Original Article

Benign Biliary Stricture - Outcome Analysis at Tertiary Care Hospital Quetta

Benign Biliary Stricture

Allauddin[1], Abdul Kareem Zarkoon[3], Azmatulah[2], Gulalai Rehman[3] and Nadia Niaz[3]

ABSTRACT

Objective: To understand the varied presentation and outcome of patients with Benign Biliary Strictures.
Study Design: Observational / analytical study
Place and Duration of Study: This study was conducted at the Bolan university of Medical and Health Sciences between January 2007 and July 2019.
Materials and Methods: Data was collected through review of patients charts. Malignant biliary stricture and age <15 years were excluded. The patients were divided into Endoscopic and surgery groups. Variables included demographic, etiology, type of stricture.
Results: Results of surgical (Hepaticojejunostomy) and endoscopic stenting in term of hospital stay, morbidity, mortality were evaluated. Thirty-five patients were treated. 22 female and 13 male. Age ranged between 21--80 years. There were 19 patient in surgical group and 16 patients in the endoscopic group. The stricture were type1, (13) type11, (16). And type 111, (6). The outcome was good in 27 patients. 8 patients developed cholangitis. Cholangitis was more in the endoscopic group.
Conclusion: The morbidity was higher in endoscopic group 37.5%. The overall excellent result was 77%. Stricture recurrence was 5.7%.The endoscopic procedure hadmore complications as compared to the surgical management.
Key Words: Benign biliary stricture. Bismuth classification, cholangitis, hepatico-jejunostomy

Citation of article: Benign Biliary Stricture - Outcome Analysis at Tertiary Care Hospital Quetta. Med Forum 2021;32(4):15-19.

INTRODUCTION

Benign bile duct stricture {BBS} are uncommon and challenging clinical conditions that requires a coordinated multidisciplinary approach[1] by involving Gastroenterology, Radiology, and surgery.
The benign biliary strictures occurs following injury to bile duct during surgery[2] or idiopathic, when the most likely cause is an infection. The injury leads to inflammation around the injured duct leading to fibrosis and stenosis leading to stricture[3].
Bismuth classification for BBS.
Type 1,low common hepatic duct stricture, hepatic duct stump> 2cm.
Type 2, Mid common hepatic duct stricture, hepatic duct stump< 2cm
Type 3, Hillar stricture with no residual common hepatic duct, hiler confluence is intact
Type 4, Destruction of hilar stricture confluence right and left ducts separated.
Type 5, Involvement of aberrant right sectoral duct or including common hepatic duct.[4]
Bile duct stricture may be asymptomatic but, can cause life threatening complications, such as ascending cholangitis[5]. Long term survival is possible with proper management of benign biliary strictures. A good prognosis is seen in those cases diagnosed early[6]. Work up includes history, clinical examination, laboratory and radiological investigation. Ultra sound shows intra or extra hepatic duct dilatation[7]. ERCP is both diagnostic and therapeutic. MRCP and transhepatic cholangiography also has role in the management of benign biliary stricture.[8] Modalities for the management of BBS are endoscopic and surgical. The excellent results with endoscopic management is 80 -88%, with a morbidity of 36-40%. The endoscopic treatment need frequent changing of the stent.[9]
Draganov et al, reviewed 29 patients retrospectively, the etiology for BBS was 66%post-surgery, 31% chronic pancreatitis, and 3% idiopathic. The endoscopic therapy was successful in 18 (62%). Recurrence of stricture occur in 11 (38%) patients, Type 1 and type 2 stricture had the highest success rate(80%).[10]
Surgery has excellent results 90- 95 % in relieving obstruction with less-complications 18-26 % and long term outcome is good compare to endoscopy.
Lille Moe KD et al. reviewed 142 patients with benign biliary strictures, underwent surgical treatment, with follow up of 57.7 months. The excellent or good results in 91% , Stricture recurrence in 11 patients (7.9%).[11] In a case series Pitt et al found a higher success rate in

[1.] Department of Surgery / Anatomy[2], Bolan Medical College, Quetta.
[3.] Balochistan Institute of Nephro-Urology, Quetta.

