance.

KEYWORDS

Bile duct injury, Post cholecystectomy, Hepaticojejunostomy

INTRODUCTION:

Iatrogenic bile duct injury during cholecystectomy is associated with high morbidity and is a potentially life-threatening complication with major implications for the patient outcome.

The true incidence of biliary injury after these procedures is difficult to assess because many cases go unreported in the literature. The rate of biliary duct injuries requiring surgical reconstruction is between 0.3−0.7percent. Biliary reconstruction in the hands of a hepatobiliary surgeon may prompt better short-and long term results in patients with this rare, however genuine complication.[1]

The aim of the study was to assess the outcomes following Hepaticojejunostomy for post cholecystectomy bile duct strictures or fistulas.

METHODS: All patients who presented to sri venketeswara institute of medical sciences with bile duct injury following both open and lap cholecystectomies from January 2013 to April 2019 were included in the study.

Medical records of these patients were retrospectively reviewed and data regarding patient characteristics, type of injuries, time to referral, management prior to and after referral and the long term outcome were analysed.

Bile duct injuries were classified using MRI cholangiography, CT Abdomen, ERCP in patients accordingly. Bile duct injuries categorized according to Strasberg classification. Patients who do not require operative intervention or those who were treated with endoscopic intervention alone were excluded from study.

All patients with major bile duct injuries were treated by Roux-en-Y hepaticojejunostomy. In all our patients final diameter of Hepaticojejunostomy was more than or equal to 1.5 cm.

The median follow-up period was 8.3 months (range, 6- 48). Postoperatively patients were reviewed at every 4 months for initial 1 year and yearly thereafter. Follow up consisted of clinical examination, liver function tests and abdominal ultrasound. If any of these tests raise the suspicion of a bile duct stenosis then a magnetic resonance cholangiopancreaticography (MRCP) is performed.

Outcomes were assessed using MacDonald classification.[2]

MACDONALD CLASSIFICATION	
Grade A	Normal Liver function, Asymptomatic
Grade B	Mild Elevetion of LFT, Asymptomatic
Grade C	Abnormal LFT, Cholangitis, Pain
Grade D	Surgical revision or dilatation required

Grade A or B were considered good outcomes and poor if grade C or D were reported.

RESULTS: 20 patients were included in the study. Of these, 12 were females and 8 were males. The mean age was 42 years (range 24 – 68 years). 15 had injury following Laparoscopic cholecystectomy whereas 5 had following lap conversion / open cholecystectomy.

Three (15%) presented with biliary peritonitis, 9(45%) with controlled biliary fistula initially or following imaging guided percutaneous drainage and 8 (40%) with biliary stricture.

Five (25%) had type IV injury, 9 (50%) had type III, 3 (16%) had level II injury and one patient had tyoe I injury. In 2 patients, level of injury not assessed. Two patients (11%) had associated vascular injury.

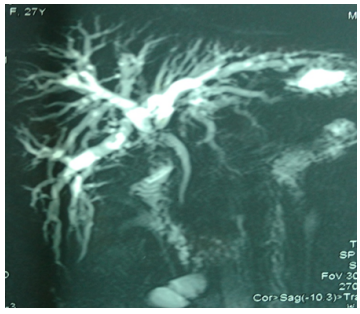

Image: Type 3 biliary stricture

All 3 with peritonitis underwent lap or open peritoneal lavage and subhepatic drain placement. Two of these 3 patients had spontaneous closure of biliary fistula. 1 patient developed Type II stricture and required hepaticojejunostomy. Of 9 with biliary fistula, 5 had subhepatic collections for which USG guided PCD placed and 3 had

intraoperatively placed drain with controlled fistula and 1 patient had relaparotomy and drain placement. Of these 5 had persistent fistula and other 3 fistula converted to stricture. Of 8 patients presented with stricture, 6 had recurrent cholangitis. 3 patients not responding to Antibiotics required PTBD. One patient had laparotomy and external biliary drainage, later developed stricture. All patients with fistula and stricture underwent Roux-En-Y hepaticojejunostomy.

