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ORIGINAL ARTICLE

Experience of Treatment of Iatrogenic Bile Duct Injuries Following Laparoscopic Cholecystectomy in Tertiary Care Hospitals of Khyber Pukhtunkhwa

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ABSTRACT

Objective: This research aims to learn how often iatrogenic bile duct injuries caused during laparoscopic cholecystectomy are treated and how well they heal after surgery.

Study Design: A retrospective study

Place and Duration: General Surgery Department of different hospitals of Khyber Pukhtunkhwa i.e Bacha Khan Medical Complex, Swabi, Peshawar Institute of Medical Sciences, Peshawar and Naseer Teaching Hospital, Peshawar for duration of two years from February 2020 to January 2022.

Methods: In this research, 105 patients of both genders aged 18-68 years were enrolled. Included patients had iatrogenic bile duct injuries during laparoscopic cholecystectomy. Age, sex, place of residence, and body mass index were among the specific demographics of the enrolled cases that were calculated after receiving informed written consent. Strasberg classification was used to classify bile duct injuries. The outcome of treatment in all cases was measured in terms of effectiveness, complications, mortality and need for repeated treatment. SPSS 23.0 was used to analyze all data.

Results: Among 105 presented cases, there were 68 (64.8%) females and 37 (35.2%) males. The mean age of the patients was 55.2±6.30 years and mean BMI 23.8±4.19 kg/m^2. 55 (52.4%) patients were from urban areas. Most common symptom was epigastric pain, followed by fever, chills and jaundice. We found that Strasberg A was the most common injury found in 56 (53.3%) cases, followed by Strasberg D in 17 (16.2%) cases and Strasberg C in 12 (11.4%) cases. In all 105 cases, the majority of the patients received endoscopy in 67 (63.8%) cases and surgical treatment in 38 (36.2%) cases. Complications were bile leakage from the incision site, abdominal pain and bile leakage from the drain. Frequency of mortality was 4 (3.8%).

Conclusion: We concluded in this study that the iatrogenic bile duct injuries were effectively treated with endoscopy and surgical treatment by using Strasberg classification. There was higher effectiveness and the mortality rate was low.

Keywords: Iatrogenic Bile Duct Injury, Endoscopy, LC, Surgical, Mortality, Complications

INTRODUCTION

It is widely acknowledged that cholecystectomy is the most frequently performed abdominal operation worldwide. One percent to two percent of patients who have open cholecystectomy get bile duct damage (BDI). With the advent of laparoscopic cholecystectomy, the prevalence has increased to 0.4%-0.7% [1]. Some of these injuries are detectable during the first operation, but the vast majority only become apparent after the fact [2,3]. Injuries must be correctly diagnosed, treated at the right time, repaired using the right method, and performed by an experienced surgeon if these patients are to be successfully managed. Recent studies [4,5] have emphasised the need for repair by expert hepatobiliary surgeons as a key component to a positive BDI result.

For patients with gallstone disease, laparoscopic cholecystectomy (LC) is the recommended treatment, and it is one of the most frequently done routine treatments globally, in both elective and emergency situations [6]. Since the advent and widespread acceptance of laparoscopy, bile duct injuries (BDIs) have increased from 0.2% to 0.3% of patients in open cholecystectomy [7,8]; these injuries are serious consequences of cholecystectomy. It has been reported that the incidence of BDIs has decreased with time during LC from the first observations. However, modern injuries are more severe, with most serious biliary and hepatic artery or portal vein injuries occurring following conversion from laparoscopy to open cholecystectomy [9].

Morbidity, mortality (up to 3.5%), and reduced long-term quality of life are all factors that patients must face after undergoing surgery for BDIs [10]. Cholecystectomy-related injuries to the bile duct system are complicated and must be diagnosed and treated quickly for the best possible outcome. Concomitant vascular injuries, especially to the branches of the right hepatic artery, may obscure the visibility of BDIs. Common bile duct strictures (also known as longitudinal strictures) have been linked to unsuccessful BDI repair [11,12]. The majority of BDIs are diagnosed either during surgery or soon thereafter [13]. The most common complications are bile leakage and bile duct blockage. When BDIs are detected later in the postoperative period, patients are commonly sent from a secondary hospital to a tertiary care facility for final therapy, which might cause delays or improper therapies. It is easier to make educated decisions and improves the likelihood of successful treatment when a patient's BDI is clearly identified and described. When treatment is delayed, the long-term prognosis is heavily influenced by the reconstructive method selected and when it is performed.

