

International Journal of Gastrointestinal Intervention

journal homepage: www.ijgii.org

Case Report

A case with combined postoperative bile leakage and anastomotic stricture after liver transplantation treated with magnet compression anastomosis

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ABSTRACT

Liver transplantation (LT) is a viable treatment for fatal end-stage liver disease. Anastomotic bile leakage and anastomotic stricture are considered as major post-LT complications. Stent insertion by endoscopic retrograde cholangiopancreatography and percutaneous transhepatic biliary drainage is the conventional treatment for post-LT anastomotic biliary stricture. In cases in which these conventional modalities fail, magnet compression anastomosis (MCA) can be applied. We reported a case in which post-LT bile leakage and anastomotic stricture were treated by MCA and using a fully covered self-expandable metal stent (FCSEMS). The FCSEMS was removed 3 months later, at which time the stricture and the leakage had resolved.

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Keywords: Anastomotic leak; Liver transplantation; Magnets; Self expandable metallic stents

Introduction

Liver transplantation (LT) is a viable treatment for fatal end-stage liver disease. Anastomotic bile leakage and stricture are considered as major post-LT complications (incidence, 15%–40%).^{1,2} Nonsurgical treatment, including endoscopic stent insertion and percutaneous transhepatic biliary drainage (PTBD), are frequently performed for bile leakage and stricture with success rates of 51%–71%.^{3–5} In cases in which these conventional modalities fail, magnet compression anastomosis (MCA) can be applied.⁶ We experienced a case in which post-LT bile leakage and anastomotic stricture were treated by MCA and using a fully covered self-expandable metal stent (FCSEMS).

Case Report

A 60-year-old female had combined anastomotic bile leakage and anastomotic stricture on abdominal computed tomography after LT for primary biliary cirrhosis (Fig. 1). PTBD had been inserted for treatment of biliary stricture and percutaneous drain-

age for bile leakage in other hospital. New PTBD was applied on both sides of the bile duct (B7) because the location of the previous PTBD was unsuitable for MCA. After dilation of the PTBD to 18 French, magnets were delivered by endoscopic retrograde cholangiopancreatography (ERCP). PTBD dilation and magnet approximation were successful (Fig. 2). An FCSEMS was inserted into the new fistulous tract formed by MCA and decreased the amount of bile drained (Fig. 3). The FCSEMS was removed 3 months later, at which time the stricture and the leakage had resolved (Fig. 4).

Discussion

Bile duct strictures and anastomotic bile leakage are the most frequent post-LT biliary complications.⁷ Stent insertion by ERCP and PTBD is the conventional treatment for post-LT anastomotic biliary stricture.⁸ However, if the previous anastomotic site cannot be reconstructed by conventional methods, the PTBD catheter should be maintained *in situ*. The likelihood of complications, including infection, is increased with prolonged duration of PTBD catheter indwelling.

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Received December 20, 2019; Revised December 31, 2019; Accepted December 31, 2019

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pISSN 2636-0004 eISSN 2636-0012 <https://doi.org/10.18528/ijgii190023>

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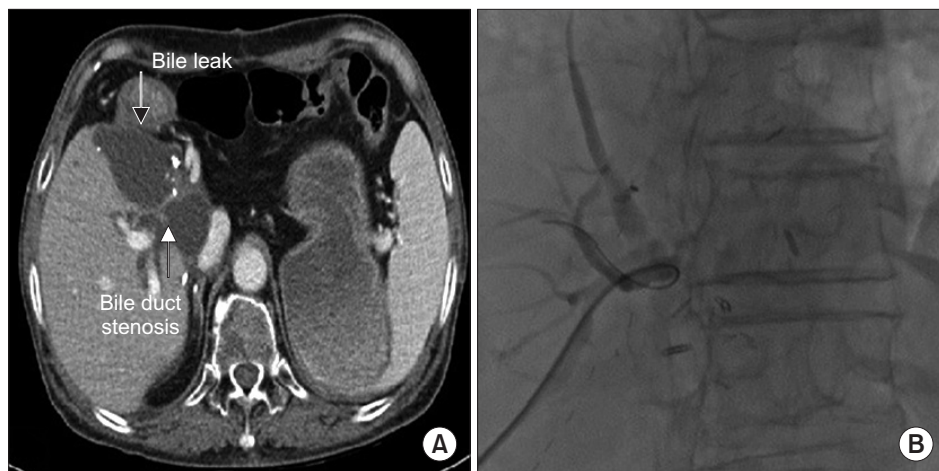