Correspondence: Allauddin, Senior Registrar, Surgery Department, Bolan Medical College, Quetta.
Contact No: 03003805361
Email: drallauddin5@gmail.com

Received: October, 2020
Accepted: December, 2020
Printed: April, 2021

surgical 88 % vs endoscopic 55 % and concluded that the hepatojejunostomy is the best procedure for benign biliary stricture management.[6]

The purpose of this study was to review the patients with benign biliary strictures in Balochistan, in this era of laparoscopic surgery. Where laparoscopic surgery is still in the premature stage. There is great need to understand the clinical presentation and management of benign condition with its life threatening complications.

MATERIALS AND METHODS

Inclusion criteria: Patients diagnosed as benign biliary stricture presented at Bolan medical complex hospital Quetta, between January 2007 to July 2019, were divided into.

Group 1: Endoscopic group

Group 11: surgery group

Exclusion criteria:

1, malignant biliary stricture

2, Age< 15 years

3, Any benign condition other than biliary stricture requiring hepatico-jejunotomy.

Data was collected reviewing the charts from hospital record.

Variables were.

1, Age

2, Gender

3, Tlkaline phosphatase, serum bilirubin,

4, type of stricture,

5, Mode of treatment surgical or endoscopic

6, Follow up

Sub group analysis were performed to see the effect of the various variables on the outcome parameters,

(a) Hospital stay

(b) Morbidity

(c) Mortality.

(d) Follow up

Mortality was defined death occurring within 30 days of hospital stay.

Analysis plan: Descriptive analysis includes frequencies and proportion of demographic variables such as age sex of the patient. Measure of central tendency such as mean and standard deviation were calculated for continuous variables. Chi square test was applied for categorical variables and t- test for continuous variables at 5 % significance level (alpha =0.05).the data was entered and stored in Espino version 6.04.(a word processing data base and statistical program public health, CDC,WHO).and would be converted to SPSS version 11.0.(statistical package for social sciences**).**

RESULTS

Thirty five patients with BBS were treated during the study period, patient were divided in to Endoscopic group and surgical group.

Demographic and clinical characteristic of patients are listed in table 1

Table No.1: Demographic and clinical characteristic of patients

Characteristics	Endoscopy	Surgery	P value
age Mean +_ SD ,Y	49.3+_17.2	46.0+_ 14	.34
Sex ,F/M	9/7	13/6	.36
Symptoms Jaundice Pain Fever	 12 11 7	 17 15 10	 38 .54 .65
Labs mean +_ SD Albumin.g/l Bilirubin mg/dl Alkaline phos.u/l	 2.87+_.756 4.3+_2.8 372+_53	 3.1+_1.25 7.5+_5.2 520+_74	 .60 .12 .26
Bismuth classififcation Type 1 Type 2 Type 3	 12 4 0	 1 12 6	 .31
Hospital stay mean +_SD	5.4+_2	9.5+_2	<.05
Lenghth of follow up, mean +_SD month	9+_5.2	26+_8.6	.025
Complication no of patients 1.Cholangitis 2.Wound infection 3.pneumonia	6 5 0 1	4 1 3 0	.08

There were 22 female and 12 male patients. All patients underwent Ultrasonographic scan of abdomen. ERCP done in 31 (89%) patients. MRCP was done in 4 patients. Post traumatic strictures were 60%, and 40% had post inflammatory strictures.

Endoscopic treatment was successful in 16 patients. 13 patient received one 10F to 12F stents, 3 received two stents. In endoscopic group the cause of benign biliary strictures was traumatic in 10 patients and inflammatory in 6 patients. Majority of the patients had Bismuth type1, stricture12 patients. None of the patient treated endoscopically had type111 or typeIV strictures. The morbidity in Endoscopic group was 37.5%, sixdeveloped cholangitis, four required multiple exchange of stent, and one underwent hepaticojejunostomy. Cholangitis and clogging was the major cause of stent exchange. Over all stent exchange was needed in 10 instances. One mortality 6.25% occurs due to sepsis secondary to stent clogging.

