



Research Article

Iatrogenic Bile Duct Injuries: Repairs Feasibility

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Abstract

Due to laparoscopic cholecystectomy there is increase in the bile duct injuries. It was 0.2% to 0.4% during open opposed to 0.6% to 0.8% during laparoscopic. Included in the study were 22 patients, 19 patients with two redo operated upon. Between Feb. 1999 to Nov2017 and 3 referral cases. The treatment options were end to end anastomosis and hepaticojejunostomy. Regarding the injuries, according to Stresberg there were 2A .4D injuries with injury in the lateral aspect of the ducts, 8 E1, with hepatic stump > 2cm., 5 E2 with hepatic stump < 2cm. The three referral cases were choledochodoudonostomy E1, and E2. They were treated with si ligation of cystic in two cases, anastomosis in seven cases. The remaining fifteen cases with hepaticojejunostomy .Conclusions: The risk is more proximally. After complex injuries diversion is the best while with simple end to end was acceptable. The insertion of stents has to be individualized according to the situations of each patients and the experience of each surgeon.

Introduction

Iatrogenic bile duct injury is a challenge for the operating surgeon [1]. Bile duct injury, is a complex and serious complication, observed with a frequency of 0.2% to 0.4%. The frequency has not diminished and probably will not [2]. Less than half are recognized intraoperative, most are recognized postoperatively [3]. Many injury patterns, the first is mistaking the common bile duct for the cystic duct. The second when the distal clips are placed on the common bile duct, and the proximal clips on the cystic duct. The third is due to tenting of the common duct, the result is excision of a short segment of common duct [4].

Right hepatic ductal injury occurs with and without anatomic variation [5].

Bismuth [6] type 1, hepatic duct stump > 2cm, type 2, hepatic duct stump < 2m, type 3, hepatic duct, confluence intact, type 4, destruction of the hilar confluence, and type 5, right sectoral duct injury. Woods et al. [7]. 1 consists of cystic duct leaks, 2 major bile duct leaks, and 3 contains the major ductal insult. Strasberg et al. [3]. A, injury to small ducts, leak in the duct of Luschka or cystic. B, sectoral duct with obstruction. C sectoral duct with bile leak, Class D lateral injury E1 stricture more than 2cm. E2, stricture less than 2 cm. E3, stricture at the bifurcation E 4, insult to right and left bile ducts. Class E5, complete destruction. When the common hepatic or common bile duct has been ligated, simple deligation and placement of a T-tube, one limb of which goes through the area of the damage suffices [8-10].

Hepaticojejunostomy is the first option. End-to-end repair has a high failure rate [11]. Roux-en-Y jejunal loop is the best option for reconstruction [12]. Laparoscopic end-to-end choledochocholedochostomy is promising [13].

Patients and Methods

Between February 1999 and November 2017, 22 CBD injuries were operated upon. 20 patients were females and 2 were males with mean age of 48 years \pm SD of 4.6. These injuries were among a total number of 2874 of cholecystectomies among them there were 564 open cholecystectomy the others were laparoscopic.

The operative procedures

- A. T-tube placement, T-tube is inserted through a small separate stab in the lower segment then the two ends were reconstructed end-to-end [14].
- B. Roux-en-Y hepaticojejunostomy, 70 cm Roux-en-Y loop of jejunum is brought up to the site of the future anastomosis. End to side is done mucosa to mucosa [15].
- C. Straight stent when the ends are in the vicinity [16].

Results

22 patients were evaluated (Tables 1,2).

We did not mention any conservative treatment as we were assessing only repair feasibility, many patients were subjected to conservative management in the form of pig tail insertion in case of minimal leak, to others ERCP done with stenting to drain the biliary tree but not included in the current study as we are dealing with repair feasibility.

Discussion

Surgeons with experience with laparoscopic cholecystectomy have high rates of common bile duct injury [17,18]. Proximal bile duct is at greater risk [12].

Table 1: Patients Characteristics and Procedures

Access	Injury	Presentation	Classification	Repair	Mortality
Open	2	2 R.I.O.I.	2 E1	1 T-tube 1 Loop (Stent)	- -
Converted	9	8 R.I.O.I. 1 Leak	3 E1 5 E2 1A	3 Tubes 5 Loop +3 Stent Ligation	- -
Lap	8	4 Leak 4 Jaundice - 2 arly - 2 late	1A 3 E1 4D	Ligation 2 T-tube, 1 Tube 4Loop	- -
Referral	3	3Jaundice	Choledochoduodenostomy E1 E2	Loop Loop Loop	- - -
Redo	2	1 Leak 1 Jaundice	Loop Loop	Loop Loop	+ve
Total	24	10 R.I.O.I., 6 Leak, 8 Jaundice	2A, 4D, 9E1, 6E2, 2 Loop Choledochoduodenostomy	3 T-tube, 4 Tubes, 15 Loop, 2 Ligation	1

Table 2: Injury Classes Percentage.

Access	No	Types	Percent
Open	2	2 E1	100%
Lap	17	2A	11.7%
		4D	23.5%
		6 E1	35.2%
		5 E2	29.4%
Open + Lap	19	2A	10.5%
		4D	21%
		8 E1	42%
		5 E2	26.3%

Mostly injuries were recognized intraoperatively or soon after except two cases which were thought that they were due to partial clipping, this is supported by Jarnagin and Blumgart [12], who mentioned that some injuries evolve slowly or cause partial obstruction.

We got 2A -4D – 8 E1 – 5 E2 –accounting to 10.5% A – 21% D – 42% E1 – 26.3% E2. In the open group E1 account to 100% of injuries, while in laparoscopic injuries E1 was 35.2% and E2 was 29.4% this means that proximal bile ducts are at risk for injury. The same was with Jarnagin and Blumgart [12]. In the laparoscopic cholecystectomy patients there were 11.7% A – 23.5% D – 35.2% E1 – 29.4% E2, these was against Murr et al. [19], who reported E1 to be 8%, E2 27% and E3 42% .End to end if could be done for drainage is the best for future reconstruction [10].

Two cases with leaking stump were treated by ligation. The 4 cases with jaundice, subjected to hepaticojejunostomy.

The 8 cases with E1, 2 were in the open, 6 cases in the laparoscopic. One case in the open and two cases in lap-chole' were treated by end to end anastomosis over a T-tube, the other one in the open group was isolated right hepatic duct injury (IRHDI). That one treated with anastomosis over a stent. The other four were treated by end to end anastomosis over a straight stent avoiding the drawback of T –tube.

E2, there were 5 cases for Roux-en-Y, 3 stented. The same reported by Mercado et al. [20]. In case of ductal dilatation stents are omitted. It is use was according to the situations.

Whenever juniors operate there were more tissue loss and more ischemia [21]. In the near future all these injuries will be managed laparoscopically [22].

These injuries should be handled meticulously to decrease morbidity and mortality [23].

Conclusion

The risk is more proximally. After complex injuries diversion is the best while with simple end to end was acceptable. The insertion of stents has to be individualized according to the situations of each patients and the experience of each surgeon.

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