

The Curative Effect of PTCD and PTGD in Obstructive Jaundice Patients

Mingwei Sui¹, Xiukun Li², Qingxin Li¹, Lei LIU^{1,a,*}

¹Department of Ultrasonic, First Hospital of Jilin University, Changchun 130021, Jilin, China

²Department of Ultrasonict, Jilin Provincial People's Hospital, Changchun 130021, Jilin, China

^aliulei0731@jlu.edu.cn

*Corresponding Author

Keywords: Ultrasound-guided percutaneous transhepatic cholangial drainage (PCD), Ultrasound-guided percutaneous transhepatic gallbladder drainage (PTGD), Obstructive jaundice

Abstract: Both ultrasound-guided percutaneous transhepatic cholecystosis (PTGD) and percutaneous transhepatic cholecystosis (PTCD) can reduce serum bilirubin level and improve liver function. However, is there a difference in effectiveness between the two treatments? There are no studies on this issue. We retrospectively analyzed 106 cases of obstructive jaundice treated in the First Hospital of Jilin University, of which 55 cases were treated with ultrasound-guided PTGD. 51 cases were treated with ultrasound-guided PTCD. Serum bilirubin and transaminase values were measured one day before operation and seventh day after operation, and the reduction rate of serum bilirubin level was calculated. The incidence of postoperative complications were compared, including infection, bleeding, and biliary leakage. Most patients see a decrease in serum bilirubin levels, but elevated in a few. The differences of serum bilirubin and transaminase decrease rate between PTGD group and PTCD group were not significant ($P>0.05$), the same was true for complications($P>0.05$).

1. Introduction

Obstructive jaundice is clinical common disease, it is to show bile outflow obstruction and appear reverse into blood, the malignant tumor of digestive system often brings about obstructive jaundice. Ultrasound-guided percutaneous transhepatatic cholecystotomy (PTGD) and Percutaneous transhepatatic chol cholecystotomy (PTCD) are commonly used in the treatment of patients with obstructive jaundice. When a patient was finally diagnosed with high obstruction, his doctor preferred PTCD because gallbladder drainage is not effective. PTCD and PTGD have good therapeutic effect on patients with low obstructive jaundice. Both treatments reduced jaundice and improved liver function, allowing the patient to proceed with subsequent treatment. For the operator, PTGD is easier to operate, for the patients, there are fewer complications. Since the two puncture treatments each has its own advantages, is there differences in the therapeutic effect? That is the purpose of this study.

2. Material and Methods

2.1 Material

A retrospective study of patients admitted to the First Hospital of Jilin University from July 2017 to July 2018 was conducted. The patients with jaundice and eventually diagnosed as obstructive jaundice were counted. A total of 106 patients met the criteria and received puncture treatment. Fifty-five of these patients underwent PTGD, and fifty-one of these patients underwent PTCD. Statistics showed that the general situation and clinical data of patients before puncture had no statistical significance, including age, gender, pathological type, bilirubin level and aminotransferase level.

Serum bilirubin and transaminase values were measured one day before operation and seventh

day after operation, including total bilirubin (TBil), indirect bilirubin (IBil), direct bilirubin (DBil), aspartic aminotransferase (AST) and alanine aminotransferase (ALT). The decrease rate of serum bilirubin level and aminotransferase level before and after puncture was calculated, statistical comparison was made. Various postoperative complications were recorded and the incidence of each complication was compared.

2.2 Puncture Methods

The patient was supine or lateral decubitus, ultrasound was used to determine the best puncture site in real time, the puncture site should be disinfected. The axillary front or midaxillary line between 7 and 9 intercostals is generally chosen as the puncture point. The liver capsule was anesthetized with 2% lidocaine. Make an incision of about 2-3 mm in the skin of the puncture point, and puncture the gallbladder or bile duct through the skin and liver with a puncture needle. Connect the external drainage tube and secure the drainage tube.

3. Statistical Analysis

Analysis of variance was used for statistical analysis. When $P < 0.05$ is considered to be a significant difference.

4. Comparison of Puncture Effect

Both PTCD and PTGD under ultrasound guidance can reduce jaundice and improve liver function. Elevated bilirubin and transaminase were still seen in a few patients. There were no significant differences in serum bilirubin and transaminase decrease rate between PTGD group and PTCD group ($P > 0.05$). There were no statistically differences in each group, including AST, ALT, TBil, DBil and IBil groups, and no statistically significant differences in complication rate ($P > 0.05$) (Table 1-2).

