Rendezvous Technique Treatment for Late-Onset Biliary Leakage after Major Hepatectomy of a Living Donor : Report of a Case

Kimura, Koichi

Ikegami, Toru

Yamashita, Yo-ichi

Saeki, Hiroshi

他

https://doi.org/10.15017/1397859

出版情報：福岡醫學雜誌. 104 (9), pp.309-314, 2013-09-25. 福岡医学会
バージョン：
権利関係：

Rendezvous Technique Treatment for Late-Onset Biliary Leakage after Major Hepatectomy of a Living Donor : Report of a Case

Koichi Kimura, Toru Ikegami, Yo-ichi Yamashita, Hiroshi Saeki, Eiji Oki, Tomoharu Yoshizumi, Hideaki Uchiyama, Hirofumi Kawanaka, Yuji Soejima, Masaru Morita, Ken Shirabe, Tetsuo Ikeda and Yoshihiko Maehara

Department of Surgery and Science, Graduate School of Medical Sciences, Kyushu University, Fukuoka 812-8582, Japan

Abstract

Biliary leakage is a major complication after hepatectomy. We report the case of a living-donor liver transplantation (LDLT) donor with a late-onset bile leak from the trifurcation of the hepatic duct who was successfully treated using rendezvous technique. A 52-year-old man underwent extended left hepatectomy for donation and was discharged on postoperative day (PD) 13. However, he was rehospitalized on PD 26 with severe abdominal pain. Physical examination suggested panperitonitis, and abdominocentesis showed bilious ascites. Emergent laparotomy for biliary leakage and peritonitis was performed. There was bilious ascites in the peritoneal cavity. A biliary fistula was recognized at the trifurcation of B8a, B8b, and B5. Intraoperative transhepatic biliary drainage of each bile duct was performed. Endoscopic transpapillary drainage was performed on PD 24. Finally, external drains were removed and complete internal drainage established on PD 70. The bile leak was considered to be the result of injury from electrocautery device. Appropriate making choices of the electrocautery devices enable us to avoid over thermal injury of the liver surface. Rendezvous bidirectional drainage effectively treated late-onset bile leakage from the trifurcation of a hepatic bile duct.

Key words : Living donor liver transplantation・Biliary leakage・Rendezvous technique

Introduction

Living-donor liver transplantation (LDLT) has become an alternative therapy for patients with end-stage liver disease. Donors are healthy individuals and donor safety is the primary concern. In a report of 1,000 LDLTs, major donor complications, including bile duct stricture and biliary leakage, occurred in 3.2% of donors[1]. Other groups have reported rates of biliary complications ranging from 2.4% to 5.3% in Japanese high-volume centers[2]. We have reported a biliary complication rate of 5.3% for LDLT donors at our institution[3].

Biliary leakage remains a common cause of major complications after hepatic resection. Hepatectomies with a wide surface area and those that expose the primary Glisson's sheath present serious risk factors for biliary leakage[4]. More than 70% of cases of biliary leakage are early onset discovered by observing bile coming from the abdominal drain after hepatectomy. On the other hand, almost all late-onset biliary leakage presents as biloma[5].

Leakage due to injury of the bile duct takes longer to cure, but is treatable endoscopically. However, leakage due to division of the bile duct is not controllable and may require a second surgery[6]. Rendezvous technique is useful for refractory biliary complications. Rendezvous technique enables the creation of bidirectional drainage through a combination of percutaneous

Correspondence and reprint requests to : Koichi Kimura, M.D.
Department of 2nd Surgery, The University of Kyusyu, 3-1-1, Maidashi, Higashi-ku, Fukuoka 812-8582, Japan.
Tel : +81-92-642-5466 Fax : +81-92-642-5482
E-mail : cubicseal@gmail. com

and endoscopic procedures for bile duct obstruction[7].

We experienced a case of an LDLT donor with a late-onset bile leak from the trifurcation of the anterior hepatic duct. Bile duct injury resulting from the use of electrocautery device for hemostasis was considered one of the sources of the bile leak. Treatment was able to progress only with the use of rendezvous technique, which made bidirectional drainage possible. We report a case in which rendezvous technique was effective for a postoperative late-onset refractory bile leak.