Surgery group: Hepaticojejunostomy with Roux-en-Y was done in 14 patients (73%),5 patient's underwent, Choledocho-jejunostomy in 2,Choledochoduo-denostomy 1, Primary end-end anastomosis in 1, and in 1 patient whippl's procedure with Roux-en-Y hepaticojejunostomy was performed. The strictures weretype1. (1), type11. (12),and type111. (6).Morbidity was (21%) 3 wound infections, and 1 patient had cholangitis. Mortality was 5.7%. Restenosis occurred in 1 patient 5.7% at the 32 month follow up.

Outcome: Endoscopic group MEAN +_SD follow up time was 9 +_ 5.2 months and 26+_ 8.6 months in the Surgery group. Hospital stay was higher for surgical group (9.5 days vs 5.4 days: $p<0.05$). Morbidity was high in endoscopic than surgery group (6 vs 4). Hospital mortality was 5.7 %, 1 patient died in each group. In endoscopic group 4 patients developed recurrent stricture (25%) requiring resenting and 1 patient underwent hepaticojejunostomy. While in surgery group, 1 patient developed a late restenosis after 32 months, requiring revision hepaticojejunostomy.

Surgery achieved excellent or good result in 16 patients (84%), and fair or poor results in 3 patients (16%). Endoscopic biliary stinting was successful (excellent or good) in 12 patients (75%) and fair or poor results in 4 patients (25%). Overall excellent or good results were achieved in 27 patients (77%) and fair or poor results in 8 patients (23%).

No statistically differences was found between treatment groups, except for the length of hospital stay and serum bilirubin level, which achieved a borderline significance. However univariate analysis showed significance of the albumin and serum bilirubin on the outcome.

DISCUSSION

The benign biliary stricturesrepresent a significant clinical problem.The treatment goal for these patients is long-term absence of symptoms.[14]

Various studies[15] have reported bilio-enteric anastomosisa good modality for the treatment of benign biliary strictures.[6] However outcome of repair of benign biliary stricture is difficult to evaluatebecause reports in the literature don't discern morbidity and mortality directly associated with the primary or secondary stricture repair.[16]

Although excellent or good results with surgery is 90-95%, with a morbidity of 18-26%[4]. Advances in endoscopic technology have increased non-operative options[18]. The endoscopy has an excellent or good results up to 80%,with morbidity 36-40%[19]. It is difficult to compare endoscopic and surgical treatment, because of the variable criteria in selecting the patients[20]. Surgical modality is considered the definitive treatment for benign biliary strictures[21]. There are, reports of endoscopic treatment result comparable with surgery, with lower morbidity and mortality[22]. Nevertheless, stricture dilatation and stent insertion is still regarded as a second line or bridging therapy to surgery ,The limitations of nonsurgical management are (1) the need for multiple procedures (2) Morbidity by stent dysfunction[10]. Endoscopic therapy is difficult to compare with surgical due to lack of both randomized trial and agreement on definition for successful outcome.[18] In the absence of randomized control trial, Case series with careful patient selection, strict definition of successful outcome, and long follow up provide the most accurate information on success rate.

Tocchi A, studied 42 patients with BBS (6), with follow up longer than 60 months. 20patients were treated with endoscopic stenting and 22 with surgery. Morbidity was more in endoscopic than surgical group (9 vs 2; P = .34). Surgery achieved excellent or good long-term outcome in 17 of 22 patients. Endoscopic stenting was successful in 16 of 20 patients.

In our study 35 patients with BBS, Nineteen (19) patients underwent surgical treatment (bilo-enteric anastomosis), and 16 were treated with endoscopy. In surgical group excellent or good results were achieved in 16 patients (84%). Endoscopic group12 patients achieved excellent or good results (75%)Endoscopic group had more complications, 6 had cholangitis, and 1 patient developed restenosis. Surgical group had 3 wound infections and 1cholangitis.

In a retrospective study[23] the surgeryhad success rate of 88% as compared to Endoscopic which achieved 55 % success rate[5].Draganov et al[10] Reviewed retrospectively 29 patients, Endoscopic was successful in 18 (62%). Therapy failed in 11 (38%) patients. Out 11 patients, 4 underwent Roux-en-Y hepaticojejunostomy, 5 underwent restenting.