Roux en Y hepaticojejunostomy was done in 18 patients. On follow up, 1 patient with Type III stricture developed anastomotic stricture which was managed with Transhepatic stricture dilation. Outcome was graded into grade A in 14 (77.78%) patients, grade B in 2 (11.11%) patient and grade D in 1(5.56%) patient. Mortality in one (5.56%) patient following Hepaticojejunostomy was due to renal failure.

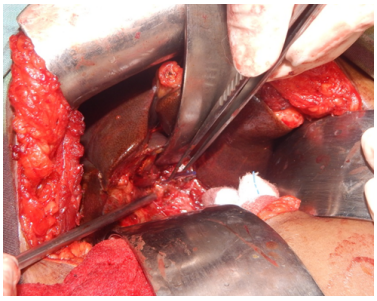

Image: Type 3 Biliary injury

Outcome	Hepatico jejunostomy
Grade A	14
Grade B	2
Grade C	0
Grade D	1
Total	17

DISCUSSION:

Although bile duct injuries can occur during various surgical procedures such as gastrectomy, hepatectomy, or portocaval shunt, 80% of the injuries develop during biliary tract surgery, especially cholecystectomy. Although not statistically significant, Biliary injury during laparoscopic cholecystectomy is twice as frequent compared to injuries during an open procedure (0.3% open vs 0.6% laparoscopic).[1] The injury is usually recognized either during the procedure (25% to 30%) or, more commonly, in the early postoperative period.[3]

Early presentation:

1. Progressive elevation of liver function test results, particularly total bilirubin and alkaline phosphatase levels
2. Leakage of bile from the injured bile duct: Bilious drainage from operatively placed drains or through the wound or bile can leak freely into the peritoneal cavity causing generalized peritonitis or it can loculate as a collection resulting in subphrenic or subhepatic abscess.

Late presentation: Who present months to years after the initial operation frequently may present with evidence of cholangitis or less commonly, patients may present with painless jaundice and no evidence of sepsis. Patient may present with nonspecific complaints of weakness, fatigue, or anorexia. Rarely patients with markedly delayed diagnoses may present with advanced biliary cirrhosis and its complications.

Pathologic consequences of external biliary fistulae: Depletion of electrolytes and fluid causes metabolic acidosis, low-output renal failure, and hyperkalemia. Absence of bile from the gut interferes with the absorption of fat-soluble vitamins. In delayed presentation, caloric and protein malnutrition results in gradual weight loss.[4]

Surgical Treatment: The definition of early, intermediate or late repair of BDI varies much in the literature.

Ajay K. Sahajpal et al, 2010 did retrospective medical record review of 69 patients who underwent repair after post lap. Cholecystectomy bile duct injuries. Injuries were classified into 3 groups based on timing of repair from time of injury: Immediate repair (0-72 hours of LC), Intermediate (between72 hours and 6weeks after LC) and Late (after 6weeks). Repairs in the intermediate period were significantly associated with biliary stricture. Thus, repairs should be undertaken either in the immediate (0-72 hours) or delayed (>6 weeks) periods.[5]

Philip R. de Reuver et al, 2007 did a retrospective study of 500 patients. Out of 500, 151 patients underwent reconstructive surgery. They concluded that acute repair (<6 weeks) is independent negative predictor on outcome after reconstructive surgery for bile duct injury. In our study group, all the repairs were after 6 weeks of initial injury.[6]

Male gender has been shown by Booij et al, 2018 to be the only risk factor for stricture formation after hepaticojejunostomy. This is in line with the results of this study the only patient in our study which developed stricture was male.[7]

Concomitant vascular injuries have been reported in 10–47% of bile duct injuries.[8] Our study has 11% incidence of vascular injury. But as per other studies, no impact of vascular injury on the severe postoperative complications or the patency of the hepaticojejunostomy could be demonstrated.

A limitation of this study is its retrospective design and relative short follow-up. As well as in our center we follow late repair of bile duct injury so the impact of timing of repair needs a large multicentric study.

CONCLUSION:

Management of post cholecystectomy biliary injuries is based on presentation. Most of the patients with major bile duct injury require Hepaticojejustomy. Outcomes following hepaticojejunostomy are good but require long term surveillance.

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