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WJGS mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal surgery and covering a wide range of topics including biliary tract surgical procedures, biliopancreatic diversion, colectomy, esophagectomy, esophagostomy, pancreas transplantation, and pancreatectomy, *etc*.

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EDITORIAL

Advances in minimally invasive treatment of malignant obstructive jaundice

Li-Min Kang, Lei Xu, Fa-Kun Yu, Fu-Wei Zhang, Li Lang

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Abstract

Malignant obstructive jaundice (MOJ) encompasses a range of diseases stemming from malignant tumors such as cholangiocarcinoma, pancreatic cancer, and primary liver cancer, among others, which cause obstruction in both intra- and extra-hepatic bile ducts. This obstruction may lead to elevated bilirubin levels, hepatic function impairment, and a low rate of successful surgical resection in clinical settings. There are various minimally invasive treatment options for MOJ, including endoscopic biliary drainage, ultrasound-guided procedures, and percutaneous biliary tract puncture drainage.

Key Words: Malignant obstructive jaundice; Endoscopic retrograde cholangiopancreatography; Ultrasound endoscopy; Percutaneous transhepatic cholangial drainage; Radiofrequency ablation

Core Tip: Malignant obstructive jaundice (MOJ) presents with a subtle onset and poses challenges in early detection. By the time jaundice becomes apparent, the disease has typically advanced to a stage where surgical intervention is no longer feasible. Minimally invasive procedures for jaundice reduction are often the only viable option for the patients, as radical surgery is not feasible. In clinical practice, attention should be paid to the factors such as the underlying cause of MOJ, the degree of bile duct obstruction, the severity of jaundice, the patient's overall health status and expected prognosis, and the surgical expertise available at the respective medical facility.

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INTRODUCTION

Malignant obstructive jaundice (MOJ) typically occurs when bile ducts are invaded or compressed by advancing tumors in the hepatic hilar region and nearby areas, leading to impaired bile drainage and accumulation of bile both inside and outside the liver[1]. This results in symptoms such as yellowing of the skin and sclera, generalized itching, and hepatic dysfunction. Pancreatic cancer, primary hepatocellular carcinoma, and other malignant tumors can cause obstruction in both intra- and extra-hepatic bile ducts[2]. If the obstruction is not promptly relieved, worsening jaundice can manifest with symptoms such as loss of appetite and skin itching. Additionally, bilirubin itself is toxic and can cause systemic damage to multiple organ functions, potentially becoming life-threatening in severe cases[3]. Treatment options for MOJ include radical surgical interventions as the primary choice[4]. However, MOJ often presents insidiously, making early detection challenging. By the time jaundice becomes apparent, the disease has usually progressed to an advanced stage. Furthermore, jaundice can result in failure of organs such as the liver and kidneys, making some patients unsuitable for radical surgical procedures[5].

Minimally invasive jaundice reduction surgery is often the preferred option for most patients, as radical surgery is not feasible[6]. Methods of minimally invasive jaundice reduction surgery include endoscopic biliary drainage, endoscopic ultrasound-guided biliary drainage (EUS-BD) and percutaneous transhepatic cholangial drainage (PTCD). Additionally, there are combination treatments involving minimally invasive techniques, such as intracavitary radiofrequency ablation (RFA) and biliary stenting with particle radiotherapy[7]. MOJ is classified into high-level obstruction and low-level obstruction according to the region of obstruction[8]. Low-level obstruction refers to biliary obstruction located at the distal end of the confluence point of the cystic duct, and the combination of biliary stenting or nasobiliary drainage with endoscopic retrograde cholangiopancreatography (ERCP) has unique advantages in the treatment of low-level biliary obstruction. According to the Bismuth-Corlette typing[9], high-level biliary obstruction can be divided into 4 types: Type I, the obstruction is located in the common hepatic duct without involving the bifurcation; Type II, the obstruction involves the common hepatic duct; Type III, the obstruction involves the right and left hepatic ducts; and Type IV, the obstruction involves the bifurcation of the common hepatic duct and the right and left hepatic ducts simultaneously. PTCD and combined stenting with ^{125}I particle beam radiotherapy or intracavitary RFA are more appropriate for patients with types II, III and IV high-level biliary obstructions. This article briefly discusses recent advancements in minimally invasive jaundice reduction surgery, focusing on non-radical resection techniques.