The endoscopic stenting is greatly useful not only as a bridgetherapy, Butalso as definitive treatment in patients with associated medical disease. However endoscopic stenting has many disadvantages.[26]

BBS secondary to inflammatory condition like, chronic pancreatitis, is difficult to managed endoscopically[24],

Hepatojejunostomy has good results in the literature, Tocchi et al[15], 84 patients with post traumatic bile strictures, 42 underwent, Hepatico-jejunostomythe mortality was 2.2% and morbidity 21%.The commonest complications were wound infection. Excellent or good result was achieved in 83% and fair or poor results in 17%.[6]

In our series out of 19 surgery group patients, 14 underwent hepaticojejunostomy (73%). excellent or good results was 79% and fair or poor results was 16%.

We achieved a follow up (mean 2 years), maximum 8 years in surgical group, in endoscopic group a mean follow up (9 months) and maximum 7 years. The patients leveltype1 and type 11 strictures had the best prognosis with hepaticojejunostomy. The type 111 and type 1V has comparatively poor results.

Farizio et al[27] The basic principle forbiliary-enteric anastomosis are (1) expose the healthy portion of bile duct (2) perform muco-mucosal anastomosis (2) avoid tension (3) performed water tight anastomosis with single layer of interrupted stiches.[30]

In conclusion optimal management of patients with bile ducts injuries and strictures in the current era remains surgical reconstruction. First step is ERCP to define the stricture stenting to relieve obstruction, followed bysurgical reconstruction with Roux-en-Y hepaticojejunostomy associated with success rate of more 90%.

We feel at present time on the basis of our results and those in the literature, the surgical option is the best for management of benign biliary strictures. However it still need to be confirmed by randomized controlled trials.

CONCLUSION

The study shows better results with surgery group, as compared to endoscopic group. The endoscopic group has a high recurrent rate and morbidity need for multiple procedures.

Author's Contribution:

Concept & Design of Study:	Allauddin
Drafting:	Abdul Kareem Zarkoon, Azmatulah
Data Analysis:	Gulalai Rehman, Nadia Niaz
Revisiting Critically:	Allauddin, Abdul Kareem Zarkoon
Final Approval of version:	Allauddin

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. McDonald ML, Farnell MB, Nagorney DM. Benign biliary strictures: repair and outcome with a contemporary approach. Surgery 1995;118(4):582–591.
2. Nijssen MAJ, Schreinemakers JMJ, Meyer Z, Van Der Schelling GP, Crolla R, Rijken AM. Complications after laparoscopic cholecystectomy: a video evaluation study of whether the critical view of safety was reached. World J Surg 2015;39(7):1798–1803.
3. Halbert C, Pagkratis S, Yang J, et al. Beyond the learning curve: incidence of bile duct injuries following laparoscopic cholecystectomy normalize to open in the modern era. Surg Endosc. 2016;30(6):2239–2243.
4. Bismuth H, Franco D, Corlette MB, Hepp J. Long term results of Roux-en-Y hepaticojejunostomy. Surg Gynecol Obstet. 1978;146(2):161–167.
5. Cameron JL, Cameron AM. Current surgical therapy E-book. Elsevier Health Sciences; 2013.
6. Tocchi A, Mazzoni G, Liotta G, Costa G,et al. Management of benign biliary strictures: biliary enteric anastomosis vs endoscopic stenting. Arch Surg 2000;135(2):153–157.
7. Victor DW, Sherman S, Karakan T. Current endoscopic approach to indeterminate biliary strictures. World J Gastroenterol WJG 2012;18(43):6197.
8. Singh A, Gelrud A, Agarwal B. Biliary strictures: diagnostic considerations and approach. Gastroenterol Rep 2015;3(1):22–31.
9. Baron TH, DaVee T. Endoscopic management of benign bile duct strictures. Gastrointest Endosc Clin 2013;23(2):295–311.
10. Draganov P, Hoffman B, Marsh W. Long-term outcome in patients with benign biliary strictures treated endoscopically with multiple stents. Gastrointest Endosc 2002;55(6):680–686.
11. Lillemoe KD, Melton GB, Cameron JL, et al. Postoperative bile duct strictures: management and outcome in the 1990s. Ann Surg 2000;232(3):430.
12. Pitt HA, Kaufman SL, Coleman J. Benign postoperative biliary strictures. Operate or dilate? Ann Surg 1989;210(4):417.
13. Zyromski NJ, Butler JR. Management of Postoperative Bile Duct Stricture. Difficult Decisions in Hepatobiliary and Pancreatic Surgery. Springer;2016.p.241–252.
14. Chapman WC, Halevy A, Blumgart LH,. Postcholecystectomy bile duct strictures: management and outcome in 130 patients. Arch Surg 1995;130(6):597–604.
15. Tocchi A, Costa G, Lepre L. The long-term outcome of hepaticojejunostomy in the treatment of benign bile duct strictures. Ann Surg 1996;224(2):162.
16. Ahmed FF, Kareem TS, Abdulla KS, Karim QH. Iatrogenic Bile Duct Injury Following Cholecystectomy, Surgical Management and Outcome: A Single Center Experience. J Kurd Board Med Spec 2018;4(1).
17. Northover JMA, Terblanche J. A new look at the arterial supply of the bile duct in man and its surgical implications. Br J Surg 1979;66(6):379–384.
18. Quintero GA, Patiño JF. Surgical management of benign strictures of the biliary tract. World J Surg 2001;25(10):1245–1250.
19. Vitale GC, George M, McIntyre K. Endoscopic management of benign and malignant biliary strictures. Am J Surg 1996;171(6):553–557.
20. Davids PHP, Rauws EAJ, Coene P. Endoscopic stenting for post-operative biliary strictures. Gastrointest Endosc 1992;38(1):12–18.

