SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Medicine

Management of Malignant Biliary Strictures: Experience from an Endoscopic Unit

Y. Essadni[1*], M. Acharki[1], M. Salihoun[1], I. Serraj[1], N. Kabbaj[1]

[1]EFD-HGE Unit, Ibn Sina Hospital, Mohamed V University, Rabat, Morocco

DOI: 10.36347/sasjm.2024.v10i08.002 | **Received:** 29.05.2024 | **Accepted:** 03.07.2024 | **Published:** 01.08.2024

***Corresponding author:** Y. Essadni
EFD-HGE Unit, Ibn Sina Hospital, Mohamed V University, Rabat, Morocco

Abstract **Original Research Article**

***Introduction*:** Malignant biliary strictures have been increasingly prevalent in recent years. These tumors are often managed palliatively, with biliary drainage being the primary therapeutic approach. Endoscopic retrograde cholangiopancreatography (ERCP) with stenting remains the gold standard technique for biliary drainage. The aim of this study is to evaluate the success and failure rates of different biliary drainage techniques and assess the success rate of biliary stent placement. ***Materials and Methods*:** This is a descriptive study conducted from March 2015 to January 2023, including all patients with tumor-related biliary strictures who underwent palliative biliary drainage. ***Results*:** 388 patients were included. The average age was 61.2 years, with a male predominance of 61.8%. 98.9% of patients presented with cholestatic jaundice. The average levels of Total Bilirubin and C-reactive protein (CRP) were 220.11 mg/l and 62.59 mg/l, respectively. The location of the obstruction was: distal common bile duct in 54.8%, proximal common bile duct in 24.1%, confluence in 18%, intrahepatic bile ducts in 2%, and middle common bile duct in 1.3% of cases. Sphincterotomy was performed in 40.3% of cases, and precut in 33.7% of cases. The overall success rate was 90.9%. 24.1% of cases underwent a repermeabilization technique: balloon dilation in 6.9% of cases, intratumoral drilling in 5.4%, with success rates of 66% and 95%, respectively. A biliary stent was placed in 86.8% of patients. In case of ERCP failure, biliary-enteric anastomosis under endoscopic ultrasound guidance was performed in 6.6% of patients, and transhepatic drainage in 1.6% of patients. Short-term complications were noted in 10.4% of cases. Clinical and biochemical evolution at 1 month after ERCP was favorable in 86% of cases. ***Conclusion*:** Palliative drainage of malignant biliary strictures primarily relies on ERCP as the first-line approach, demonstrating satisfactory success and complication rates.

Keywords: Malignant biliary strictures, biliary drainage, endoscopic retrograde cholangiopancreatography (ERCP).

INTRODUCTION

Malignant biliary strictures result from endobiliary tumors (cholangiocarcinomas) and extrinsic compressions (pancreatic cancer, lymphadenopathy, metastases...). Their incidence has been increasing in recent years. The technical advancements in various diagnostic means, including endoscopic, radiological, and anatomopathological techniques, particularly the combination of these methods, allow for a highly sensitive etiological diagnosis.

Due to late diagnosis and rapid progression, most of these tumors are subject to palliative management from the outset, across all age groups. Biliary drainage through endoscopic means currently constitutes the gold standard palliative treatment for patients at high surgical risk or those with contraindications for resection due to metastases or locoregional extension. The goal of palliative drainage is to alleviate jaundice, improve quality of life, and enable adjunctive treatments such as chemotherapy. Palliative drainage has seen significant progress with the technical development of interventional imaging, endoscopy, and palliative surgery, resulting in symptom regression and enhanced quality of life for patients.

The aim of this study is to assess the success and failure rates of various biliary drainage techniques and to evaluate the success rate of biliary stent placement.

MATERIALS AND METHODS

This is a retrospective descriptive study conducted from March 2015 to January 2023. Were included all patients referred for endoscopic biliary drainage due to malignant biliary stricture, whose overall

condition or disease extension did not allow for upfront curative surgical intervention.