ERCP GUIDED STENT PLACEMENT

Biliary stent placement or nasobiliary drainage, based on ERCP, is commonly utilized in clinical practice[10]. The ERCP procedure involves accessing the descending part of the duodenum using duodenoscopy, inserting a guide wire into the biliopancreatic duct, injecting contrast medium to visualize any lesions or obstructions in the bile duct and pancreatic duct, and then placing plastic and/or metal stents, nasobiliary ducts, or drainage tubes based on the diagnosis. This intervention aims to alleviate symptoms, improve quality of life, and extend survival[11]. ERCP is particularly effective in treating MOJ, especially when the lower part of the common bile duct is obstructed[12]. A comparison of ERCP and PTCD for the treatment of low-level MOJ has been conducted[13], and it was found that ERCP resulted in a lower rate of postoperative complications and shorter hospital stay, and was more cost-effective, suggesting that ERCP may be a better initial treatment option for MOJ. Moreover the minimally invasive methods allow direct observation of the duodenal papilla and enables further examination of the bile duct using specialized tools. ERCP is minimally invasive, reduces the risk of bile leakage, and minimizes disruptions to digestive and metabolic functions[14]. A recent meta-analysis[15] found that both PTCD and ERCP were effective in relieving biliary obstruction and improving liver function, but ERCP was more suitable for treating low-level biliary obstruction, while PTCD was more favorable for treating high-level biliary obstruction. Additionally, ERCP stenting offers the flexibility of double or multiple stenting in cases of complex obstructions, with easy stent replacement if blockage occurs[16].

EUS-BD

EUS-BD is a valuable alternative for patients with MOJ who are not suitable for ERCP procedures. Common methods include transduodenal choledochal puncture and transgastric left hepatic duct puncture biliary drainage[17]. Advances in ultrasound endoscopy technology, innovative stenting techniques, and refined EUS-BD procedures have led to the technical success rate exceeding 90% and a notable reduction in adverse events[18]. In a study[19], EUS-BD performed in 20 patients with MOJ after ERCP failure, was found to be successful in all patients and there were no surgical complications, such as biliary tract infections, suggesting that EUS-BD has a better effect on biliary decompression in MOJ, with a

high success rate and good safety. As EUS-BD procedures become more widespread and the puncture technique improves, recent studies have suggested that EUS-BD is an effective option for patients with MOJ after failed ERCP or in those who are unable to undergo ERCP[20,21]. A multicenter randomized controlled study[22] found that both procedures, ERCP and EUS-BD, may be options for initial biliary drainage of unresectable MOJ. EUS-BD has a higher technical success rate associated with shorter operative time compared to ERCP; thus, primary EUS-BD may be the preferred option when a difficult ERCP is anticipated.

PTCD

X-ray or ultrasound-guided PTCD involves puncturing the biliary tract percutaneously and inserting a drainage tube into the bile duct to facilitate bile drainage from the body[5]. This method is commonly used in the clinical treatment of malignant obstructions. PTCD is a minimally invasive technique with unique characteristics that can be combined with percutaneous transhepatic biliary stenting to improve jaundice reduction[23]. The advantages of PTCD are that it is less physically demanding, less painful for the patient, relatively easy and inexpensive, has a higher success rate, and is currently considered to be a remedial method after ERCP tube placement failure[24]. A systematic evaluation and meta-analysis[6] comparing the safety and efficacy of ERCP and PTCD in the treatment of MOJ found that both treatments were safe and effective for MOJ. However, PTCD had a higher technical success rate and a lower incidence of post-operative pancreatitis. However, drawbacks include hindered nutrient absorption due to external bile drainage, potential complications such as bleeding and infections, as well as the inconvenience of managing drainage tubes and bags[25]. These factors limit the widespread application of PTCD in clinical settings.

