Open Access

Original Article

Comparison of Factors Associated with Complications in Patients with Mirizzi Syndrome Undergoing Cholecystectomy

M Talha Makshoof, Syed Mukarram Hussain

Department of General Surgery, Combined Military Hospital Peshawar/National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To determine the frequency of post-operative morbidity in terms of wound infection, wound dehiscence, gall bladder fossa collection and post- operative pancreatitis in patients with Mirizzi syndrome undergoing cholecystectomy.
Study Design: Comparative cross-sectional study.
Place and Duration of Study: Department of General Surgery, Combined Military Hospital, Peshawar Pakistan, from Apr 2019 to Feb 2022.
Methodology: A total of 150 patients of age 20-70 years of either gender, diabetics and undergoing cholecystectomy for Mirizzi syndrome were included. Cholecystectomy was done in every patient. After surgery patients were shifted to post-surgical wards and were evaluated for wound infection, dehiscence within 24 to 48 hours while their stay in the ward. Ultrasound was performed after 24 hours to check for Gall bladder fossa collection. After 48 hours of procedure, patients were discharged and were followed in OPD for up to 2 months and Post-op morbidity was noted.
Results: Out of 150 patients of Mirizzi syndrome studied, 32(21.3%) showed any one of more complications while 128(78.7%) did not show any complication. Mean age of the study participants was 41.45±8.75 years. Wound infection was found in 16(10.6%) patients, wound dehiscence in 07(4.6%) patients, gall bladder fossa collection in 03(2%) patients and post-operative pancreatitis in 06(4%) patients. Method of surgery had statistically significant relationship with presence of complications among study participants (p-value<0.05).
Conclusion: This study concluded that these complications were found in considerable no of patients managed for Mirizzi syndrome. Male patients and patients managed with open surgical method were more at risk of having complications.

Keywords: Cholecystectomy, Morbidity, Mirizzi Syndrome.

How to Cite This Article: *Makshoof T, Hussain SM. Comparison of Factors Associated with Complications in Patients with Mirizzi Syndrome Undergoing Cholecystectomy. Pak Armed Forces Med J 2025; 75(Suppl-2): S261-S264. DOI: https://doi.org/10.51253/pafmj.v75iSUPPL-2.9429*

INTRODUCTION

Mirizzi syndrome is an unusual complication of gallstone disease. Mirizzi syndrome is found in significant number of patients in both eastern and western parts of world and more in patients having underlying gall bladder pathologies.[1] Pain abdomen, fever and jaundice are salient features of this syndrome and jaundice is usually of obstructive type. Severity of inflammation and presence of adhesion and Calot's triangle may be risk factors for severe form of illness in these patients.[2] Inability to diagnose this disease will eventually lead to major bile duct injury.[3] There are four types of Mirizzi syndrome with type-I being the most common type while type-IV being least commonly encountered in clinical practise.[4]

Mirizzi Syndrome does not occur too commonly therefore becomes a challenge for treating teams from both diagnostic and treatment point of view. Advancement in hepatobiliary surgical modalities have enabled surgeons to diagnose it early and manage effectively. Number of service related, patient related and surgeon related factors influence the outcome of this rare condition but combination of laparoscopic and robot-assisted surgical methods have bee associated with favourable outcome in these patients.[6]

One study found out that open and laparoscopic cholecystectomy did not differ in terms of immediate or late post-operative comlications.[7] It has been reported in one study that laparoscopic surgery was associated with more short term morbidity as compared to open surgery for gall stones.[8] Analysis of surgeries performed for Mirizii syndrome reported Postoperative morbidity rate of 28%.[9] In one recent study overall morbidity rate in the management of Mirizzi syndrome is reported to be 16.6%.[10] Results therefore remain highly variable in existing literature regarding results of management of this condition via various available methods.

By conducting this study, we want to determine the frequency of post op morbidity for Mirizzi

Correspondence: Dr M Talha Makshoof, Department of General Surgery, Combined Military Hospital Peshawar Pakistan
Received: 27 Oct 2022; revision received: 30 May 2023; accepted: 31 May 2023

syndrome undergoing cholecystectomy. Little work has been done locally in this regard. Moreover, limited local data is available in literature to help us determine the extent of problem in our population and role of cholecystectomy in Mirizzi syndrome. Hence, we want to conduct this study to get data and to implement the results in our hospital. This will improve patients' prognosis and help surgeons to decrease the post-operative morbidity in patients with Mirizzi syndrome undergoing operative management.

