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Case Report / Olgu Sunumu

Multiple Common Bile Duct and Gallbladder Stones Treated with T-Tube Drainage

T-Tüp Drenajı ile Tedavi Edilen Çoklu Ana Safra Kanalı ve Safra Kesesi Taşları

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ABSTRACT

This case report presents the treatment process with T-tube drainage of a patient with multiple common bile duct and gallbladder stones. A twenty-nine-year-old female had abdominal pain, nausea, and vomiting for about three days. The patient had twice a history of removing common bile duct stones with endoscopic retrograde cholangiopancreatography (ERCP). She had right upper quadrant pain and defence on deep palpation on the physical examination of the abdomen. In the laboratory, she had increased a c-reactive protein level (CRP) (9.4 mg/L) and a gamma-glutamyl transferase level (65 U/L). Magnetic resonance cholangiopancreatography (MRCP) showed multiple calculi on the gall bladder and common bile duct. Surgery was planned for the patient because of the large number of stones in the common bile duct. The surgery started laparoscopically, but laparotomy was performed due to laparoscopic difficulty. Seven stones were removed from the common bile duct, and a T-tube was placed in the common bile duct. Since contrast extravasation and obstructive pathology were not detected in T-tube cholangiography performed on the 15th postoperative day, the T-tube was removed. The patient was discharged on the 17th postoperative day without complications.

Keywords: Cholangiographies, Cholelithiasis, Common bile duct

ÖZ

Bu vaka raporu, çok sayıda koledok ve safra kesesi taşı olan bir hastanın T-tüp drenajı ile tedavi sürecini sunmaktadır. Yirmi dokuz yaşında bir kadında yaklaşık üç gündür karın ağrısı, mide bulantısı ve kusma vardı. Hastanın iki kez endoskopik retrograd kolanjiyopankreatografi (ERKP) ile koledok taşlarını çıkarma öyküsü vardı. Karın fizik muayenesinde sağ üst kadran ağrısı ve derin palpasyonda defans vardı. Laboratuvarda c-reaktif protein (CRP) (9.4 mg/L) ve gama-glutamil transferaz (65 U/L) düzeyleri yükseltmişti. Magnetik rezonans kolanjiyopankreatografi (MRKP)'de safra kesesi ve ana safra kanalında çok sayıda taş vardı. Ana safra kanalında taş çokluğu nedeniyle hastaya cerrahi planlandı. Ameliyat laparoskopik olarak başladı, ancak laparoskopi zorluğu nedeniyle laparotomi yapıldı. Ortak safra kanalından yedi taş çıkarıldı ve ana safra kanalına bir T-tüp yerleştirildi. Postoperatif 15. günde yapılan T-tüp kolanjiyografide kontrast ekstravazasyonu ve obstrüktif patoloji saptanmadığı için T-tüp çıkarıldı. Hasta postoperatif 17. günde komplikasyonsuz olarak taburcu edildi.

Anahtar Kelimeler: Kolanjiyografiler, Kolelitiazis, Ortak safra kanalı

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Introduction

Gallstones constitute a significant health problem in developed societies, and the primary treatment for gallstones is cholecystectomy. Although the prevalence of gallstones varies in epidemiological studies, the estimated prevalence is 10-15% (1). Most cases of gallstones are asymptomatic, but biliary colic, obstructive jaundice, acute pancreatitis and cholangitis may develop due to temporary/permanent obstruction at any part of the biliary tree (2).

Choledocholithiasis develops as primary or secondary due to gallstones in the gallbladder falling into the common bile duct (3). Bile stasis, autonomic neuropathy, chemical imbalance, pH imbalance, increased bilirubin secretion, bile sludge formation, and increased cholesterol secretion are the main factors causing stone formation. Patients with choledocholithiasis admit to upper right quadrant pain, jaundice, fever, nausea and vomiting, and clay-coloured stools. At diagnosis, increased cholestatic and liver degradation enzymes suggest biliary tract obstruction (4). Bilirubin and alkaline phosphatase (ALP) elevation are helpful in the diagnosis of biliary obstruction, but they are not sensitive and specific.

Endoscopic retrograde cholangiopancreatography (ERCP) is the gold standard for diagnosing choledocholithiasis. ERCP has therapeutic advantages over ultrasonography (USG) and magnetic resonance cholangiopancreatography (MRCP) and has replaced surgery in many centres for choledochal stone extraction (5). However, surgical treatment is essential in cases of choledochal stones not removed in ERCP and detected intraoperatively.

This case report presents the treatment process with T-tube drainage of a patient with multiple common bile duct and gallbladder stones.

Case report

A twenty-nine-year-old female was admitted to a tertiary health centre's general surgery outpatient clinic with abdominal pain, nausea, and vomiting for about three days. The patient, who had no other disease or history of surgery, had a history of removing common bile duct stones with ERCP twice in 2021. Her vital findings on admission were as follows: blood pressure: 128/68 mm Hg, pulse rate: 82 beats per minute, oxygen saturation on room air: 96%, and body temperature: 36.7° Celsius. She had right upper quadrant pain and defence on deep palpation on the physical examination of the abdomen. Other system examinations, including the digital rectal examination, were routine.