BILIARY STENT COMBINED WITH ^{125}I PARTICLE THERAPY

PTCD plays a crucial role in bile drainage in MOJ. However, it has limitations. The introduction of biliary stents placed *via* PTCD effectively addresses these issues, converting external drainage to internal drainage, mimicking physiological drainage. This transformation significantly enhances patients' quality of life. Particularly, when combined with radiation therapy such as ^{125}I, and the stent's role extends beyond bile drainage to include tumor intervention and treatment[26]. A study indicates[27] that the combination of stent and ^{125}I particle placement results in a high surgical success rate, reduces bilirubin levels, and extends patient survival. Another study selected 21 patients with MOJ for PTCD combined with ^{125}I particle local radiotherapy. The results showed that 3 of the 21 patients had complete remission and 12 had partial remission, with an overall effective rate of 71.43% and a local control rate of 85.71%. Thus, this treatment can effectively improve patient quality of life and prolong the survival period[28]. Adverse effects of this combination treatment include infection, biliary bleeding, acute pancreatitis or hyperamylasemia, and ^{125}I displacement. However, the incidence of these adverse effects is not significantly higher than that with metallic biliary stenting alone[29]. Despite this, further validation and support through large-scale, evidence-based medical studies across multiple centers are necessary for clinical application.

BILIARY STENT COMBINED WITH RFA

An important advancement in the minimally invasive treatment of MOJ is the utilization of RFA in combination with stent placement. This innovative approach involves using RFA to thermally denature and necrose malignant tumor tissues in extrahepatic bile ducts, thereby inhibiting tumor growth. This treatment method can be repeated multiple times and has shown promise in treating stent restenosis, leading to improved stent patency time and extended patient survival [30]. However, the disadvantage of this method is that it may cause bile leakage into the abdominal cavity and biliary stricture in a few cases[31]. In this editorial, we comment on the efficacy and safety of percutaneous transhepatic biliary RFA in patients with MOJ as reported by Xing *et al*[32]. The authors selected 17 patients with unresectable MOJ and performed RFA under PTCD. All patients successfully completed the procedure, which significantly reduced the incidence of postoperative pancreatitis and biliary tract infections compared with ERCP, and the jaundice subsided satisfactorily with effective prolongation of biliary patency time and improvement in patients' quality of life. Another retrospective analysis[33] was performed on 150 patients who underwent stenting combined with RFA and 127 patients who underwent stenting only. The median duration of stent patency in patients with stenting combined with RFA was 11.2 months, with a median survival time of 12.3 months, which was significantly different from that of patients with stenting alone. Furthermore, clinical research[34] has also confirmed that stenting combined with RFA significantly prolongs stent opening time and improves patients' overall survival compared with stenting alone, and that there was no increase in the success rate of the procedure or post-procedural complications such as abdominal pain, infection, and bleeding. Despite these promising findings, the limited availability of specialized consumables for biliary RFA has hindered widespread adoption of this technique in clinical practice[35]. In conclusion, the use of stents in conjunction with RFA technology is deemed safe and effective, particularly in cases of stent blockage where recanalization can be achieved through RFA. However, long-term efficacy and postoperative complications need to be observed.

CONCLUSION

In the clinic, according to the MOJ patient's primary disease, bile duct obstruction site, jaundice level, the patient's physical status and expected survival, and the operation level of the respective clinical treatment center, comprehensive consideration is necessary by a multidisciplinary team to develop a scientific and reasonable minimally invasive treatment plan for each patient. It is believed that with the development of endoscopic technology, stent technology, drug research and other medical technologies, greater progress will be made in the treatment of MOJ.