Patients with benign biliary strictures and those with advanced deterioration in general condition (WHO: 4) or a life expectancy less than 1 month were excluded. All endoscopic retrograde cholangiopancreatography (ERCP) procedures were performed under general anesthesia.

Duodenoscopes were used for the endoscopic procedures. Cannulation of the main bile duct was achieved using standard sphincterotomes or infundibulotomes in case of catheterization failure. The drainage stents used were either uncovered or covered, and they could be plastic or metal, depending on the specific case.

All information collected for this study originated from the patients' medical records.

RESULTS

A total of 388 patients were included in the study. The average age of the patients was 61.2 years, with a range from 25 to 90 years. There was a male predominance, with 61.8% being men.

Clinically, 98.9% of patients presented with cholestatic jaundice, with pruritus observed in 70.8% of cases. Abdominal pain was reported in 77% of patients. Before drainage, 30% of patients had symptoms of acute cholangitis.

In the series, the overall condition of all patients was assessed using the WHO score: 4.6% had a WHO score of 1, 59.2% had a WHO score of 2, and 36.2% had a WHO score of 3.

Biologically, the average total bilirubin level was 220.11 mg/l, and the average CRP level was 62.59 mg/l. The mean value of CEA was 145 ng/l, ranging from 1 ng/l to 4059 ng/l, with a normal value being less than 5 ng/l. The mean value of CA 19-9 was 3091.94 IU/ml, ranging from 2 IU/ml to 106279 IU/ml, with a normal value being less than 37 IU/ml.

The location of the obstruction was specified by biliary MRI and retrograde cholangiography. It was at the distal common bile duct in 54.8% of cases, the proximal common bile duct in 24.1%, the confluence in 18%, intrahepatic bile ducts in 2%, and the middle common bile duct in 1.3% of cases.

Malignant biliary strictures had various etiologies. Tumors of the head of the pancreas accounted for 59% of cases, cholangiocarcinoma (distal or at the confluence) for 20%, compressive metastases for 7%, degenerated Vaterian ampulloma for 4%, and lymphomas in 1%.

Regarding pancreatic tumors, they were locally advanced in 54.6% of cases, metastatic in 28.4%, and non-operable localized in 16.9% of cases.

Therapeutically, the approach to the main bile duct was as follows: sphincterotomy in 40.3% of cases and precut in 33.7% of cases. The success rate was 90.9%. In 24.1% of cases, a repermeabilization technique was applied: balloon dilation in 6.9% of cases, intratumoral drilling in 5.4%, with success rates of 66% and 95%, respectively.

A biliary stent was placed in 86.8% of patients: metallic stents in 76.3%, plastic stents in 10.5%, with insertion success rates of 98% and 100%, respectively. Concerning metallic stents, they were covered in 37.5% of cases, uncovered in 40% of cases, and semi-covered in 8.3% of cases.

In case of ERCP failure, biliary-enteric anastomosis under endoscopic ultrasound guidance was performed in 6.6% of patients, and transhepatic drainage in 1.6% of patients. The technical success rate of these two procedures was 100%.

A short-term complication was noted in 10.4% of cases: cholangitis in 3.4% of cases, acute pancreatitis in 1.3%, bleeding in 1.3%, biloma in 2%, and sepsis in 2% of cases. Clinical and biochemical evolution at 1 month after ERCP was favorable in 86% of cases.

DISCUSSION

The diagnosis of biliary stricture is often made following the onset of jaundice or cholangitis. While the cause of the stricture may be apparent based on the context and imaging findings, it can sometimes be challenging to identify, requiring numerous diagnostic techniques.

The average age of onset for malignant biliary strictures ranges between 58.1 and 73.9 years [1-3]. In this series, the average age was 61.2 years, aligning with literature data.

The main causes of malignant biliary stricture include pancreatic adenocarcinoma, cholangiocarcinoma (intrahepatic, perihilar, or distal), ampullary tumors, and compressive metastatic invasion of the liver or lymph nodes. Pancreatic cancer represents the most frequent cause of biliary strictures, followed by cholangiocarcinomas [6].