Table 1 Statistics of Changes in Different Assay Indicators

Indicators	PTGD R ¹	PTCD R ²	<i>P</i> value
ALT	-0.36±0.11	-0.41±0.08	0.40
AST	-0.23±1.75	-0.43±0.12	0.29
TBil	-0.44±0.06	-0.32±0.15	0.06
DBil	-0.45±0.08	-0.34±0.18	0.13
IBil	-0.31±0.03	-0.35±0.02	0.91

R¹ and R² are the average change rates of different indicators before and after surgery. *P* is the comparison of the rates change between the two groups.

Table 2 Statistics of Complications

complications	Population		<i>P</i>
	PTGD R ¹	PTCD R ²	
Infection	0.036	0.039	0.934
Bleeding	0.055	0.039	0.707
Bile leakage	0.073	0.078	0.912

R¹ and R² represent the incidence of different complications.

P represents the comparison of the incidence of complications between PTCD group and PTGD group.

5. Discussion

Malignant obstructive jaundice may cause many symptoms of discomfort and reduce the patient's surgical tolerance. Therefore, preoperative reduction of serum bilirubin level in patients with malignant obstructive jaundice can effectively reduce perioperative and postoperative complications.

For patients with malignant tumors resulting in obstructive jaundice, there are two methods

usually used in clinical practice: PTCD and endoscopic nasobiliary drainage (ENBD). However, the application of ENBD is limited due to its difficult operation and many complications. PTCD not only reduces jaundice quickly, but is also cheaper and safer [1]. Although endoscopic retrograde cholangiopancreatography(ERCP) is also an option for these patients, PTCD is still more popular with patients and doctors[2].

Pancreaticoduodenectomy is the basic method to solve the obstruction in low obstructive jaundice patients.[3]. Biliary drainage is often performed before surgery to improve the perioperative safety. [4]. Both ultrasound-guided PTCD and PTGD can significantly reduce serum bilirubin level before surgery. PTCD operation is often accompanied by vascular and bile duct damage, so it can cause many complications. PTGD can penetrate into the gallbladder directly without damaging blood vessels, so the complications were less. Therefore, PTGD is often the operator's first choice. However, PTCD is also a very good method to reduce serum bilirubin level for patients PTGD cannot be performed. Our study showed that PTCD and PTGD showed no difference in reducing serum bilirubin level and promote liver function recovery in obstructive jaundice patients. So the two treatments can be chosen according to the patient situation.

For patients with acute gallbladder inflammation, who cannot be operated immediately. Puncture and drainage can well reduce serum bilirubin level and promote the inflammation controlling, in order to facilitate follow-up surgery as soon as possible. For these patients, preoperative puncture and serum bilirubin reduction are quite important.[5]. Although PTCD drainage was mostly used in patients with cholecystitis, the incidence of complications in both treatments was low, and the difference was not statistically significant[6].

6. Conclusion

In conclusion, ultrasound-guided PTCD and PTGD are effective treatments that can reduce serum bilirubin level in clinical practice, there were no significant differences in treatment outcomes between the two treatments.

References

- [1] Kyun, H.S., et al., Comparison of clinical outcome and cost-effectiveness after various preoperative biliary drainage methods in periampullary cancer with obstructive jaundice. *Journal of Korean medical science*. 2012. 27(4), 356-362.
- [2] Saluja, S.S., et al., Endoscopic or Percutaneous Biliary Drainage for Gallbladder Cancer: A Randomized Trial and Quality of Life Assessment, *J Clinical Gastroenterology and Hepatology*. 2008. 6(8), 944-950.
- [3] Sizhen, W., et al., Association of preoperative obstructive jaundice with postoperative infectious complications following pancreaticoduodenectomy. *Hepato-gastroenterology*. 2013. 60(126), 1274-1279.
- [4] Moole H, Bechtold M, Puli S R. Efficacy of preoperative biliary drainage in malignant obstructive jaundice: a meta-analysis and systematic review[J]. *World journal of surgical oncology*, 2016, 14(1): 1-11.
- [5] Ambe P C, Christ H, Wassenberg D. Does the Tokyo guidelines predict the extent of gallbladder inflammation in patients with acute cholecystitis? A single center retrospective analysis[J]. *BMC gastroenterology*, 2015, 15(1): 1-8.
- [6] van Delden O M, Laméris J S. Percutaneous drainage and stenting for palliation of malignant bile duct obstruction[J]. *European radiology*, 2008, 18(3): 448-456.