FOOTNOTES

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REFERENCES

1 **Liu JJ**, Sun YM, Xu Y, Mei HW, Guo W, Li ZL. Pathophysiological consequences and treatment strategy of obstructive jaundice. *World J Gastrointest Surg* 2023; **15**: 1262-1276 [PMID: 37555128 DOI: 10.4240/wjgs.v15.i7.1262]
2 **Li J**, Zhuo S, Chen B, Liu Y, Wu H. Clinical efficacy of laparoscopic modified loop cholecystojejunostomy for the treatment of malignant obstructive jaundice. *J Int Med Res* 2020; **48**: 300060519866285 [PMID: 31547725 DOI: 10.1177/0300060519866285]
3 **Lianyuan T**, Hongsheng X, Xuxiang Z, Liancai W, Dazhao L, Deyu L. An alternative palliative surgical method for advanced malignant obstructive jaundice: Laparoscopic bridge choledochoduodenostomy. *Front Surg* 2022; **9**: 1056093 [PMID: 36684379 DOI: 10.3389/fsurg.2022.1056093]
4 **Li ZM**, Jiao DC, Han XW, Lei QY, Zhou XL, Xu M. Preliminary application of brachytherapy with double-strand (125)I seeds and biliary drainage for malignant obstructive jaundice. *Surg Endosc* 2022; **36**: 4932-4938 [PMID: 34845555 DOI: 10.1007/s00464-021-08848-6]
5 **Sarkodie BD**, Botwe BO, Brakohiapa EKK. Percutaneous transhepatic biliary stent placement in the palliative management of malignant obstructive jaundice: initial experience in a tertiary center in Ghana. *Pan Afr Med J* 2020; **37**: 96 [PMID: 33425129 DOI: 10.11604/pamj.2020.37.96.20050]
6 **Bian C**, Fang Y, Xia J, Shi L, Huang H, Xiong Q, Wu R, Zeng Z. Is percutaneous drainage better than endoscopic drainage in the management of patients with malignant obstructive jaundice? A meta-analysis of RCTs. *Front Oncol* 2023; **13**: 1105728 [PMID: 36793615 DOI: 10.3389/fonc.2023.1105728]
7 **Yang H**, Qin Q, Tang Y, Zhu W. Correlation between functional drainage and survival in malignant biliary obstruction after percutaneous biliary drainage. *Heliyon* 2024; **10**: e24088 [PMID: 38293534 DOI: 10.1016/j.heliyon.2024.e24088]
8 **Balogun OS**, Atoyebi OA. Management of Malignant Obstructive Jaundice: Defining the Relevance of Various Palliative Surgical Options in Resource-Challenged Settings: A Review Article. *J West Afr Coll Surg* 2022; **12**: 111-119 [PMID: 36388748 DOI: 10.4103/jwas.jwas_22_22]
9 **Raksasataya A**, Ahooja A, Krangbunkrong V, Jareanrat A, Titapun A, Khuntikeo N. Palliative Care in Cholangiocarcinoma. *Recent Results Cancer Res* 2023; **219**: 245-267 [PMID: 37660336 DOI: 10.1007/978-3-031-35166-2_9]
10 **Rizzo A**, Ricci AD, Frega G, Palloni A, DE Lorenzo S, Abbati F, Mollica V, Tavolari S, DI Marco M, Brandi G. How to Choose Between Percutaneous Transhepatic and Endoscopic Biliary Drainage in Malignant Obstructive Jaundice: An Updated Systematic Review and Meta-analysis. *In Vivo* 2020; **34**: 1701-1714 [PMID: 32606139 DOI: 10.21873/invivo.11964]
11 **Zhu L**, Huang ZQ, Wang ZW, Yang XP, Hong JB, Yang ZZ, Yu ZP, Cao RL, He JL, Chen YX. A comparative study on the application of different endoscopic diagnostic methods in the differential diagnosis of benign and malignant bile duct strictures. *Front Med (Lausanne)* 2023; **10**: 1143978 [PMID: 37521338 DOI: 10.3389/fmed.2023.1143978]
12 **Moll CF**, de Moura DTH, Ribeiro IB, Proença IM, do Monte Junior ES, Sánchez-Luna SA, Merchán MFS, Intriago JMV, Bernardo WM, de Moura EGH. Endoscopic Biliary Darinage (EBD) versus Percutaneous Transhepatic Biliary Drainage (PTBD) for biliary drainage in patients with Perihilar Cholangiocarcinoma (PCCA): A systematic review and meta-analysis. *Clinics (Sao Paulo)* 2023; **78**: 100163 [PMID: 36681067 DOI: 10.1016/j.clinsp.2022.100163]
13 **Pang L**, Wu S, Kong J. Comparison of Efficacy and Safety between Endoscopic Retrograde Cholangiopancreatography and Percutaneous Transhepatic Cholangial Drainage for the Treatment of Malignant Obstructive Jaundice: A Systematic Review and Meta-Analysis. *Digestion*

