Journal of Saidu Medical College 2011; 1(2)

MANAGEMENT OF IATROGENIC BILE DUCT INJURIES: EXPERIENCE AT SAIDU TEACHING HOSPITAL SWAT

Samieullah[1], Tamjeed Gul[1],Muhammad Naseem Khan[2], Manzoor Ali[1], Naikzada Khan[1]
1.Department of Surgery, Saidu Teaching Hospital, Saidu Sharif, Swat.
2. Department of Radiodiagnosis and Imaging, Saidu Teaching Hospital, Saidu Sharif,

ABSTRACT

Objectives: To study the pattern of late presentation of iatrogenic bile duct injuries and to share our experiences in the management of these injuries at Saidu Teaching Hospital Swat.

Material and methods: This is a case series of fourteen cases of iatrogenic bile duct injury managed at the Department of Surgery; Saidu Teaching Hospital Swat from Jan 2003 till March 2007.We included iatrogenic bile duct injuries with delayed presentation in this study. Patients with hepatobiliary malignancy were excluded. The data was collected on a proforma and was analyzed on SPSS version 10.

Results: Total number of patients was fourteen. Ten patients were female and four were male. All the fourteen patients had developed iatrogenic biliary injury after open cholecystectomy. All the fourteen patients presented with abdominal pain, however twelve patients had jaundice, four had biliary leak and six had fever in addition to abdominal pain. Regarding the type of the injury, complete transection of bile duct and ligation of two ends at level of cystic duct was found in six (42%) cases; Tear in the bile duct in two (14%) patient, Bile leakage due to slippage of cystic duct ligature in two (14%) patients and Bile duct stricture in four cases (28%). Primary repair over a T-tube was performed in eight cases, Choledochoduodenostomy in two patients and Choledojujenostomy in four patients. We have recorded mortality in four (28%) of our patients. Our remaining patients are alive, healthy and under regular follow up.

Conclusion: Iatrogenic Bile duct injuries are rare but preventable entity and bears significant morbidity and mortality. Open surgery is an acceptable option in its management especially in the areas where minimal invasive therapeutic modalities are not available.

Key words: Bile duct injuries, Cholecystectomy, Iatrogenic.

INTRODUCTION

Cholecystectomy is the most common gastro-intestinal operation performed and since the introduction of laparoscopic surgery the number has increased further. Post cholecystectomy syndrome which is seen in as many as 20% cases of gallbladder surgery is manifested by symptoms of pain right hypochondrium, vomiting, jaundice, dyspepsia, and fever.[1] Iatrogenic bile duct lesions are serious complications during laparoscopic cholecystectomy and include biliary leakage and major bile duct injury. The incidence of biliary tract injury following laparoscopic cholecystectomy has been found up to threefold higher than that of open procedure.[2-3] The trends have changed now and elective laparoscopic cholecystectomy is established as the treatment of choice for symptomatic cholecystitis and is now proposed for the treatment of acute cholecystitis .[4-5]

The bile duct is prone to be damaged by use of diathermy and the excessive dissection, required to delineate the anatomy of Calot's triangle. This results in ischemic injury to the biliary tract.[6] Other risk factors include difficulty in dissection due to acute or severe chronic inflammation, morbid obesity, unexpected bleeding, and presence of anomalous duct or vessel [7]. These biliary injuries include leaks, strictures, transactions, or ligation of major bile duct. But various authors have advocated a distinction in bile leaks and bile injuries.[8] The pattern of bile duct injuries has changed and gct more complicated in recent years.[9] Certain preoperative steps and techniques have protective effects for these complications [10]. Magnetic resonance cholangiogram is the most sensitive and accurate test for the diagnosis of complications of cholecystectomy although percutaneous transhepatic cholangiography (PTC) has been considered preferred investigation.[11]

Journal of Saidu Medical College 2011; 1(2)

Other investigations in use are endoscopic retrograde cholengio pancreatogram ERCP and ultrasonography. Routine intra-operative cholangiography (IOC) may itself also cause bile duct injury if the anatomy in Calot's triangle is not clear.[11] On the other hand, IOC is helpful for defining anatomy and detecting bile duct stones; and even preventing, recognizing or decreasing the severity of biliary tract injury [12]. However, still many surgeons do not recommend routine intra-operative cholangiography for fear of injury.

The management of various complications consists of variety of interventional procedures including simple drainage to stricturoplasty, and others more complex procedures, like Roux-en-Y hepaticojejunostomy.[13]

The aim of our study was to record the pattern of late presentation of iatrogenic bile duct injuries and to share our experience in the management of these injuries at Saidu Teaching Hospital Swat

PATIENTS AND METHODS

This Study was a prospective case series, conducted at the Department of General & Urological Surgery, Saidu Teaching Hospital Swat from Jan 2003 till March 2007. A total of fourteen cases were collected during the study period by non probability convenient sampling. All the patients with iatrogenic common bile duct injuries with delayed presentation were included in the study. All patients who had iatrogenic bile duct injury were included, regardless of gender or age while patients with hepatobiliary malignancies were excluded from the study. Data regarding number of cases, gender, age, and type of procedure was collected on pre-designed proforma. Various investigations, like Ultrasound, Endoscopic retrograde cholangiopancreaticography (ERCP) and computed tomography (CT scan) were done for diagnosis of complications and type or site of the complication were also studied. Data showing the management strategies applied at that time were also collected. Later on data was analyzed on SPSS version 10.

