



Combination Treatment of ERCP Endoscopic Stent Placement and Percutaneous Transhepatic Procedure for Complicated Bile Leakage after Hepatic Resection: A Case Report

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Introduction

Bile leakage is one of the complications that can happen after hepatectomy, which may lead to surgical site infections, abdominal abscess formation, prolonged hospital stay, increase hospital cost, and seriously affect patients' postoperative quality of life. The International Study Group of Liver Surgery (ISGLS) has defined bile leakage as bilirubin concentration in drainage fluid at least three times the serum bilirubin concentration on or after postoperative day 3 or as the need for radiologic or operative intervention resulting from biliary collections or bile peritonitis [1]. According to previous reviews and studies, the

incidence of bile leakage after liver resection without biliary reconstruction ranges from 3.6% to 12% [2]. Leakage can be classified into the central type and peripheral type generally. Current management of post-hepatectomy bile leakage selection is as follows: (1)only drainage, (2)endoscopic or percutaneous transhepatic procedure, (3)portal vein embolization, (4)hepatectomy, (5)fistulojejunostomy and (6) ablation treatment [3].

In our article, we would like to share our experience of treatment in the combination with our gastroenterologist and radiologist for a case with complicated intractable bile leakage status post hepatectomy due to an IHD stone.



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Case

A 53-year-old female had undergone an operation of total left lobectomy (S1, S2, S3, S4), choledocholithotomy with T-tube drainage, and cholecystectomy due to an IHD stone. Bile content was noticed in the JP drain on post-operative day 3. Therefore, an abdomen CT was performed, which showed S5, and S8 liver ischemic change and intra-abdominal abscess formation. The second operation was arranged the next day (POD4) and partial S5, S8 segmental hepatectomy of the congested part was performed. However, leakage of fluid with bile content from the wound was found on POD20 after her first operation and the abdomen CT image was rearranged, which

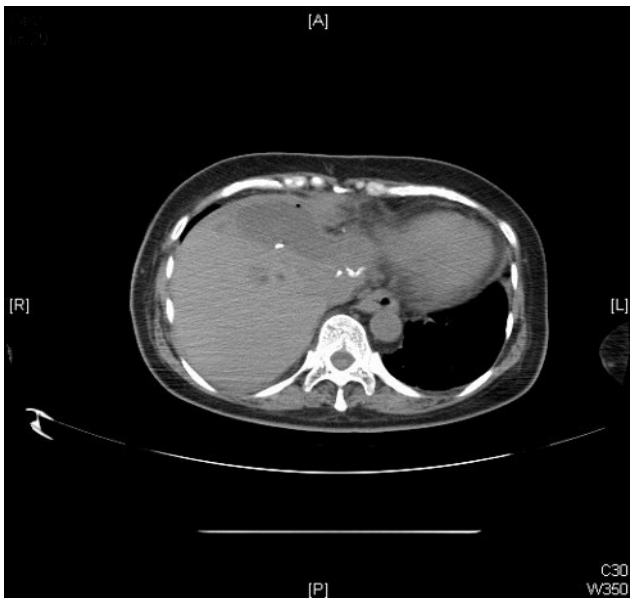


Figure 1: S5, S8 liver ischemic change and intra-abdominal biloma formation on CT image on POD3.



Figure 3a: Percutaneous transhepatic cholangiography performed on POD203.

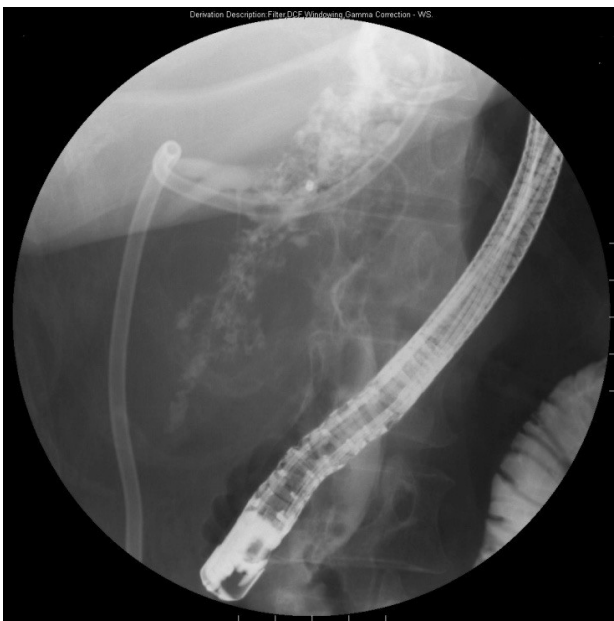


Figure 2: ERCP performed on POD148 showed bile leakage and cannot perform cannulation successfully.