Case Report

The patient was a 52-year-old male LDLT donor who underwent extended left and caudate lobectomy. He had no immediate postsurgical complications and left the hospital on postoperative day (PD) 13. He presented to the hospital on PD 25 with abdominal pain, and examinations were performed. Abdominal CT scan showed increased ascites compared to a CT scan performed on PD 7. Abdominocentesis demonstrated bilious ascites. Because of panperitonitis from bile leakage, he underwent emergent laparotomy.

A large amount of yellowish, cloudy ascites was observed intraperitoneally at the time of laparotomy. The ascites was removed for exposure of the surgical field. The cut surface of the liver was inspected. The duodenal side of the leakage site was cannulated using 4-French ATOM tube (Atom medical CO, LTD) and intraoperative cholangiogram was performed, which showed a perforated anterior bile duct. Therefore, further inspection was performed to identify peripheral biliary orifices. Three distal orifices were identified (Fig. 1). External drainage of the biliary tract was performed. A guidewire was introduced into the distal orifice of the perforated biliary tract and advanced to penetrate the liver surface. The guidewire was used to establish a transhepatic route from the common bile duct to the extracorporeal space by opening a small hole in the skin, and blunt dissection of the intercostal tissue was performed using a mosquito clamp (Fig. 2A, B). A 5-French plastic tube was then introduced over the guidewire down to the level of the perforated bile duct (B5). The tube along with the guidewire was introduced into the common bile duct (Fig. 2C). The same maneuvers were repeated twice in order to drain B8 two times (Fig. 2D). After obtaining satisfactory hemostasis, the peritoneal cavity was irrigated using warm saline. A 10-mm Pleats drain (SUMITOMO BAKELITE CO, LTD) was placed near the leakage site. The abdominal wall was closed and the surgery was completed. The operating time was 230 min and the blood loss was 300 mL, including the ascites.

An endoscopic retrograde biliary drainage tube was added by endoscopic retrograde cholan-

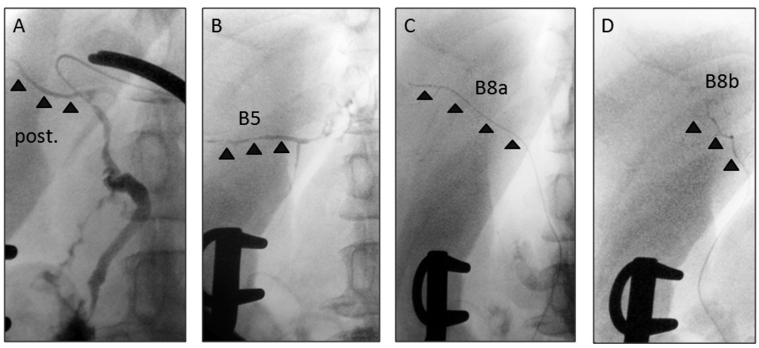

Fig. 1 Intraoperative cholangiogram image. (A) Arrowhead is the posterior branch of the bile duct and the common bile duct. (B) Arrowhead is the B5 branch of the bile duct. (C) Arrowhead is the B8a branch of the bile duct. (D) Arrowhead is the B8b branch of the bile duct.

