Feasibility of a thumb-controlled device in double-balloon enteroscopy-assisted ERCP

In recent years, patients with common bile duct calculi and Roux-en-Y anatomy have been treated using double-balloon enteroscopy-assisted endoscopic retrograde cholangiopancreatography (DBE-ERCP). It is known that cannulation in this procedure is difficult [1–3]. We hypothesized that a thumb-controlled device (Smart shooter, TOP corporation, Tokyo, Japan [4]) (● Fig. 1) would be useful for DBE-ERCP. The device enables the operator to control the endoscopic instruments while keeping both hands on the scope. Herein, we present three patients with Roux-en-Y anatomy who underwent DBE-ERCP using the Smart shooter for common bile duct stones. This is the first report of the use of the Smart shooter in actual practice since it became commercially available.

Patient #1 was an 84-year-old man who was referred to our hospital for endoscopic treatment. We attached the Smart shooter to the endoscope. It was easy to achieve and maintain the proper face-on position during the ERCP. After several attempts, taking a period of 7 minutes, we were able to successfully cannulate the bile duct. Stone excision was then successfully performed (● Fig. 2a).

Patient #2 was a 64-year-old woman. As with patient #1, the Smart shooter device allowed the operator to maintain the face-on position, and bile duct cannulation was successful after several attempts over a

period of 4 minutes. Stone excision was successfully performed (● Fig. 2b).

Patient #3 was a 75-year-old woman. In her DBE-ERCP procedure, we required 8 minutes to catheterize the bile duct. Although it was difficult to achieve the face-on position required to keep both hands on the endoscope while simultaneously manipulating the catheter, the bile-duct cannulation was successful on the first attempt. Stone excision was successfully performed (● Fig. 2c).

The use of the Smart shooter device enabled us to achieve a mean cannulation time of 6.3 minutes (range 4–8 minutes; n=3). The same procedure without use of the Smart shooter, required a mean cannulation time of 18.1 minutes (range 4–68 minutes; n=19). This difference was not statistically significant, but the device can improve the ease of cannulation in DBE-ERCP.

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Tetsuo Tamura, Daisuke Kikuchi, Tsunao Imamura, Yuko Koizumi, Rikako Koyama, Mitsuru Kaise, Kazuo Takeuchi

Department of Gastroenterology, Toranomon Hospital, Tokyo, Japan

Fig. 1 The Smart shooter device has two components: the controller (yellow arrow) and the catheter (red arrow). Picture copied from Kikuchi et al. [4].

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Fig. 2 Cholangiographic images showing common bile duct stones (red arrows) in: **a** patient #1; **b** patient #2; **c** patient #3.

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Corresponding author

Tetsuo Tamura, MD
Department of Gastroenterology
Toranomon Hospital
Toranomon 2-2-2
Minato-ku
Tokyo, 105-8470
Japan
Fax: +81-3-35827068
tetsu-t@toranomon.gr.jp