2023; **104**: 85-96 [PMID: 36617409 DOI: 10.1159/000528020]
14 **Zhao R**, Gu L, Ke X, Deng X, Li D, Ma Z, Wang Q, Zheng H, Yang Y. Risk prediction of cholangitis after stent implantation based on machine learning. *Sci Rep* 2024; **14**: 13715 [PMID: 38877118 DOI: 10.1038/s41598-024-64734-w]
15 **Wang Y**, Zhao X, She Y, Kang Q, Chen X. The clinical efficacy and safety of different biliary drainage in malignant obstructive jaundice: a meta-analysis. *Front Oncol* 2024; **14**: 1370383 [PMID: 38655140 DOI: 10.3389/fonc.2024.1370383]
16 **Dhir V**, Shah R, Udawat P. Endoscopic Ultrasound-Guided Biliary Interventions. *Gastrointest Endosc Clin N Am* 2022; **32**: 507-525 [PMID: 35691694 DOI: 10.1016/j.giec.2022.02.003]
17 **Doyle JB**, Sethi A. Endoscopic Ultrasound-Guided Biliary Drainage. *J Clin Med* 2023; **12** [PMID: 37048819 DOI: 10.3390/jcm12072736]
18 **DA-Silva RRR**, Mafra LGA, Brunaldi VO, Almeida LF, Artifon ELA. Endoscopic ultrasound-guided biliary drainage: a literature review. *Rev Col Bras Cir* 2023; **50**: e20233414 [PMID: 36995833 DOI: 10.1590/0100-6991e-20233414-en]
19 **Tarrio I**, Moreira M, Araújo T, Lopes L. EUS-Guided Choledochoduodenostomy after Failed Endoscopic Retrograde Cholangiopancreatography in Distal Malignant Biliary Obstruction. *GE Port J Gastroenterol* 2023; **30**: 65-73 [PMID: 37818398 DOI: 10.1159/000528808]
20 **Dietrich CF**, Arcidiacono PG, Bhutani MS, Braden B, Burmester E, Fusaroli P, Hocke M, Ignee A, Jenssen C, Al-Lehibi A, Aljahdli E, Napoléon B, Rimbas M, Vanella G. Controversies in Endoscopic Ultrasound-Guided Biliary Drainage. *Cancers (Basel)* 2024; **16** [PMID: 38730570 DOI: 10.3390/cancers16091616]
21 **Mukai S**, Itoi T. Preoperative endoscopic ultrasound-guided biliary drainage for primary drainage in obstructive jaundice. *Expert Rev Gastroenterol Hepatol* 2023; **17**: 1197-1204 [PMID: 38124621 DOI: 10.1080/17474124.2023.2293813]
22 **Teoh AYB**, Napoleon B, Kunda R, Arcidiacono PG, Kongkam P, Larghi A, Van der Merwe S, Jacques J, Legros R, Thawee RE, Saxena P, Aerts M, Archibugi L, Chan SM, Fumex F, Kaffes AJ, Ma MTW, Messaoudi N, Rizzatti G, Ng KKC, Ng EKW, Chiu PWY. EUS-Guided Choledocho-duodenostomy Using Lumen Apposing Stent Versus ERCP With Covered Metallic Stents in Patients With Unresectable Malignant Distal Biliary Obstruction: A Multicenter Randomized Controlled Trial (DRA-MBO Trial). *Gastroenterology* 2023; **165**: 473-482.e2 [PMID: 37121331 DOI: 10.1053/j.gastro.2023.04.016]
23 **Khan R**, Hussain Z, Bari V, Fiaz AB. Safety of Percutaneous Transhepatic Biliary Stenting in Patients with Obstructive Jaundice. *J Coll Physicians Surg Pak* 2019; **29**: 24-28 [PMID: 30630564 DOI: 10.29271/jcpsp.2019.01.24]
24 **Riaz A**, Pinkard JP, Salem R, Lewandowski RJ. Percutaneous management of malignant biliary disease. *J Surg Oncol* 2019; **120**: 45-56 [PMID: 30977913 DOI: 10.1002/jso.25471]
25 **Hafezi-Nejad N**, Liddell RP. Percutaneous Biliary Interventions: Clinical Indications, Comparative Effectiveness, Technical Considerations, Complications, and Outcomes. *Gastrointest Endosc Clin N Am* 2022; **32**: 493-505 [PMID: 35691693 DOI: 10.1016/j.giec.2022.02.005]