Fig. 1. Combined anastomotic bile leakage and bile duct stricture after liver transplantation (LT). (A) Computed tomography showing combined anastomotic bile leakage and stricture after LT. (B) The guidewire could not be passed through the bile duct by endoscopic retrograde cholangiopancreatography or percutaneous transhepatic biliary drainage.

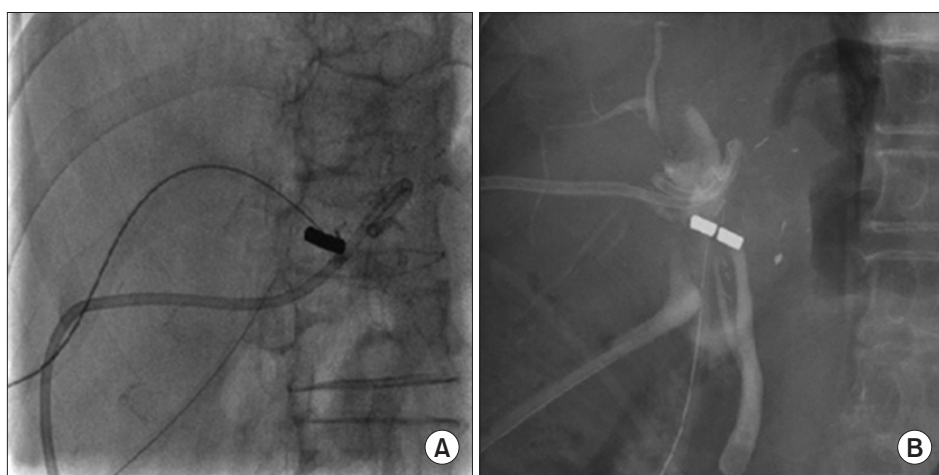


Fig. 2. Magnet insertion by percutaneous transhepatic biliary drainage (PTBD) and endoscopic retrograde cholangiopancreatography. (A) A new PTBD tract was used for alignment of magnets in the B7 branch of the bile duct. (B) The magnets were approximated, and magnet compression anastomosis was successful.

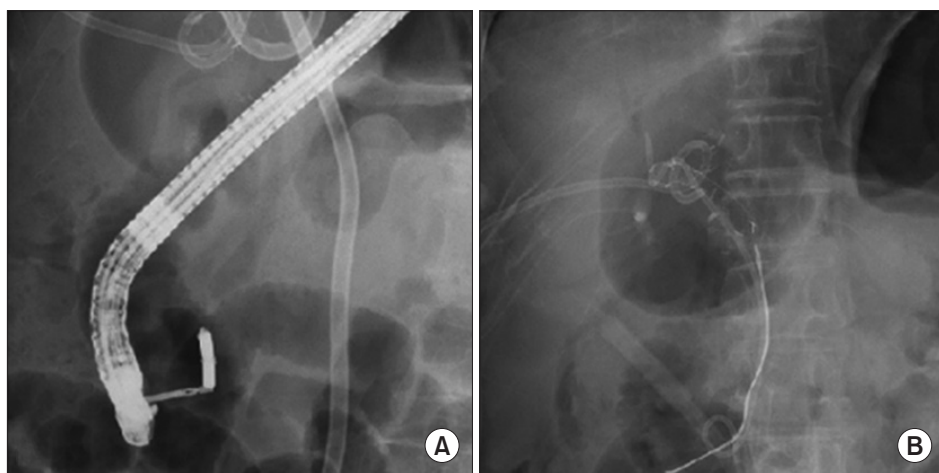


Fig. 3. Magnet removal and insertion of a fully covered self-expandable metal stent (FCSEMS). (A) Four weeks after magnet compression anastomosis, the magnets were removed by endoscopic retrograde cholangiopancreatography. (B) A FCSEMS was inserted into a new fistula tract following removal of the magnets.