In the laboratory, she had increased a c-reactive protein level (CRP) (9.4 mg/L) and a gamma-glutamyl transferase level (65 U/L). On MRCP, there were multiple calculi on the gall bladder and common bile duct (Figure 1). Cholecystectomy and choledochal exploration were planned. Surgery was started with four-trocar laparoscopy. After dissection at Calot's triangle, cystic ductus and cystic arteria were attempted to isolate. A laparotomy was planned because there was a stone stuck at the opening of the cystic duct to the common bile duct, and there were many common bile duct stones in the preoperative imaging. During laparotomy, cholecystectomy was performed firstly. After that, the common bile duct was opened, and seven calculi were extracted from the common bile duct (Figures 2 and 3). The common bile duct was irrigated with sterile saline. The proximal side and the duodenal entrance of the common bile duct were checked with a catheter to investigate any obstructive stone. It was found that there was no problem on both sides. A T-tube was inserted into the common bile duct and was fixed with 5/0 polydioxanone sutures. One drain was placed in the subhepatic area (near the common bile duct).

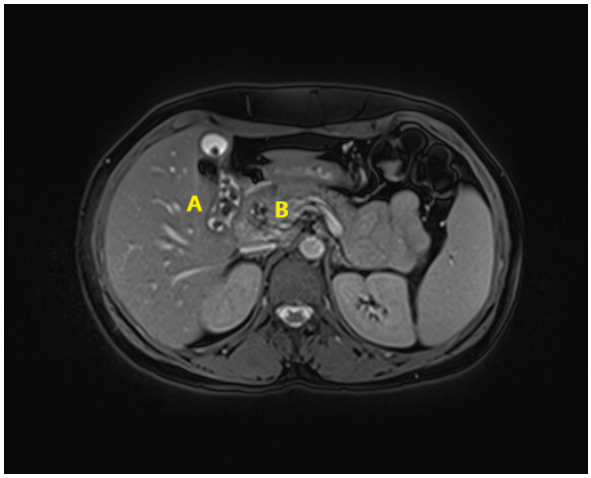

Figure 1. Magnetic resonance imaging shows the gallbladder and common bile duct (A indicates the gallbladder with stones, and B indicates the common bile duct with stones).

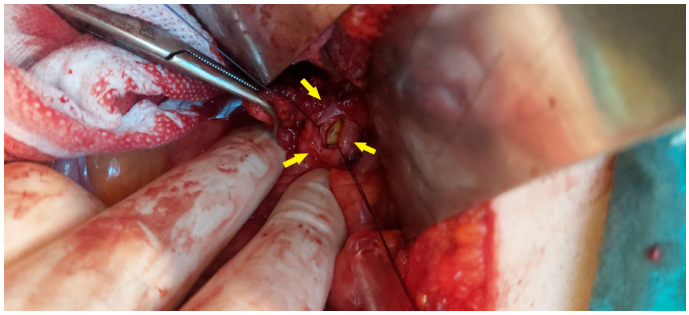

Figure 2. Intraoperative view of the common bile duct a stone (yellow arrows indicate the common bile duct).

Figure 3. Intraoperative view of the operative materials ('A' indicates the common bile duct stones, and 'B' shows gallbladder and stones removed from the gallbladder).

The patient was followed up at the intensive care unit during the postoperative period. Oral intake started on the 6th postoperative hour. Pathological laboratory parameters of the patient on postoperative day 1 were as follows: white blood cell count: 17.1x10^3/mm^3, CRP: 56 mg/L, alanine transaminase (ALT): 120 U/L, aspartate transaminase (AST): 81 U/L, alkaline phosphatase (ALP): 381 U/L, GGT: 171 U/L, total bilirubin (TB): 2.2 mg/dL, and direct bilirubin (DB): 0.8 mg/dL. On the first postoperative day, there was 200 cc of fluid in the subhepatic drain, and 550 cc of bile came from the T-tube. Pathological laboratory parameters of the patient on postoperative day 3 were as follows: white blood cell count: 9.4x10^3/mm^3, CRP: 22 mg/L, ALT: 75 U/L, AST: 59 U/L, ALP: 231 U/L, GGT: 140 U/L, TB: 1.4 138 mg/dL, and DB: 0.6 mg/dL. The patient was transferred to the

service on the 4th postoperative day. All laboratory parameters were at normal ranges on the 5th postoperative day. The subhepatic drain was removed on the 6th postoperative day. T-tube cholangiography was performed on the 15th postoperative day. Since no contrast extravasation and obstructive pathology were found at T-tube cholangiography (Figure 4), and T-tube was removed. The patient was discharged on the 17th postoperative day without complications. No pathology was observed in the patient's first-month follow-up after the T-tube removal.