21. Sicklick JK, Camp MS, Lillemoe KD, et al. Surgical management of bile duct injuries sustained during laparoscopic cholecystectomy: perioperative results in 200 patients. Ann Surg 2005;241(5):786.
22. Costamagna G, Pandolfi M. Long-term results of endoscopic management of postoperative bile duct strictures with increasing numbers of stents. Gastrointest Endosc 2001;54(2):162–168.
23. Davids PH, Tanka AK, Rauws, et al. Benign biliary strictures. Surgery or endoscopy? Ann Surg 1993;217(3):237.
24. Shimada H, Endo I, Shimada K, The current diagnosis and treatment of benign biliary stricture. Surg Today 2012;42(12):1143–1153.
25. Griffin N, Wastle ML, Dunn WK. Magnetic resonance cholangiopancreatography versus endoscopic retrograde cholangiopancreatography in the diagnosis of choledocholithiasis. Eur J Gastroenterol Hepatol 2003;15(7):809–813.
26. Moon JH, Choi HJ, Koo HC, et al. Feasibility of placing a modified fully covered self-expandable metal stent above the papilla to minimize stent-induced bile duct injury in patients with refractory benign biliary strictures (with videos). Gastrointest Endosc 2012;75(5):1080–1085.
27. Smits ME, Rauws EAJ, Van Gulik. Long-term results of endoscopic stenting and surgical drainage for biliary stricture due to chronic pancreatitis. Br J Surg 1996;83(6):764–768.
28. Saxena P, Diehl DL, Kumbhari V, et al. A US multicenter study of safety and efficacy of fully covered self-expandable metallic stents in benign extrahepatic biliary strictures. Dig Dis Sci 2015;60(11):3442–3448.
29. Costamagna G, Familiari P. Multidisciplinary approach to benign biliary strictures. Curr Treat Options Gastroenterol 2007;10(2):90–101.
30. Nuzzo G, Giuliante F, Giovannini I, Murazio M et al. Advantages of multidisciplinary management of bile duct injuries occurring during cholecystectomy. Am J Surg 2008;195(6): 763–769.
31. Park J-S, Lee SS, Song TJ, et al. Long-term outcomes of covered self-expandable metal stents for treating benign biliary strictures. Endoscopy 2016;48(05):440–447.
32. Bismuth H, Majno PE. Biliary strictures: classification based on the principles of surgical treatment. World J Surg 2001;25(10):1241–1244.