Figure 3b: Second drain placement at right IHD leakage site on POD203.

Because of refractory bile leakage after multiple treatments, including percutaneous drainage, ERCP, NPO, and parental nutrition, she was transferred to our hospital on POD198 for further management. PTC was done by a radiologist, and the pigtail was placed at the right posterior IHD (**Figure 3a,b**).

showed loculated fluid accumulation with an air-fluid level at the resection margin of the right lobe, favoring biloma formation with infective change (**Figure 1**). Percutaneous drainage of the biloma with pigtail was performed on POD21 and continued with drain and antibiotics treatment. The drainage amount of the pigtail did not decrease, with around 200ml/day in later 4 months. The systemic infection condition fluctuated, and could not be controlled completely. The patient was prolonged admitted at the ward with antibiotics treatment and parental nutrition. ERCP with ENBD placement was performed on POD141 and POD 148, but the guide wire could not pass through the leakage site into the right side IHD, and the drainage function was poor with continuous bile leakage from the pigtail (**Figure 2**).

nus. The PTCB was kept inside the right posterior IHD after the procedure. The gastroenterologist tried ERCP for ENBD placement on POD218. A guide wire was successfully inserted from CBD to the sinus, and then to the right anterior IHD. An ENBD catheter was later inserted into the right anterior IHD for bile drainage (**Figure 4**).

The daily ENBD drainage amount was around 10-25ml/day and decrease to 0ml/day on the 9th day after ENBD. The drainage amount of the percutaneous pigtail did not decrease as well. Due to poor diversion function, ERCP re-evaluation was performed 12 days after ENBD placement (POD231). Contrast injection from ENBD catheter found a fluent flow of contrast from right anterior IHD to distal CBD and duodenum without obvious bile leakage (**Figure 5**). Instead, the main leakage from the right posterior IHD was favored. A plastic stent was inserted to the right posterior segmental IHD (**Figure 6**). In a later clinical course, the daily output of the PTCB at right posterior IHD was around 200ml/day and the drainage amount of the percutaneous pigtail decrease to around 50ml/day. The patient's clinical condition improved and infection was controlled well with normal oral intake after successful combined external and internal drainage. The patient was discharged on POD247 after her first operation with outpatient clinic follow-up.

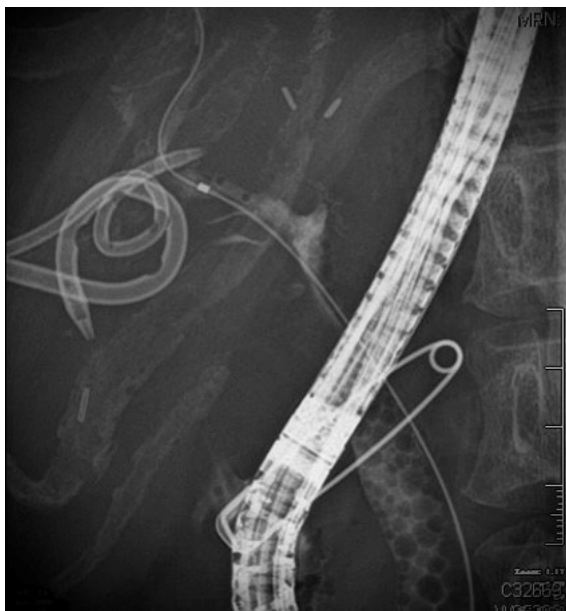


Figure 4: ENBD placement on POD218, to right anterior IHD, with sharp angulations.

Discussion

Bile leakage is a relatively common complication after hepatic resection. The severity of bile leakage can vary from minor leakage which will decrease by proper drainage and will not change clinical management to uncontrollable leakage which might need aggressive intervention or operation and cause intra-abdominal infection. Bile leakage will increase the length of hospital stay, cost, and quality of life, cause many morbidity and mortality. As mentioned above, central type post-hepatectomy bile leakage can be treated by drainage, endoscopic or percutaneous drainage, ablation, embolization, re-operation, or fistuloplasty.