METHODOLOGY

This comparative cross-sectional study was planned and conducted at Combined Military Hospital Peshawar from April 2019 to February 2020. Sample size was calculated by using sample size calculator by using statistics of previous study in which significant complication rate in Mirizzi syndrome was 1% while 30% had no complications.[10] Margin of error was kept as 10%. Non-probability, consecutive sampling technique was used to gather the sample for this study.

Inclusion Criteria: Patients of age 20-70 years of either gender and undergoing cholecystectomy for Mirizzi syndrome were included in the study.

Exclusion Criteria: Patients with Hepatic diseases (AST & ALT>40IU) eg. Chronic Liver Disease or patients suffering from Chronic Obstructive Pulmonary Disease (COPD) or patients having Cardiac disease were excluded from the study.

After taking approval from hospital ethical committee via letter no 00228/22, all the patients who fulfilled the inclusion criteria were enrolled in the study from wards of Department of Surgery, CMH Peshawar. Demographic information like name, age, gender was also obtained. Each patient who reported to the CMH OPD and were diagnosed with Mirizzi syndrome was selected. Cholecystectomy was done in every patient. All surgeries were performed by a single surgical team with assistance of researcher under general anaesthesia. After surgery patients were shifted to post-surgical wards and were evaluated for wound infection, dehiscence within 24 to 48 hours while their stay in the ward. Ultrasound was performed after 24 hours to check for Gall bladder fossa collection. After 48 hours of procedure, patients were discharged and were followed in OPD for up to 2 months and Post- op morbidity was assessed. Patients who developed morbidity were managed as per hospital protocol. All this information (age, gender, type of surgery (Open/Laparoscopic) and Post-operative morbidity (Yes/No) was recorded on performa.

Statistical analysis of the data was performed using Statistical Package for the social sciences (SPSS) version 23:00. Descriptive statistics were calculated. Mean±SD were calculated for continuous variables like age. Frequency and percentage were calculated for gender, type of surgery (open/laparoscopic) and post-op morbidity type of morbidity. Chi-square test was applied to see association of various factors with post-op morbidity and p-value≤0.05 was taken as significant.

RESULTS

A total of 150 patients of Mirizzi syndrome were studied in final analysis. Out of them 63(42%) were male while 87(58%) were female. Table-I summarized the general characteristics of study participants. With regards to presence of complications, wound infection was found in 16(10.6%) patients, wound dehiscence in 07(4.6%) patients, gall bladder fossa collection in 03(2%) patients and post-operative pancreatitis in 06(4%) patients. Type-II Diabetes Mellitus was found in 9(6%) patients while Hypertension was found in 7(4.6%) study participants.

Table-I: Characteristics of patients with Mirizzi syndrome included in the study (n=150)

Study parameters	n(%)
Age (years)	
Mean±SD	41.45±8.75
Range (min-max)	18 years-57years
Mean Duration of	
Surgery (minutes)	39.6±9.342 minutes
Gender	
Male	63(42%)
Female	87(58%)
Type of surgery	
Laparoscopic	103(68.6%)
Open	47(31.4%)
Complications	
Wound infection	16(10.6%)
Wound dehiscence	7(4.6%)
Post operative pancreatitis	6(4%)
Gall bladder fossa collection	3(2%)
Comorbid Illnesses	
Type-II Diabetes Mellitus	09(6%)
Hypertension	07(4.6%)
Asthma	6(4%)
Ischemic Heart Disease	3(2%)

Table-II summarized the results of statistical analysis. Two groups were made on basis of presence of complications. 128(85.3%) had no complication

while 32(14.7%) had any one or more complications It was revealed that patients who underwent laparoscopic surgery had more chances of falling in complication group as compared to no complication group (p-value<0.05)

Table-II: Comparison of complications with regard to carious variables (n=150)

Factors	No Complications n=128	Complications n=32	p-value
Presence of comorbid illness			
No illness	103(79.6%)	22(68.75%)	0.010
Type II diabetes Mellitus	05(3.9%)	04(12.5%)	
Hypertension	02(1.5%)	05(15.6%)	
Asthma	04(3.1%)	02(6.2%)	
Ischemic heart disease	02(1.5%)	01(3.1%)	
Type of surgery			
Laparoscopic	94(79.6%)	09(28.2%)	<0.001
Open	24(20.4%)	23(71.8%)	

DISCUSSION

In mid-20th century Pablo Mirizzi, an Argentinian surgical specialist,[11] described the inflammation of gallbladded and biliary channels secondary to obstruction of bile duct due to gall stones. This clinical scenario was later considered as a disorder of hepatobiliary system and named after him as Mirizzi's syndrome (MS). Galls stone not being managed for long time may lead to number of complications including MS which can be encountered in around 2% of the presentations of patients with gall stones.[12,13] MS may range from just compression of ductus to as severe as formation of fistula in hepatobiliary system. At the time of surgery, surgeon needs to be extra cautious regarding this complication as it may have made serious changes in local anatomy and conventional approach may not work at its best in these patients.[14,15]