In cases of tumor-induced biliary stricture, clinical examination typically reveals continuous, progressively increasing obstructive jaundice, associated with dark urine, pale stools, pruritus, and signs of scratching. All of these symptoms are often accompanied by a decline in general health [2, 7].

Surgery remains the only curative treatment for patients with biliary-pancreatic cancer. However, these tumors are often diagnosed at an advanced stage, rendering them inoperable. Palliative treatment becomes the primary therapeutic option, with the relief of biliary obstruction becoming a top priority [8]. Tumoral invasion causing jaundice may lead to debilitating pruritus, asthenia, anorexia, and an impaired quality of life. Normalization of bilirubin levels is also necessary to initiate chemotherapy if required.

The most common method for biliary drainage is endoscopic retrograde cholangiopancreatography (ERCP) and the placement of an endoprosthesis (plastic or metal) [9, 10]. In comparing types of stents, plastic stents pose a risk of bacterial biofilm formation, increasing the likelihood of cholangitis and stent obstruction [11, 12]. Metal stents have a significantly larger diameter and a higher patency rate than plastic stents [11, 13, 14]. Covered metal stents are designed to prevent tumor ingrowth through the stent interstices and are removable, preventing embedding. A meta-analysis comparing covered metal stents to uncovered metal stents concluded that the group with covered metal stents had a lower incidence of adverse events, with no significant difference in dysfunction [17].

In the study by Moss, metal stents were preferred, with 88% of patients receiving them compared to 12% with plastic stents. The success rate of biliary stent insertion is generally satisfactory, ranging between 90% and 100% according to various studies, and is better for plastic stents than for metal stents, which was also the case in our study [18].

According to the European Society of Gastrointestinal Endoscopy, based on randomized controlled trials involving 638 patients, early complications develop in 5% of patients after attempted biliary stenting and are not related to the type of stents [19].

Early complications include cholangitis, pancreatitis, bleeding, perforation, and early stent migration [20]. Post-ERCP cholangitis is a severe complication that involves the patient's life prognosis in 8% to 20% of cases, being the most frequent complication in our study [21]. Post-ERCP acute pancreatitis is generally moderate but rarely fatal, with an incidence reported at almost 3% and a mortality rate of one case. This rate was lower in our series [22]. Hemorrhage is typically associated with sphincterotomy, and hemostatic disorders are often implicated. Hemorrhagic complications can be either immediate or delayed, sometimes up to 2 weeks after the procedure [23, 24].

Late complications are generally related to stent dysfunction, which can involve stent migration, occurring in almost 5% of cases for plastic stents and partially covered metal stents, 1% for uncovered metal stents, and 20% for fully covered metal stents [22]. Stent occlusion may be caused by biliary sludge for plastic and metal stents, usually occurring within three to six months, or by tumor growth in the case of uncovered metal stents [25].

The placement of a stent through a malignant obstruction of the main bile duct via endoscopy has a success rate of 90-96%, according to the French Society of Digestive Endoscopy, and around 94.2% in the study by Dhir et al [2, 25]. Failures and limitations of the technique are mainly represented by surgical history (gastrectomy), and tumoral duodenal invasion, making access to the papilla impossible. In our study, the success rate was 90.9%, with the causes of failure primarily attributed to an impassable digestive stricture.

Regarding other drainage methods, such as anastomosis under endoscopic ultrasound guidance (EUS) and transhepatic radiological drainage, the technical success rates vary between 70 and 100% in different studies. This success rate may be explained by these techniques being less common and performed only in expert centers [26, 27].

CONCLUSION

Malignant biliary strictures have been on the rise in recent years, causing discomfort related to jaundice, pruritus, pain, and a decline in the quality of life for affected patients. The rapid progression of these tumors puts the patient's life at risk, limiting the indication for curative surgical treatment. Palliative treatment plays a crucial role in improving symptoms and enhancing the quality of life, thanks to advances in therapeutic methods.