26 **Xia LL**, Su T, Li Y, Mao JF, Zhang QH, Liu YY. Improving rehabilitation and quality of life after percutaneous transhepatic cholangiography drainage with a rapid rehabilitation model. *World J Clin Cases* 2021; **9**: 10530-10539 [PMID: 35004984 DOI: 10.12998/wjcc.v9.i34.10530]
27 **Sheng Y**, Fu X, Wang G, Mu M, Jiang W, Chen Z, Qi H, Gao F. Safety and efficacy of self-expandable metallic stent combined with (125)I brachytherapy for the treatment of malignant obstructive jaundice. *Cancer Imaging* 2023; **23**: 33 [PMID: 37016400 DOI: 10.1186/s40644-023-00551-0]
28 **Ji L**, Zhang W, Hao S, Wang Z, Ding T, Zhang G. Percutaneous transhepatic cholangial drainage combined with intra-tumoral iodine-125 seeds implantation and chemotherapy for locally progressive pancreatic head cancer with obstructive jaundice. *J Contemp Brachytherapy* 2022; **14**: 462-469 [PMID: 36478703 DOI: 10.5114/jcb.2022.121563]
29 **Xing D**, Song W, Gong S, Xu A, Zhai B. Analysis of the Bacterial Spectrum and Key Clinical Factors of Biliary Tract Infection in Patients with Malignant Obstructive Jaundice after PTCD. *Dis Markers* 2022; **2022**: 1026254 [PMID: 35942130 DOI: 10.1155/2022/1026254]
30 **Cui W**, Huang JZ, Wang Q, Shi F, Gou Q, Chen XM, Zhang J, Li JP, Xu R. Percutaneous endobiliary radiofrequency ablation and stent placement for unresectable malignant biliary obstruction: a propensity score matching retrospective study. *BMC Gastroenterol* 2024; **24**: 270 [PMID: 39160477 DOI: 10.1186/s12876-024-03357-x]
31 **Song S**, Jin H, Cheng Q, Gong S, Lv K, Lei T, Tian H, Li X, Lei C, Yang W, Yang K, Guo T. Local palliative therapies for unresectable malignant biliary obstruction: radiofrequency ablation combined with stent or biliary stent alone? An updated meta-analysis of nineteen trials. *Surg Endosc* 2022; **36**: 5559-5570 [PMID: 35296949 DOI: 10.1007/s00464-022-09181-2]
32 **Xing Y**, Liu ZR, Li YG, Zhang HY. Efficacy and safety of percutaneous transhepatic biliary radiofrequency ablation in patients with malignant obstructive jaundice. *World J Clin Cases* 2024; **12**: 2983-2988 [PMID: 38898847 DOI: 10.12998/wjcc.v12.i17.2983]
33 **Kong YL**, Zhang HY, Liu CL, He XJ, Zhao G, Wang C, Kong LH, Zhao J. Improving biliary stent patency for malignant obstructive jaundice using endobiliary radiofrequency ablation: experience in 150 patients. *Surg Endosc* 2022; **36**: 1789-1798 [PMID: 33788032 DOI: 10.1007/s00464-021-08457-3]
34 **Yu T**, Zhang W, Li C, Wang C, Gong G, Wang L, Li G, Chen Y, Wang X. Percutaneous intraductal radiofrequency ablation combined with biliary stent placement for treatment of malignant biliary obstruction. *Abdom Radiol (NY)* 2020; **45**: 3690-3697 [PMID: 32277241 DOI: 10.1007/s00261-020-02516-4]
35 **Inoue T**, Yoneda M. Endoscopic intraductal radiofrequency ablation for extrahepatic cholangiocarcinoma: An update (2023). *World J Gastrointest Endosc* 2023; **15**: 440-446 [PMID: 37397976 DOI: 10.4253/wjge.v15.i6.440]

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