Biliary duct-to-duct anastomosis using magnets in a Billroth II gastrectomy patient

The usefulness of magnetic compression anastomosis (MCA) for biliary duct-to-duct anastomosis had been reported in patients with normal anatomy or after liver transplantation [1–4]. Here we report a case of successful MCA for biliary duct-to-duct anastomosis, carried out in a 65-year-old woman who underwent Billroth II gastrectomy for pyloric stenosis at the age of 17 years. Regarding the patient's present condition, 2 years after liver central bisegmentectomy (with common bile duct preservation) for hepatoma, she developed hilar biliary obstruction. To treat this, we carried out posterior segmental branch percutaneous transhepatic biliary drainage (PTBD). As the patient refused re-operation, we carried out MCA. As described previously [1–3], we initially placed a 16-Fr PTBD tube to dilate the biliary tract, after which two 7-Fr plastic stents were placed up to the right hepatic bile duct using a colonoscope. Magnetic retrograde cholangiopancreatography (MRCP) and computed tomography (CT) revealed that the distance between the PTBD tube and the endoscopic biliary drainage tube was approximately 15 mm (▶ **Fig. 1**). At 2 weeks after stent placement, we carried out MCA. A samarium cobalt rare-earth magnet was advanced in front of the papilla with a biopsy forceps using an oblique-viewing endoscope (XK240, Olympus, Tokyo, Japan). The magnet was then inserted up to the right hepatic duct under fluoroscopic guidance. Another magnet was advanced to the right hepatic duct via the PTBD route, and the two magnets were attracted towards each other (▶ **Fig. 2a**). The following day, the magnets were observed to be almost in total contact with each other (▶ **Fig. 2b**). After 1 month, the two approximating magnets were removed via the PTBD route and a 14-Fr internal fistula tube was placed (▶ **Fig. 3**). To the best of our knowledge, this is the first report on successful MCA in a Billroth II gastrectomy patient. MCA may be beneficial for biliary duct-to-duct anastomosis in selected patients.

Fig. 1 **a** Magnetic resonance cholangiopancreatography (MRCP) showing biliary obstruction between the posterior segmental branch of the bile duct and the common bile duct. **b** The distance between the percutaneous transhepatic biliary drainage tube and the endoscopic biliary drainage tube was confirmed to be 15 mm by abdominal computed tomography (CT).

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Competing interests: None

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Fig. 2 **a** The first magnet was inserted up to the right hepatic duct under fluoroscopic guidance through the papilla. The second magnet was inserted via the percutaneous transhepatic biliary drainage route and placed at a site where it appeared to move toward the first magnet. **b** The following day, the magnets were in almost total contact with each other.

Fig. 3 **a** The two magnets were removed via the percutaneous transhepatic biliary drainage route, and a 14-Fr internal fistula tube was placed. **b** Necrotic tissue was found between the magnets after removal.

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