It has been established that iatrogenic biliary injuries fare better when treated in a multidisciplinary setting in a dedicated hepatobiliary facility [13].

Choice of surgical reconstruction and timing of surgical repair are critical for a long-term course; thus, it is important to have access to specialists in radiology and endoscopy who are able to assist in the repair of small diameter bile ducts high inside the porta-hepatis [14]. The many interventional and surgical therapy options available now need close collaboration between gastroenterologists, radiologists, and surgeons [15].

In this context, we analyzed the multidisciplinary strategy used to the therapy of iatrogenic bile duct injuries after cholecystectomy with a focus on the long-term success of the patient.

MATERIAL AND METHODS

This retrospective study was conducted at General Surgery Department of different hospitals of Khyber Pukhtunkhwa i.e Bacha Khan Medical Complex, Swabi, Peshawar Institute of Medical Sciences, Peshawar and Naseer Teaching Hospital, Peshawar for duration of two years from February 2020 to January 2022.The study comprised of 105 patients. Age, sex, place of

residence, and body mass index were among the specific demographics of the enrolled cases that were noted after receiving informed written consent. Excluded patients were aged <18 years and those who did not provide any written consent. Iatrogenic bile duct injuries in all the cases were caused during laparoscopic cholecystectomy performed using four-trocar approach.

The preoperative record of patients, findings at intervention (endoscopic or surgical) and complications during postoperative period in the hospital were noted down. Strasberg's categorization was used to categorize bile duct damage. Statistics were collected on the types of treatment given, the results obtained, and the necessity for further treatment.

All the data was analyzed by SPSS 22.0. Mean±SD was obtained for age and body mass index. Frequency and percentages were recorded in tabulation form.

RESULTS

Among 105 presented cases, there were 68 (64.8%) females and 37 (35.2%) males. The mean age of the patients was 55.2±6.30 years and had mean BMI 23.8±4.19 kg/m^2. 55 (52.4%) patients were from urban areas. Most common symptom was epigastric pain followed by fever, chills and jaundice. (Table 1)

Table-1: Included patients with detailed demographics

Variables	Frequency	Percentage
Gender		
Male	68	64.8
Female	37	35.2
Mean age (years)	55.2±6.30	
Mean BMI(kg/m^2)	23.8±4.19	
Residence		
Urban	55	52.4
Rural	50	47.6
Symptoms		
epigastric pain	40	38.1
fever	30	28.6
chills	25	23.8
jaundice	10	9.5

We found that Strasberg A was the most common injury found in 56 (53.3%) cases, followed by Strasberg D in 17 (16.2%) cases and Strasberg C in 12 (11.4%) cases. (Table 2)

Table-2: Type of injuries with Strasberg classification

Variables	Frequency	Percentage
Strasberg Classification		
A	56	53.3
B	5	4.8
C	12	11.4
D	17	16.2
E_1	5	4.8
E_2	7	6.7
E_3	2	1.9
E_4	1	0.95
Total	105	100

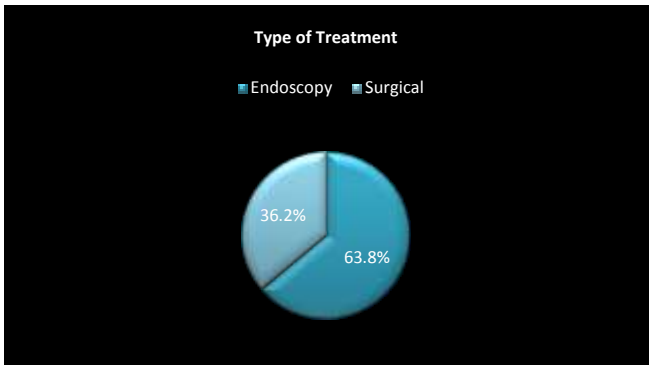

Figure-1: Treatment given to included patients

In all 105 cases, majority of the patients received endoscopy in 67 (63.8%) cases and surgical treatment in 38 (36.2%) cases.(fig 1)