RESULTS

Total number of patients was fourteen. Ten patients were female and four were male. All the patients had primary surgery elsewhere, and later presented at our department with iatrogenic bile duct injury. They had various complaints that started at a variable time after surgery. The median delay in the presentation to our unit and the first surgery was 45.3 days. The clinical presentations of the patients are shown in Figure No. 1

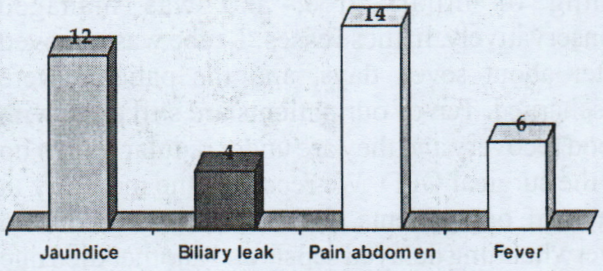


Fig 1: Clinical features of patients with iatrogenic biliary trauma

All the fourteen patients had developed iatrogenic biliary injury after open cholecystectomy. No case of laproscopic cholecystectomy was reported. The type and the site of the lesions are shown in Table No 1.

Table-1: Type or site of lesion

Site/Type of Lesion	No.	Percentage
Complete transection of bile duct	6	42.8%
Tear in the Common bile duct	2	14.28%
Cystic duct injury and leak	2	14.28%
Stricture	4	28.57%
Total:	**14**	**100**

For diagnosis, we used the Ultrasonography in all the fourteen cases, CT scan in four cases and Endoscopic retrograde cholangiopancreaticography (ERCP) was done in ten patients. These investigations showed the exact site of blockage of Common Bile Duct(CBD). ERCP was performed at another tertiary care hospital, as the facility is not available at Saidu Sharif. The type of surgical procedures employed in the management of these cases are shown in Table 2.

Journal of Saidu Medical College 2011; 1(2)

Table-2: Procedure employed for management

Procedure	No.	Percentage
Primary repair over a T-tube	8	57.14%
Choledochojujenostomy	4	28%
Choledochoduodenostomy	2	14%
Total:	**14**	**100%**

T-Tube cholangiogram of all the fourteen patients was carried out ten days after surgery. Four patients showed minor leakage with clear out lining of biliary tree, and was managed conservatively. In these cases, T-tube was removed after about seven days, and the patients were discharged. Ten of our patients are still alive with good recovery and they are under regular follow up in the surgical OPD. We recorded the mortality in three of our patients. Two patients died due to overwhelming delayed sepsis and another died due to severe hepatorenal syndrome as a complication of surgery.

DISCUSSION

Though preventable, iatrogenic biliary duct injuries are associated with significant morbidity and even mortality. The strength of our study is that it's probably the first study in the present setting that has addressed this relatively uncommon topic. The weaknesses of our study are the small sample size, lack of adequate hi-tech investigative and minimal invasive treatment modalities in our set up. The risk of bile duct injury during open cholecystectomy ranges from 0.10.2%. To begin with, laparoscopic cholecystectomy was associated with greater than 2% risk of injury to the biliary tract, but nowadays it has dropped to less than 0.5%, demonstrating that as the experience increases, the risk of injury drops.[6-14] Although Laparoscopic cholecystectomy is now considered the gold standard for uncomplicated gallstones[7]but in our study, all patients had developed biliary injuries during open cholecystectomy,as the facility of Laparoscopic cholecystectomy is not available in this area.

The best approach for these injuries is the prevention by careful surgical technique and this can easily be achieved by three "D" of Surgery and that is *Dissect, Demonstrate* and then *Divide*. If the injury occurs, the best moment to repair them is during surgery. If noticed after the operation, various surgical or endoscopic procedures, e.g., ERCP with papillotomy, stent placement, or bypass procedures, may be employed.[13-14-15]

Percutaneous transhepatic cholangiography (PTC) is another good investigation to delineate the anatomy of the biliary tract in a patient with a bile duct stricture after cholecystectomy. Recently magnetic resonance cholangiography (MRC) has been used to evaluate the obstructed biliary tract with all the inherent advantages over ERCP. We referred our ten patients to the Hayat Abad Medical Complex Peshawar for ERCP as above mentioned other two modalities are not widely available in our country.