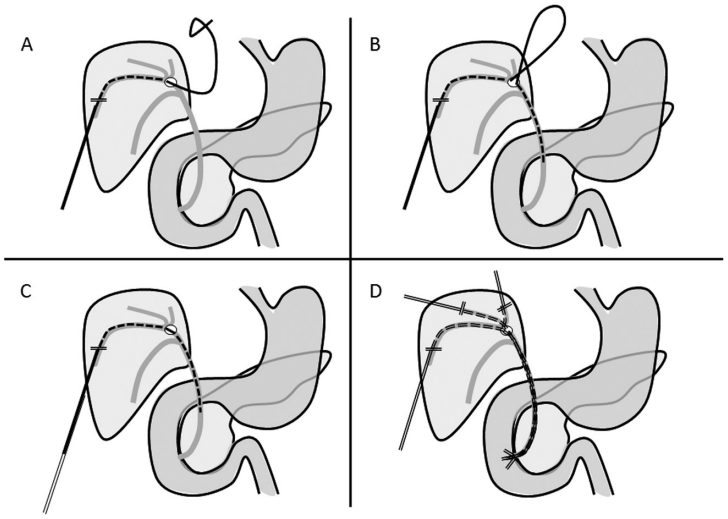

Fig. 2 The scheme of rendezvous technique in this case at surgery. (A) A guidewire was introduced into the distal orifice of the perforated biliary tract and advanced to penetrate the liver surface. The guidewire was guided to the extracorporeal space. (B) The toe of the guidewire was introduced into the central orifice of the perforated biliary tract and guided into the common bile duct. (C) A 5-French plastic tube was introduced over the guidewire down to the level of the perforated biliary duct. (D) The tube along with the guidewire was introduced into the common bile duct. This maneuver was repeated twice.

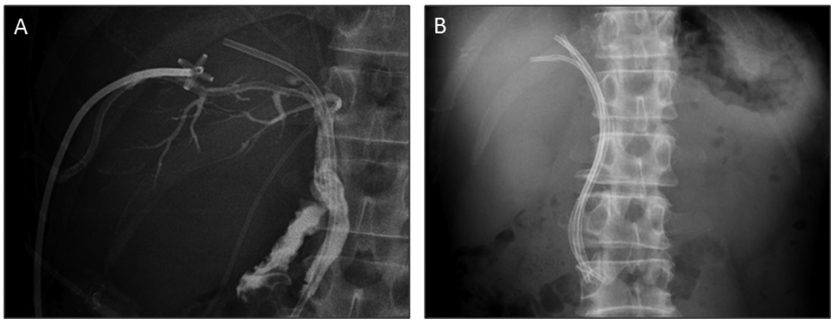

Fig. 3 (A) Bidirectional drainage (rendezvous technique) by adding the ERBD tube. (B) Complete internal drainage. ERBD, endoscopic retrograde biliary drainage.

giography on PD 24 (Fig. 3A). On PD 70, we removed the external tubes and complete internal drainage was achieved (Fig. 3B). Subsequently, no cholangitis developed and replacements of internal drainage tubes have been performed periodically.

Discussion

In this case, although there were no immediate complications after lobectomy, there was a delayed-onset bile leak. One report describes rendezvous technique to be useful in delayed-onset biliary leakage after LDLT[8], but the case reported was not serious and repeat laparotomy was not necessary. In our case, the position of the orifice of the bile duct at the trifurcation of the anterior hepatic duct caused serious bilious peritonitis.

The bile leak in our case was unusual because it did not occur immediately postoperatively and an abdominal CT scan performed on PD 7 revealed no biloma. Thus, this was new delayed-onset bile leakage. Luca et al.[5] reported that 71.0% of cases of biliary leakage are early onset discovered by

observing bile coming from the abdominal drain after hepatectomy, and that almost all late-onset biliary leakage presents as biloma. Presentation of bile from the abdominal drain indicating leakage presentation is reported to have a median delay from liver resection of 4 days (range, 1-10 days), and biloma has a median delay from surgery of 16.5 days (range, 6-39 days)[5]. One of the causes of delayed bile leakage is thermal injury from a cautery device. In our case, the resection surface of the liver was very close to the anterior branch of Glisson's sheath, and injury to the sheath from the soft-coagulation monopolar device used to achieve hemostasis was considered one of the sources of the bile leak. Gerlach et al.[9] reported a case of major bile duct injury from a monopolar energy device. Monopolar energy devices minimize blood loss by creating regions of coagulation necrosis[10]. Despite this advantage, however, monopolar energy devices have been associated with increased complications ; in particular, an increased incidence of biliary leakage, abscesses, and parenchymal damage[11)12)]. Monopolar energy devices disperse energy in all directions. In our case, the anterior branch of Glisson's sheath close to the cut surface of the liver was injured as a result of this energy diffusion.

Nagao et al.[6] classified bile leaks after hepatectomy into four groups : Type A is a minor leakage of only a small amount of bile, type B is a major leak resulting from insufficient closure of the bile duct stump, type C is a major leak caused by injury to the bile duct, and type D is a major leak resulting from division of the bile duct. The results of their data analysis showed that patients whose fistulogram showed proximal bile duct leaks (types B and C) took longer to heal than those without bile duct involvement (type A) (102.6 vs. 37.8 days). The patient with a demonstrable peripheral bile duct leak (type D) suffered uncontrollable leakage and required a second surgery. In our case, the biliary orifice was at the point of trifurcation of the anterior branch. This is a mixed Nagao classification type C and type D and was therefore considered refractory to treatment. Most authors have advocated conservative (endoscopic) treatment as the initial approach and surgical intervention if conservative management fails[4)13)].