MCA is emerging as an alternative treatment for these patients.^{6,9–12} The MCA approach involves insertion of two cylindrical magnets (~4 mm diameter) through the bile duct to close the anastomosis, by transdermal and transpapillary passage.⁹ After alignment of the two magnets, they spontaneously move to the bile duct or gastrointestinal tract. The magnets are retained for more than 8 weeks without migration and can be removed by

percutaneous transhepatic cholangioscopy (PTCS) or ERCP.¹⁰

Bile leakage at anastomotic and non-anastomotic sites, including the T-tube exit site or the graft cut surface in cases of partial liver graft transplantation, occurs in 6%–29% of LT recipients.^{13,14} Leakage occurs most frequently at the biliary anastomotic site due to donor hepatic duct necrosis or hepatic artery thrombosis. In immunosuppressed recipients of LT, bile leakage

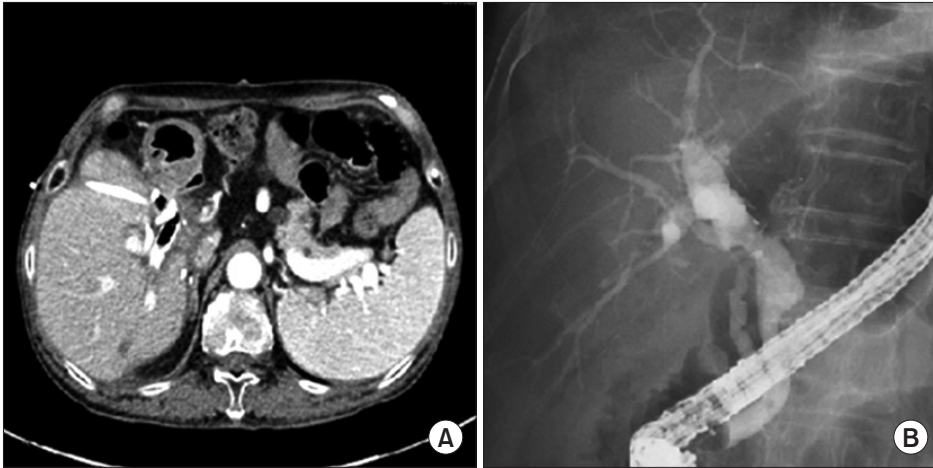


Fig. 4. Healing of the anastomotic bile leakage and stricture and removal of the fully covered self-expandable metal stent (FCSEMS). (A) Computed tomography at 2 weeks after FCSEMS insertion. (B) The anastomotic bile leakage and stricture were successfully managed, and a new anastomosis was seen after removal of the FCSEMS.

can lead to fatal complications such as infection and transplant rejection. To prevent bile leakage, T-tubes can be installed in the bile ducts. However, this procedure is less performed, because it increases the rate of complications such as cholangitis.^{13,14} Bile leakage can be treated by PTBD or endoscopic retrograde biliary drainage. PTBD is performed in patients with Roux-en-Y bile duct anastomosis, and ERCP is performed as the conventional therapy in patients with duct-to-duct anastomosis.^{13,14} However, patients with post-LT bile leakage in whom conventional treatment fails are recommended to undergo insertion of a FCSEMS, which are of large diameter and lead to long-term patency. FCSEMS is more convenient and safer than PTCS for patients with post-LT biliary duct stricture, even if a new bile duct fistula is created after MCA.