In previous studies, complicated hepatic resection is one of the risk factors of post-hepatectomy bile leakage [3-5]. Endoscopic nasobiliary drainage and endoscopic bridging stent placement are highly selective methods that could be placed at

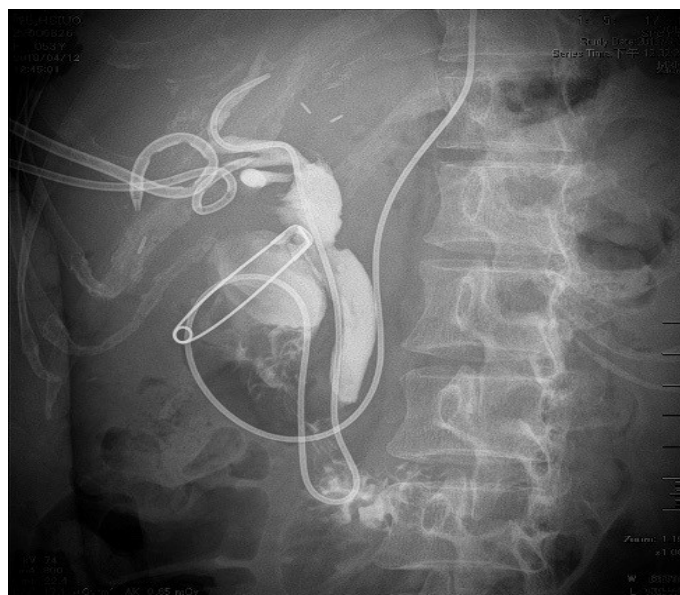


Figure 5: ERCP on POD231, Contrast injection from ENBD catheter found a fluent flow of contrast to distal CBD and duodenum and no obvious bile leakage was noticed.

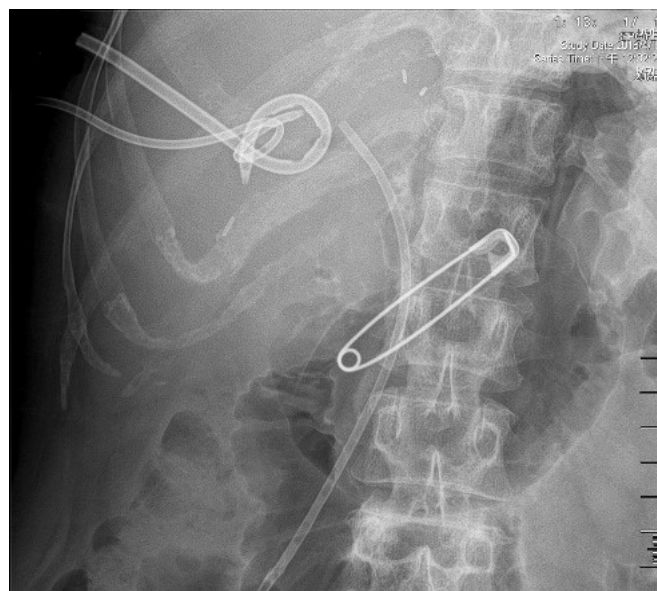


Figure 6: ERCP on POD231, stent placement at right posterior IHD for peritoneal drain.

the transected part of the biliary system. Deche[^]ne et al reported endoscopic therapy led to the resolution of bile leaks in 72 % of cases with central leaks [6]. Anja et al reported the overall success rate of post-hepatic bile leakage endoscopic treatment in their study was 74% and patients with a centrally located leak that can be bridged with a stent are most likely to benefit from the procedure [7]. Percutaneous transhepatic biliary drainage also offered a very good drainage method for the leakage site. Kazuhiko et al reported that endoscopic or percutaneous transhepatic procedures were performed in 15 cases with central type leakage, and 12 of the cases had resolved by these treatments [3].

We presented a case of right posterior intrahepatic duct complete transection after hepatectomy, who was transferred to our hospital on her POD198 due to persisted bile leakage and refractory systemic infection. Surgical intervention for

the patient contained very high risk and difficulty due to possible adhesion and long-term chronic infection and inflammation. We conducted a multi-disciplinary treatment plan with surgeons, radiologists, and gastroenterologists. The external drainage with PTCD and cholangiography evaluation of the bile duct system was done by the radiologist. The gastroenterologist successfully cannulated the guide wire from leakage sinus into the right side IHD, and internal drainage with plastic stent was done. After the multi-disciplinary work, this difficult case with major injury of right side IHD and refractory systemic infection was successfully treated. The patient is under our regular out-patient clinic follow-up under stable condition.

Conclusion

As the improvement of intervention therapy and skills, and complicated bile leakage patients like our case that are not suitable for surgical treatment can be treated by percutaneous drainage and endoscopic stent placement by the cooperation of the radiologist and gastrointestinal specialists. Through interdisciplinary and interprofessional discussion and collaboration, challenging problems like this case could be solved by interventional, non-surgical, and highly selective approaches.

Disclosure

All authors declare that they have no conflicts of interest or financial ties to disclose.

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