When selective common bile duct cannulation cannot be performed during endoscopic retrograde cholangiography despite attempts using various endoscopic techniques, percutaneous transhepatic cholangiodrainage followed by rendezvous technique is often successful[7)14)~17)]. This combined technique increases the success rate of biliary tract cannulation and facilitates the diagnosis and treatment of biliary tract diseases. In our case, we made good progress using rendezvous technique, which allowed us to perform bidirectional drainage. We placed tubes from the internal fistula to the external fistula at the time of repeat laparotomy. That is the point that different from other reports. Almost all reports about rendezvous technique describe the combination techniques of endoscopic retrograde cholangiography and percutaneous transhepatic cholangiodrainage[18]. We performed bidirectional canulation and detained tubes from the fistula of bile duct during surgery. It enabled bidirectional drainage and treatment for the bile leak to proceed, suggesting that treatment of biliary leakage using rendezvous technique is useful in the management of a delayed-onset bile leak.

In summary, we have reported a case of an LDLT donor with panperitonitis from delayed-onset intractable biliary leakage. One cause of this bile leak was considered to be injury from an electrocautery device. Bidirectional drainage using rendezvous technique was a useful treatment for delayed-onset intractable biliary leakage.

References

1) Hwang S, Lee SG, Lee YJ, Sung KB, Park KM, Kim KH, Ahn CS, Moon DB, Hwang GS, Kim KM, Ha TY,Kim DS, Jung JP and Song GW : Lessons learned from 1,000 living donor liver

transplantations in a single center : How to make living donations safe. Liver Transpl. 12 : 920, 2006.
2) Kokudo N, Sugawara Y, Imamura H, Sano K and Makuuchi M : Tailoring the type of donor hepatectomy for adult living donor liver transplantation. Am J Transplant. 5 : 1694, 2005.
3) Taketomi A, Kayashima H, Soejima Y, Yoshizumi T, Uchiyama H, Ikegami T, Yamashita Y, Harada N,Shimada M and Maehara Y : Donor risk in adult-to-adult living donor liver transplantation : impact of left lobe graft. Transplantation. 87 : 445-450, 2009.
4) Yamashita Y, Hamatsu T, Rikimaru T, Tanaka S, Shirabe K, Shimada M and Sugimachi K : Bile Leakage After Hepatic Resection. Ann Surg. 233 : 45-50, 2001.
5) Viganò L, Ferrero A, Sgotto E, Tesoriere RL, Calgaro M and Capussotti L : Bile leak after hepatectomy : Predictive factors of spontaneous healing. Am J Surg. 196 : 195-200, 2008.
6) Nagano Y, Togo S, Tanaka K, Masui H, Endo I, Sekido H, Nagahori K and Shimada H : Risk Factors and Management of Bile Leakage after Hepatic Resection. World J Surg. 27 : 695-698, 2003.
7) Martin DF : Combined percutaneous and endoscopic procedures for bile duct obstruction. Gut. 35 : 1011-1012, 1994.
8) Miraglia R, Traina M, Maruzzelli L, Caruso S, Di Pisa M, Gruttadauria S, Luca A and Gridelli B : Usefulness of the "rendevous" technique in living related right liver donors with postoperative biliary leakage from bile duct anastomosis. Cardiovasc Intervent Radiol. 31 : 999-1002, 2008.
9) Gerlach TW, Troppmann C and Khatri VP : Major bile duct injury resulting from radiofrequency-assisted hepatectomy. Hepatogastroenterology. 56 : 610-614, 2009.
10) Ayav A, Bachellier P, Habib NA, Pellicci R, Tierris J, Milicevic M and Jiao LR : Impact of radiofrequency assisted hepatectomy for reduction for reduction of transfusion requirements. Am J Surg. 193 : 143-148, 2007.
11) Lupo L, Gallerani A, Panzera P, Tandoi F, Di Palma G and Memeo V : Randomized clinical trial of radiofrequency-assisted versus clamp-crushing liver resection. Br J Surg. 94 : 287-291, 2007.
12) Mitsuo M, Takahiro T, Yasuko T, Masayasu A, Katsuya O, Nozomi S, Yoshihide O and Isamu K : Radiofrequency (RF)-assisted hepatectomy may induce severe postoperative liver damage. World J Surg. 31 : 2208-2212 ; discussion 2213-2214, 2007.
13) Tanaka S, Hirohashi K, Tanaka H, Shuto T, Lee SH, Kubo S, Takemura S, Yamamoto T, Uenishi T and Kinoshita H : Incidence and management of bile leakage after hepatic resection for malignant hepatic tumors. J Am Coll Surg. 195 : 484-489, 2002.
14) Lee TH, Park SH, Lee SH, Lee CK, Lee SH, Chung IK, Kim HS and Kim SJ : Modified rendezvous intrahepatic bile duct cannulation technique to pass a PTBD catheter in ERCP. World J Gastroenterol. 16 : 5388-5390, 2010.
15) Dickey W : Parallel cannulation technique at ERCP rendezvous. Gastrointest Endosc. 63 : 686-687, 2006.
16) Chang JH, Lee IS, Chun HJ, Choi JY, Yoon SK, Kim DG, You YK, Choi MG, Choi KY and Chung IS : Usefulness of the rendezvous technique for biliary stricture after adult right-lobe living-donor liver transplantation with duct-to-duct anastomosis. Gut liver. 4 : 68-75, 2010.
17) Qian XJ, Zhai RY, Dai DK, Yu P and Gao L : Treatment of malignant biliary obstruction by combined percutaneous transhepatic biliary drainage with local tumor treatment. World J Gastroenterol. 12 : 331-335, 2006.
18) Nasr JY, Hashash JG, Orons P, Marsh W and Slivka A : Rendezvous procedure for the treatment of bile leaks and injury following segmental hepatectomy. Dig Liver Dis. 45 : 433-436, 2013.