Both endoscopic and radiological palliative treatments have shown highly satisfactory results. The choice between different drainage techniques should be discussed based on the operator's expertise and the availability of equipment and supplies. Our study demonstrated a very satisfactory success rate and a low complication rate for endoscopic retrograde cholangiopancreatography (ERCP). Additionally, combining multiple techniques for papillary access has contributed to enhancing these results.

Radiological and endoscopic ultrasound approaches have more limited indications, despite an acceptable success rate, and remain options in cases of ERCP failure or as part of a complementary strategy.

REFERENCE

1. Bain, V. G., Abraham, N., Jhangri, G. S., Alexander, T. W., Henning, R. C., Hoskinson, M. E., ... & Sadowski, D. C. (2000). Prospective study of biliary strictures to determine the predictors of malignancy. *Canadian Journal of Gastroenterology and*

Hepatology, *14*(5), 397-402. DOI:10.1155/2000/467567.
2. Ka, I., Faye, M., Diop, P. S., ABNAC, F., Ndoye, J. M., & Fall, B. (2018). Clinical, epidemiological and therapeutic features of biliary tract cancers: About 20 cases. *The Pan African Medical Journal*, *29*, 13-13.
3. Dhir, V., Itoi, T., Khashab, M. A., Park, D. H., Teoh, A. Y. B., Attam, R., ... & Maydeo, A. (2015). Multicenter comparative evaluation of endoscopic placement of expandable metal stents for malignant distal common bile duct obstruction by ERCP or EUS-guided approach. *Gastrointestinal endoscopy*, *81*(4), 913-923.
4. Faik, M., Halhal, A., & Oudanane, M. (1998). Cancer de la tête du pancréas au stade d'ictère. *Med Maghreb*, *72*, 7-9.
5. Kruse, E. J. (2010). Palliation in Pancreatic Cancer. *Surgical Clinics of North America*, *90*(2), 355–364. DOI: 10.1016/j.suc.2009.12.004.
6. Gentilhomme, L. (2015). Efficacité et morbidité du drainage biliaire endoscopique en cas de sténose tumorale de la voie biliaire principale chez les sujets de 75 ans et plus en situation palliative. *Médecine humaine et pathologie*.
7. Padillo, F. J., Andicoberry, B., Pera-Madrazo, C., & Sitges-Serra, A. (2002). Anorexia and malnutrition in patients with obstructive jaundice. *Nutrition*, *18*(11-12), 987-990.
8. Dumonceau, J. M., Tringali, A., Blero, D., Devière, J., Laugiers, R., Heresbach, D., & Costamagna, G. (2012). Biliary stenting: indications, choice of stents and results: European Society of Gastrointestinal Endoscopy (ESGE) clinical guideline. *Endoscopy*, *44*(03), 277-298.
9. GARGOURI, D., KOCHLEF, A., OUEKAA, A., ELLOUMI, H., KILANI, A., & ROMANI, M. (2010). Obstruction des endoprothèses biliaires. *Tunisie médicale*, *88*(7), 462-466.
10. Cipolletta, L., Rotondano, G., Marmo, R., Bianco, M. A., & Italian Evidence-Based Gastroenterology & Hepatology Club. (2007). Endoscopic palliation of malignant obstructive jaundice: an evidence-based review. *Digestive and liver disease*, *39*(4), 375-388.
11. Vaishnavi, C., Samanta, J., & Kochhar, R. (2018). Characterization of biofilms in biliary stents and potential factors involved in occlusion. *World journal of gastroenterology*, *24*(1), 112-123.
12. Lam, R., & Muniraj, T. (2021). Fully covered metal biliary stents: A review of the literature. *World Journal of Gastroenterology*, *27*(38), 6357-6373. doi: 10.3748/wjg.v27.i38.6357. PMID: 34720527; PMCID: PMC8517778.