Our patient had anastomotic bile leakage through a bile duct stricture and fistula. The bile leakage could be treated only after treating the bile duct stricture; therefore, MCA was performed followed by FCSEMS insertion. If anastomotic bile duct stricture and anastomotic bile leakage occur simultaneously post-LT, the recommended treatment strategy is to resolve the stricture by MCA prior to inserting a metal stent to stop the bile leakage.

Anastomotic bile leakage and stricture are major postoperative complications of LT, but their co-occurrence is uncommon. Although the conventional treatment modalities have high success rates for anastomotic bile leakage and stricture, they are unsuitable in some cases. MCA and FCSEMS insertion may be an alternative treatment for patients with anastomotic bile leakage and stricture for which conventional modalities fail.

Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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References

- Ryu CH, Lee SK. Biliary strictures after liver transplantation. *Gut Liver*. 2011;5:133-42.
- Kao D, Zepeda-Gomez S, Tandon P, Bain VG. Managing the post-liver transplantation anastomotic biliary stricture: multiple plastic versus metal stents: a systematic review. *Gastrointest Endosc*. 2013;77:679-91.
- Kato H, Kawamoto H, Tsutsumi K, Harada R, Fujii M, Hirao K, et al. Long-term outcomes of endoscopic management for biliary strictures after living donor liver transplantation with duct-to-duct reconstruction. *Transpl Int*. 2009;22:914-21.
- Chahal P, Baron TH, Poterucha JJ, Rosen CB. Endoscopic retrograde cholangiography in post-orthotopic liver transplant population with Roux-en-Y biliary reconstruction. *Liver Transpl*. 2007;13:1168-73.
- Born P, Rösch T, Brühl K, Sandschlin W, Allescher HD, Frimberger E, et al. Long-term results of endoscopic and percutaneous transhepatic treatment of benign biliary strictures. *Endoscopy*. 1999;31:725-31.
- Jang SI, Rhee K, Kim H, Kim YH, Yun J, Lee KH, et al. Recanalization of refractory benign biliary stricture using magnetic compression anastomosis. *Endoscopy*. 2014;46:70-4.
- Baron TH, Poterucha JJ. Insertion and removal of covered expandable metal stents for closure of complex biliary leaks. *Clin Gastroenterol Hepatol*. 2006;4:381-6.
- Itoi T, Kasuya K, Sofuni A, Itokawa F, Tsuchiya T, Kurihara T, et al. Magnetic compression anastomosis for biliary obstruction: review and experience at Tokyo Medical University Hospital. *J Hepatobiliary Pancreat Sci*. 2011;18:357-65.
- Jang SI, Lee KH, Joo SM, Park H, Choi JH, Lee DK. Maintenance of the fistulous tract after recanalization via magnetic compression anastomosis in completely obstructed benign biliary stricture. *Scand J Gastroenterol*. 2018;53:1393-8.
- Jang SI, Lee KH, Yoon HJ, Lee DK. Treatment of completely obstructed benign biliary strictures with magnetic compression anastomosis: follow-up results after recanalization. *Gastrointest Endosc*. 2017;85:1057-66.
- Jang SI, Choi J, Lee DK. Magnetic compression anastomosis for treatment of benign biliary stricture. *Dig Endosc*. 2015;27:239-49.
- Jang SI, Kim JH, Won JY, Lee KH, Kim HW, You JW, et al. Magnetic compression anastomosis is useful in biliary anastomotic strictures after living donor liver transplantation. *Gastrointest Endosc*. 2011;74:1040-8.
- Morelli J, Mulcahy HE, Willner IR, Baliga P, Chavin KD, Patel R, et al. Endoscopic treatment of post-liver transplantation biliary leaks with stent placement across the leak site. *Gastrointest Endosc*. 2001;54:471-5.
- Pascher A, Neuhaus P. Bile duct complications after liver transplantation. *Transpl Int*. 2005;18:627-42.