(Received for publication August 6, 2013)

（和文抄録）

遅発性難治性胆汁漏により汎発性腹膜炎を呈した生体肝移植ドナーの１例
―胆汁漏に対するランデブー法の有用性―

九州大学 消化器・総合外科

木村光一，池上　徹，山下洋市，佐伯浩司，沖　英次，吉住朋晴，内山秀昭，川中博文，副島雄二，森田　勝，調　憲，池田哲夫，前原喜彦

【はじめに】肝切除後の胆汁漏は未だ完全には克服されておらず，難治例も散見される．今回我々は，生体肝移植ドナーの拡大左葉切除術後に，汎発性胆汁性腹膜炎を合併した前区域胆管側壁よりの遅発性胆汁漏の症例を経験した．胆汁漏原因を考察するとともに，治療として経肝的，経乳頭的な双方向性アプローチを駆使したランデブー法が有用であった症例を経験したので報告する．
【症例】52歳男性，生体肝移植ドナーとして当科入院となり，拡大肝左葉切除術を施行．術後26日目に突然の腹痛が出現し，血液検査にて肝胆道系酵素の上昇と腹部CTにて著明な腹水貯留を認めた．腹水穿刺の結果，胆汁漏による汎発性腹膜炎が疑われ緊急開腹術を施行した．手術所見としては，開腹時に多量の胆汁性腹水が見られ，瘻孔部は前・後区域胆管合流付近に認められた．各々にRTBDチューブを留置し経肝的ドレナージと瘻孔部の周囲のドレナージを行った．開腹ドレナージ術術後も難治化が予想されたため，術後24日目にERCでの経乳頭的ドレナージを追加して双方向ドレナージを開始した．術後70日目には完全内瘻化が可能となり良好な経過を得ている．
本症例の胆汁漏の原因の１つとして，肝切裏面にグリソンが近接していたこととエネルギーデバイスの使用からグリソンの熱損傷を考えた．エネルギーデバイスの選択によっては組織への過度な熱損傷が防ぎ得ると考えられる．
【まとめ】難治化が予想される肝切除後の遅発性胆汁漏に対して，ランデブー法を用いることにより良好な経過を辿ることが出来た生体肝移植ドナーの１例を経験した．胆汁漏の原因についても併せて考察し，症例を報告する．