Title/cover page

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Title: Successful removal of impacted large bile duct stones using electrohydraulic lithotripsy with an ultraslim endoscope after Billroth II gastrectomy

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The diagnostic and therapeutic effectiveness of combined double-balloon endoscopy (DBE) using a short endoscope and peroral direct cholangioscopy (PDCS) with an ultraslim endoscope for altered GI anatomy was demonstrated [1-5]. This method offers the following advantages over mother-baby cholangioscopy for bile duct stone treatment: performed by a single operator, wide working channel, cost performance, and high image resolution. We treated impacted large bile duct stones in a Billroth II gastrectomy recipient using electrohydraulic lithotripsy (EHL) using an ultraslim endoscope.

A 75-year-old man was referred to our hospital for treatment of bile duct stones. He had undergone Billroth II gastrectomy for gastric cancer. Complete stone removal at the previous hospital was difficult, and a plastic stent had been placed. Abdominal CT showed large stones stuck in the bile duct (largest stone diameter, 25mm; Figure 1). We therefore planned to use EHL to crush the stones. First, we advanced a short DBE (EI-580B; working length 1550mm; Fujifilm, Japan) to the papilla and dilated the papilla using a 15mm balloon catheter. Then, we lifted the scope loop, and straightened it. Then, the DBE scope was exchanged for an ultraslim endoscope (EG-L580NW7; outer diameter: 5.8mm; working channel: 2.4mm; Fujifilm), leaving the overtube in place with balloon inflation [1, 2, 5]. The ultraslim endoscope was advanced to the papilla and inserted directly into the bile duct. We performed EHL for stone removal with manual water injection from the

working channel and/or using an endoscopic water pipe system (Figure 2). After sufficiently crushing the stone, we completely removed the stones with a 5-Fr basket (Memory Basket; Cook, Osaka, Japan) and saline injection with an ultraslim endoscope (Figures 3-5). The procedure time was 30 min; there were no adverse events. This combined method was useful for removal of large stones using EHL and achieved clear vison during endoscopic procedure.

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Figure legends

Figure 1: CT image shows numerous impacted stones in the bile duct (arrows); maximum size, 25mm in diameter.

Figure 2: Endoscopic image during EHL

Figure 3: Stone removal with a 5-Fr basket using an ultraslim endoscope

Figure 4: Endoscopic image after stone removal.

Figure 5: Cholangiogram from the endoscopic nasobiliary tube. The stones were completely removed.

Video image: The ultraslim endoscope was inserted into the bile duct with assistance from the overtube.

Video legend

Successful removal of impacted large bile duct stones using electrohydraulic lithotripsy with an ultraslim endoscope in a patient with Billroth II gastrectomy

Video text

Large impacted stones were present in the bile duct.

The loop of the scope was lifted and straightened.

The DBE scope was exchanged for an ultraslim endoscope, leaving the overtube in place with balloon inflation.

The ultraslim endoscope was advanced to the papilla and inserted directly into the bile duct.

We performed EHL for stone removal with water injection from the working channel. We can also use an endoscopic water pipe system.

After sufficiently crushing the stones, they were completely removed using a 5-Fr basket and saline injection with an ultraslim endoscope.

The stones were completely removed.