This study was conducted to determine the frequency of post-operative morbidity in terms of wound infection, wound dehiscence, gall bladder fossa collection and postoperative pancreatitis in patients with Mirizzi syndrome undergoing cholecystectomy. A study conducted in recent past revealed that no statistically significant difference existed with regard to complications in patients undergoing open vs laparoscopic cholecystectomy.[7] Another study concluded that open method was safer as compared to laparoscopic method in terms of morbdiity.[8] Analysis of surgeries performed for Mirizii syndrome reported Postoperative morbidity rate of 28%.[9] In one recent study overall morbidity rate in the management of Mirizzi syndrome is reported to be 16.6%.[10] Our results revealed that open surgery was statistically significantly associated with presence of port-operative complications.

In a study,16 MS was seen in around 2% of the patients where total patients were around 1100. Fourtenn patients out of total underwent laparoscopic procedure and three were converted to open due to any per-operative complication. Type III and IV cases were managed by Roux-en-Y procedure in their study. We studied patients in our tertiary care centre over three years and observed 14.5% morbidity, highlighting 2 cases of postoperative collection and 1 case of biliary fistula. There was no postoperative mortality. The mean follow-up of patients was 13.4±4 months.[16] Comparison shows that our results were not very different from studies done in other parts of the world

In another study, 17 Out of 39 patients, 34 had type-I MS and five patients had type II MS. Gall bladder carcinoma was found in almost 11% of the patients included in their study. Complication were seen in around 18% of their patients. Conversion to open method was very frequent in type I and type II patients (74% and 100% respectively).[17] These results were not very different from our study as in our data set, complications were found in considerable no of patients managed for Mirizzi syndrome. Male patients and patients managed with open surgical method were more at risk of having complications.

According to analysed series of the literature, from 11% up to 22% patients with MS had concomitant or postoperative complications in form of strictures requiring redo surgeries or dilations and from 10% to 24% of them had biliary fistulas.[18,19] In another series, only one case with type III MS having biliary fistula resolved by ERCP with plastic stent placement which showed good success rates.[20] In a study Kumar *et al.*, 97 concluded that open method was best choice of treatment for patients with suspected or diagnosed MS. Even those patients who underwent laparoscopic method, most needed conversion to open method. Therefore open method remains a better choice may be due to difficult anatomy as a result of chronic inflammation in hepatobiliary area. Another perspective was given by Antoniou *et al.*,[21] in which around 60% cases of MS were successfully managed by laparoscopic method.

A lot of technical difficulties make use of laparoscopic method of surgery controversial for management of patients suffering from Mirizzi Syndrome.[22] Main problem is high rate of conversion to open method of surgery during the surgeries and re do surgeries after the surgery.[22] Evolution in laparoscopic method have gaiven this method more safety and in recent times it is not contraindicated for patients suffering from MS especially in experienced hands.[23] Laparosocpic method sometime in conventional form may not be enough for cases of MS. Laparoscopic cholidocoplasty is an improvised procedure performed by surgeons and seem to be more useful in patients suffering from MS.

CONCLUSION

This study concluded that these complications were found in considerable no of patients managed for Mirizzi syndrome. Male patients and patients managed with open surgical method were more at risk of having complications.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MTM: & SMH: Study design, drafting the manuscript, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