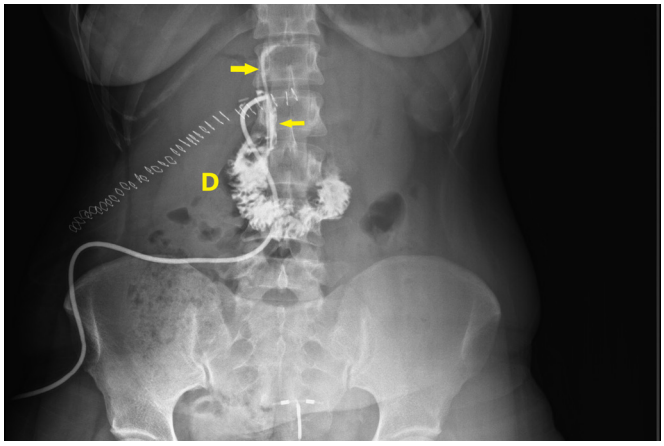

Figure 4. T-tube cholangiogram (Yellow arrows show the T-tube, and 'D' indicates duodenum).

Discussion

Choledocholithiasis develops as primary or secondary due to stones in the gallbladder falling into the common bile duct (6). Common bile duct stones may fall into the duodenum spontaneously, or they obstruct bile flow in the common bile duct. This obstruction can cause pancreatitis, cholecystitis, and cholangitis with the effect of reverse bile flow (7). Patients with biliary obstruction admit with upper right quadrant pain, jaundice, fever, nausea and vomiting, and clay-coloured stools. At the time of diagnosis, increased infective parameters and cholestatic and liver degradation enzymes suggest biliary tract obstruction. The risk of choledocholithiasis is 10-50% in patients with a history of pancreatitis and jaundice, multiple gallstones (<1cm), and increased bilirubin and ALP values. Choledochal stones are less than 5% in cases with no history of pancreatitis or jaundice, normal liver enzymes, and gallstones larger than 1 cm (8). Peng et al. showed that increasing GGT above 90 U/L without significant jaundice is an essential clue for choledocholithiasis (6). In the present case, the patient was admitted with abdominal pain, nausea, and vomiting for about three days. Only mild CRP and GGT serum levels increase were current.

Abdominal ultrasonography (USG), MRCP, and ERCP are the techniques for evaluating and treating the gallbladder and bile tree (9). USG was the first diagnostic tool to evaluate the gall bladder and biliary tree. USG has a 55-91% sensitivity in detecting common bile duct enlargement. Detection of the choledochal canal over 6 mm on USG indicates a high rate of choledocholithiasis (10). Magnetic resonance cholangiopancreatography (MRCP) is a non-invasive imaging method that has been used for the last few years and still has a very active role in investigating the pancreaticobiliary system (11). MRCP provides detailed information about the gallbladder and even the biliary tree. In a systematic review by Kalthantaner et al., the sensitivity of MRCP for choledocholithiasis was observed in a wide range of 50-100%, while the specificity ranged from 83-100% (12). Apart from all these imaging studies, ERCP provides both diagnosis and treatment of even extrahepatic ducts. ERCP is used in patients with stones detected in MRCP and high cholestatic enzymes. The success of ERCP in removing common bile duct stones is between 85-90% (13). Nowadays, ERCP has become widely used, and with the experience gained, extraction of common choledochal stones has become a less aggressive and preferred approach (14). On the other hand, electrohydraulic lithotripsy (EHL) and extracorporeal shock wave lithotripsy (ESWL) are methods that can be used for stones that cannot be removed by ERCP (15). However, these alternative methods require advanced equipment and experience that may not be available in every centre.

Surgery is an unavoidable treatment for patients with stones in the common bile duct and cannot be removed with ERCP, EHL, and ESWL. Although there is no consensus on the treatment of common bile duct stones accompanying cholelithiasis, it has been suggested that there are different options such as open surgery, laparoscopic surgery and various endoscopic-laparoscopic approaches protocols (16). In selected cases, open surgery is still the preferred method for treating choledocholithiasis accompanying cholelithiasis (17). In patients with choledochotomy, primary closure can be performed after stone removal, or a T-tube can be placed into the common bile duct (18). Direct closure is superior to T-tube in meta-analyses and clinical studies (19, 20). Although primary closure of the common bile duct was shown to be superior in studies, T-tube was preferred for closure of the common bile duct due to the large incision of the common bile duct and the large size of the extracted common bile duct stones.

Another critical issue of choledochotomy with T-tube application is the time of T-tube removal, and there is no consensus on this issue. In the literature, the removal of T-tubes in 7-10 days is considered safe (21). However, in different studies, some recommend removing the T-tubes within 21 days (22, 23). In the present study, we removed the T-tube during the postoperative 2 weeks.

Conclusion

ERCP is the first choice in treating common bile duct stones, and surgical treatment is indicated for large stones that cannot be removed with ERCP and where ERCP is not possible to perform. Surgery can be achieved by open or laparoscopic surgery. Technical possibilities and surgery experience are determinative factors in choosing the surgical technique, and T-tube is a reliable technique for treating common bile duct stones.

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