Hepatico-jejunostomy is the gold standard procedure for repairing iatrogenic bile duct injuries [16]. Result have been classified into excellent outcome if the patient never experiences jaundice or cholangitis; good outcome if the patient develop symptoms, but subsequently has been asymptomatic for the following 12 months. This outcome has been shown to be commensurate with level of the injury, Bismuth level III and IV injuries requiring access loop.[17] Choledochoduodenostomy and Choledochojujenostomy are also other methods for the management of iatrogenic biliary duct injuries below cystic duct and have been associated with satisfactory outcome The over all operative success rate of present case series is according to the international literature.[15-16-18] The endoscopic management of iatrogenic biliary tract injuries is still anecdotal; however none of the case was dealt with such method. Drainage of post-cholecystectomy bilomas has been reported, but laparoscopic primary repair of biliary injury has not been mentioned.[19] We didn't have any billoma formation in our study. The reasons for the mortality as a sequele of biliary injuries are Sepsis, Coagulopathies, Hepatorenal syndrome, Hepatic failure, Excessive blood loss and even idiopathic

in limited cases.[1-5 6-10] In present case series two of our patients died due to sepsis and another due to hepatorenal syndrome.

CONCLUSION

We conclude from our study that, iatrogenic biliary tract injuries can be repaired with minimal morbidity and mortality in experienced hands.

REFERENCES

1. Ahrendt SA, Pitt HA. Biliary tract. In: CM Townsend. Sabiston Textbook of Surgery. WB Saunders Company, Philadephia, Pennsylvania. 2001: 1076-1111.
2. Neuhaus P, Schmidt SC, Hintze RE, Adler A, Veltzke W, Raakow R. Classification and treatment of bile duct injuries after laparoscopic cholecystectomy. Chirurg 2000; 71(2): 166-73.
3. Branum G, Schmitt C, Baillie J, Suhocki P, Baker M, Davidoff A. Management of major biliary complications after laparoscopic cholecystectomy. Ann of Surg 1993 ; 217: 532-41.
4. Idar S, Sabo E, Nash E, Abrahamson J, Matter I. Laparoscopic versus open cholecystectomy in acute cholecystitis Surg Laparosc Endosc 1997;7(5):407-14
5. Zacks SL, Sandler RS, Rutledge R, Brown RS. A population-based cohort study comparing laparoscopic cholecystectomy and open cholecystectomy. Am J Gastroenterol 2002;97(2):334-40
6. Pleas HCC, Garden OJ. Bile duct injury: prevention and management. Johnson CD, Taylor I. Ed. Recent Advances in Surgery. Churchill Livingston. 1998, 21:1-16.
7. Ahrendt SA, Pitt Ha. Surgical therapy of iatrogenic lesions of biliary tract. World J Surg 2001; 25(10)):1360-5
8. Azagra JS, De Simone P, Goergen M. Is there a place for laparoscopy in management of post cholecystectomy biliary injuries? World J Surg 2001; 25(10): 1331-4
9. Huang ZQ, Huang XQ. Changing patters of traumatic bile duct injuries: a review of forty years experience. World J Gastroenterol 2002;8(1):5-12
10. Fletcer DR, Hobbs MS, Tan P, Valinsky LJ, Hockey RL, Pikora TJ. Complications of cholecystectomy: risks of the laparoscopic approach and protective effect of operative cholangiography. Ann Surg 1999; 229(4):449-57
11. Chaudhary A, Negi SS, Puri SK, Narang P. Comparison of magnetic resonance cholangiography and percutaneous transhepatic cholangiography in the evaluation of bile duct strictures after cholecystectomy. Br J Surg 2002;89(4):433-6
12. Polat F R, Abci I, Coskun I, Uranues S. The importance of intraoperative Cholecystectomy. JSLS 2000; 4: 103-7.
13. Csendes A, Navarrete C, Burdiles P, Yarmuch J. Treatment of Common bile duct injuries during laparoscopic cholecystectomy: Endoscopy and surgical management World J Surg 2001;10:121-5
14. Raute M, Podlech P, Jaschke W, Manegold BC, Trede M, Chir B. Management of bile duct injuries and strictures following cholecystectomy. World J Surg 1993; 17: 553-62.
15. Sawaya DE Jr, Johnson LW, Sittig K, McDonald JC, Zibari GB. Iatrogenic and non iatrogenic extrahepatic biliary tract injuries: a multi-institutional review. Am Surg 2001; 67(5): 473-7
16. Jeffery S B, Gerald MF, Alan NB, Harvey HS, John EII, Jacob G. Cholecystectomy without operative Cholangiography. Ann of Surg 1993; 218: 371-9.
17. Al-Ghnaniem R, Benjamin IS. Long term outcome of hepaticojejunostomy with routine access loop formation following iatrogenic bile duct injury. Br J Surg 2002; 89(9): 1118-24.
18. Palacio-Ve'lez F, Casro-Mendoza A, Oliver Guerra AR. Results of 21 years of surgery for related iatrogenic bile duct injuries. Rev Gastroenterol Mex 2002;67(2): 76-81
19. Azagra JS, De Simone P, Goergen M. Is there a place for laparoscopy in management of post cholecystectomy biliary injuries? World J Surg 2001; 25(10): 1331-4

Dr. Samiullah
Dilaram Khan Memorial Complex
Near Nadra Office,
Saidu Sharif, Swat.
Ph: 0946-710080
Cell: 0300-5508844