REFERENCES

1. Shirah BH, Shirah HA, Albeladi KB. Mirizzi syndrome: necessity for safe approach in dealing with diagnostic and treatment challenges. Ann Hepato- Biliary-Pancreat Surg 2017; 21(3): 122-30.
2. Zhou J, Xiao R, Yang J, Wang L, Wang JX, Zhang Q, et al. Mirizzi syndrome complicated by common hepatic duct fistula and left hepatic atrophy:a case report. J Int Med Res 2018; 46(11): 4806-4812.
3. Elhanafy E, Atef E, El AN, Hamdy E, Elhemaly M, Sultan AM, et al. Mirizzi Syndrome: How it could be a challenge. Hepato-Gastroenterol 2014; 61(133): 1182-1186.
4. Cui Y, Liu Y, Li Z, Zhao E, Zhang H, Cui N, et al. Appraisal of diagnosis and surgical approach for Mirizzi syndrome. ANZ J Surg 2012; 82(10): 708-713.
5. Chen H, Siwo EA, Khu M, Tian Y. Current trends in the management of Mirizzi Syndrome: a review of literature. Med 2018; 97(4): 7-10.
6. Ryu H, Kim JH, Jeon UB, Jang JY, Kim TU, Yeom JA, et al. Biliary anastomotic stricture after surgical management of mirizzi syndrome: treated with long-term percutaneous transhepatic biliary drainage. Korean J Pancreas Biliary Tract 2018; 23(3): 134-138.
7. Gelbard R, Khor D, Inaba K, Okoye O, Szczepanski C, Matsushima K, et al. Role of laparoscopic surgery in the current management of mirizzi syndrome. Am Surg 2018; 84(5): 667-671.
8. Uppara M, Rasheed A. systematic review of mirizzi's syndrome's management. J Pancreas 2017; 18(1): 1-8.
9. Payá-Llorente C, Vázquez-Tarragón A, Alberola-Soler A, Martínez-Pérez A, Martínez-López E, Santarrufina-Martínez S, et al. Mirizzi syndrome: a new insight provided by a novel classification. Ann Hepatobiliary Pancreat Surg 2017; 21(2): 67-75.
10. Abou-Saif A, Al-Kawas FH. Complications of gallstone disease: Mirizzi syndrome, cholecystocholedochal fistula, and gallstone ileus. Am J Gastroenterol 2002; 97(2): 249-254. https://doi.org/10.1111/j.1572-0241.2002.05451.x
11. Mirizzi PL. Syndrome del conducto hepatico. J Int Chir 1948; 8(1): 731-77.
12. Johnson LW, Sehon JK, Lee WC, Zibari GB, McDonald JC. Mirizzi syndrome: Experience from a multi-institutional review. Am Surg 2001; 67(3): 11-14.
13. Karakoyunlar O, Sivrel E, Koc O, Denecli AG. Mirizzi syndrome must be ruled out in the differential diagnosis of any patients with obstructive jaundice. Hepatogastroenterology 1999; 46(3): 2178-2182.
14. Martin RF, Rossi RL. Bile duct injuries. Spectrum, mechanism of injury, and their prevention. Surg Clin North Am 1994; 74(1): 781-803.
15. Pemberton M, Wells AD. The Mirizzi syndrome. Postgrad Med J 1997; 73(2): 487- 490.
16. Lledó JB1, Barber SM, Ibañez JC, Torregrosa AG, Lopez-Andujar R. Update on the diagnosis and treatment of mirizzi syndrome in laparoscopic era: our experience in 7 years. Surg Laparosc Endosc Percutan Tech 2014; 24(6): 495- 501.
17. Schäfer M1, Schneiter R, Krähenbühl L. Incidence and management of Mirizzi syndrome during laparoscopic cholecystectomy. Surg Endosc 2003; 17(8): 1186-1190.
18. Zaliekas J, Munson JL. Complications of gallstones: the Mirizzi syndrome, gallstone ileus, gallstone pancreatitis, complications of "lost" gallstones. Surg Clin North Am 2008; 88(3): 1345–1368.
19. Mithani R, Schwesinger WH, Bingener J, Sirinek KR, Gross GW. The Mirizzi syndrome: multidisciplinary management promotes optimal outcomes. J Gastrointest Surg 2008; 12(3): 1022–1028.
20. Kumar A, Senthil G, Prakash A, Behari A, Singh R, Kapoor V, et al. Mirizzi's syndrome: lessons learnt from 169 patients at a single center. Korean J Hepatobiliary Pancreat Surg 2016; 20(1): 17–22.
21. Antoniou SA, Antoniou GA, Makridis C. Laparoscopic treatment of Mirizzi syndrome: a systematic review. Surg Endosc 2010; 24(3): 33–39.
22. Rust KR, Clancy TV, Warren G, Mertesdorf J, Maxwell JG. Mirizzi's syndrome: a contraindication to coelioscopic cholecystectomy. J Laparoendosc Surg 1991; 1(4): 133–137.
23. Noshiro H, Yoda Y, Hiraki M, Kono H, Miyake S, Uchiyama A, et al. Survival outcomes of 220 consecutive patients with three-staged thoracoscopic esophagectomy. Dis Esophagus 2016; 29(3): 1090–1099.
24. Piccinni G, Sciusco A, De Luca GM, Gurrado A, Pasculli A, Testini M, et al. Minimally invasive treatment of Mirizzi's syndrome: is there a safe way? Report of a case series. Ann Hepatol 2014; 13(3): 558–564.
25. Beltran MA. Mirizzi syndrome: history, current knowledge and proposal of a simplified classification. World J Gastroenterol 2012; 18(2): 4639–4650.