Complications were bile leakage from the incision site, abdominal pain and bile leakage from the drain. (Table-3)

Table-3: Association of post-operative complications

Complications	Frequency	Percentage
Bile leakage		
Incision site	43	40.9
Drain	22	20.9
Abdominal Pain	6	5.7

We found that the majority of the patients recovered i.e 86 (81.9%) and only 19 (18.1%) cases received treatment again. 4 patients died (3.8%). (Table 4)

Table-4: Mortality and frequency of efficacy among all cases

Outcomes	Frequency	Percentage
Effectiveness	86	81.9
Treatment again	19	18.1
Mortality		
Yes	4	3.8
No	101	96.2

DISCUSSION

The treatment of iatrogenic bile duct damage is particularly difficult [16]. Too many common bile ducts are still severed during cholecystectomy, Simon wrote [17]. Even though laparoscopic cholecystectomy has been around for decades, a disproportionate number of patients still have injuries to their common bile ducts. Clearly, it is a positive development that the rate of bile duct damage following cholecystectomy has dropped to a more promising 0.2% [18].

When bile duct injuries are not properly treated, serious problems arise, including biliary peritonitis, which can cause sepsis and multiple organ failure in the acute phase, and biliary cirrhosis, which can lead to liver failure and the need for a liver transplant in the long term [19].

In the current study 105 patients with ages 18-68 years had iatrogenic bile duct injuries were presented. Among 130 presented cases, majority were females 68 (64.8%) and 37 (35.2%) males. The mean age of the patients was 55.2±6.30 years and mean BMI 23.8±4.19 kg/m^2. A study conducted by Ibrarullah M et al also presented same findings that females were higher in numbers than males,[20] 55 (52.4%) patients were from urban areas. Most common symptom was epigastric pain, followed by fever, chills and jaundice. Çavuşoğlu SD et al described that epigastric pain was the common symptom among those patients suffering from iatrogenic bile duct injuries.[21] 15-35% of bile duct injuries are caused by local causes. Our study's prevalence of local risk factors (30.5%) was consistent with the percentages of local risk factors reported in the literature. Previous research concluded same results to our findings. [22]

We used the Strasberg classification to categorize bile duct injuries because it is a thorough classification that takes into account biliary leakage along with other injuries. A comprehensive approach to diagnosis and treatment is essential when dealing with iatrogenic bile duct damage. [23, 24] The most common form of treatment among the 105 cases was endoscopy (67/63.8%), followed by surgery (38.1/36.2%). Injuries to the bile duct can now nearly always be treated endoscopically with a sphincterotomy and a nasobiliary catheter or stent, avoiding the need for invasive surgery. [25] For substantial bile duct injuries, endoscopic therapy has a high success rate (66–100%), especially for injuries of types A and D, where the injured area is not very large. [23]

The previous study found that while 96 patients opted for bilioenteric anastomosis, a total of 136 patients required elective surgery due to the failure of other minimally invasive techniques (endoscopy and interventional radiology) [26]. Surgical procedures such as common bile duct repair over a T-tube splint,

choledocholithotomy, strictureplasty and T-tube splint, and biliolithotomy [27]. In our study, complications were bile leakage from the incision site, abdominal pain and bile leakage from the drain. We found that the majority of the patients recovered 86 (81.9%) and only 19 (18.1%) cases received treatment again. Frequency of dead patients was 4 (3.8%). In a prior research, 84% of patients with bile duct injuries who were monitored and treated at a facility with an experienced hepatobiliary surgeon, an endoscopist and a radiologist with complete vision of the biliary tree survived the surgical procedure. [28] Another study found a greater success rate (92.3%) than what was previously reported in the literature while treating 26 injuries using clinic-based surgeries. [29] It's possible that this is due to the fact that postoperative patients weren't followed up with for very long. Although biliary stenosis can occur months or even years following surgical therapy, it is impossible to estimate the rate of biliary stenosis in individual patients.

CONCLUSION

We concluded in this study that the iatrogenic bile duct injuries were effectively treated with endoscopy and surgical treatment by using Strasberg classification. There was higher effectiveness and mortality rate was low.

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