13. Huibregtse, K., Cheng, J., Coene, P. P. L. O., Fockens, P., & Tytgat, G. N. J. (1989). Endoscopic placement of expandable metal stents for biliary strictures-a preliminary report on experience with 33 patients. *Endoscopy*, *21*(06), 280-282.
14. Neuhaus, H., Hagenmüller, F., & Classen, M. (1989). Self-expanding biliary stents: preliminary clinical experience. *Endoscopy*, *21*(05), 225-228.
15. Mullen, J. T., Lee, J. H., Gomez, H. F., Ross, W. A., Fukami, N., Wolff, R. A., ... & Evans, D. B. (2005). Pancreaticoduodenectomy after placement of endobiliary metal stents. *Journal of gastrointestinal surgery*, *9*, 1094-1105.
16. Valle, J., Wasan, H., Palmer, D. H., Cunningham, D., Anthoney, A., Maraveyas, A., ... & Bridgewater, J. (2010). Cisplatin plus gemcitabine versus gemcitabine for biliary tract cancer. *New England Journal of Medicine*, *362*(14), 1273-1281.
17. Almadi, M. A., Barkun, A. N., & Martel, M. (2013). No Benefit of Covered vs Uncovered Self-Expandable Metal Stents in Patients With Malignant Distal Biliary Obstruction: A Meta-analysis. Clinical Gastroenterology and Hepatology, *11*(1), 27–37.e1. doi: 10.1016/j.cgh.2012.10.019
18. Moss, A. C., Morris, E., Leyden, J., & MacMathuna, P. (2007). Do the benefits of metal stents justify the costs? A systematic review and meta-analysis of trials comparing endoscopic stents for malignant biliary obstruction. *European journal of gastroenterology & hepatology*, *19*(12), 1119-1124. doi: 10.1097/MEG.0b013e3282f16206. PMID: 17998839.
19. Dumonceau, J. M., Tringali, A., Papanikolaou, I. S. (2018). Endoscopic biliary stenting: indications, choice of stents, and results: European Society of Gastrointestinal Endoscopy (ESGE) clinical guideline - updated October 2017. *Endoscopy*, *50*, 910–930.
20. Talukdar, R. (2016). Complications of ERCP. *Best Pract Res Clin Gastroenterol*, *30*, 793-805.
21. Motte, S., Deviere, J., Dumonceau, J. M., Serruys, E., Thys, J. P., & Cremer, M. (1991). Risk factors for septicemia following endoscopic biliary stenting. *Gastroenterology*, *101*(5), 1374-1381.
22. Dumonceau, J. M., Tringali, A., Blero, D., Devière, J., Laugiers, R., Heresbach, D., & Costamagna, G. (2012). Biliary stenting: indications, choice of stents and results: European Society of Gastrointestinal Endoscopy (ESGE) clinical guideline. *Endoscopy*, *44*(03), 277-298. doi :10.1055/s-0031-1291633.
23. Boustière, C., Veitch, A. M., & Vanbiervliet, G. (2011). Endoscopy and antiplatelet agents. ESGE Guideline. *Endoscopy*, *43*, 445–61.
24. Anderson, M. A., Fisher, L., Jain, R., Evans, J. A., Appalaneni, V., Ben-Menachem, T., ... & Dominitz, J. A. (2012). Complications of ERCP. *Gastrointestinal endoscopy*, *75*(3), 467-473.
25. Recommandations de la SFED. (2009). Consensus en endoscopie digestive. *Les prothèses biliaires Acta Endosc*, *39*, 116-121. DOI 10.1007/s 1019009000061.
26. Artifon, E. L., Aparicio, D., Paione, J. B., Lo, S. K., Bordini, A., Rabello, C., ... & Gupta, K. (2012). Biliary drainage in patients with unresectable, malignant obstruction where ERCP fails:

endoscopic ultrasonography-guided choledochoduodenostomy versus percutaneous drainage. *Journal of clinical gastroenterology*, *46*(9), 768-774.

27. Khashab, M. A., Valeshabad, A. K., Afghani, E., Singh, V. K., Kumbhari, V., Messallam, A., ... & Kalloo, A. N. (2015). A comparative evaluation of EUS-guided biliary drainage and percutaneous drainage in patients with distal malignant biliary obstruction and failed ERCP. *Digestive diseases and sciences*, *60*, 557-565.