Delayed perforation caused by an endoscopic clip following uncomplicated endoscopic resection of a large sporadic nonampullary duodenal adenoma

A 42-year-old woman was referred for resection of a sporadic, 60-mm, high grade tubulovillous adenoma in the descending duodenum (Fig. 1). Submucosal injection of gelofusine, methylene blue, and diluted adrenaline (Fig. 2) was followed by piecemeal endoscopic mucosal resection (EMR) using an EVIS EXERA II 180 duodenoscope (Olympus, Tokyo, Japan) and snare (SnareMaster SD-230U-20; Olympus). Minor bleeding from vessels along the lateral resection margin settled spontaneously, and two clips (Instinct Hemoclip; Cook Medical, Limerick, Ireland) were placed, taking care to grasp adjacent mucosa (Fig. 3). The EMR site was carefully re-inspected and no further bleeding was observed.

Overnight the patient developed abdominal pain and fever. Computed tomography scan showed a moderate amount of free retroperitoneal air and fluid consistent with duodenal perforation (Fig. 4). Intraoperative findings revealed that one clip had perforated the duodenum, and was protruding into the retroperitoneum. The area was debrided and duodenal exclusion was performed. The perforation was managed with T-tube placement into the duodenal lumen.

Histology confirmed high grade tubulovillous adenoma with no involvement of the muscularis propria. Surveillance endoscopy at 6 months revealed a scar with an adjacent area of residual adenoma that was amenable to further resection (Fig. 5).

EMR is a highly effective and widely practiced method for removing large adenomatous polyps in the gastrointestinal tract [1, 2]. In the richly vascularized, thin-walled, and relatively fixed duodenum, bleeding and perforations are known complications of EMR and the risks increase with polyp size [2, 3]. Delayed bleeding occurs in 30% of cases [4, 5]. Coagulation techniques have been suggested for the treatment of immediate or delayed bleeding, though this may increase the risk of perforation. Endoscopic clips are a well established treatment for bleeding and perforation...
tion in the entire gastrointestinal tract. However, we believe clips should be used with great caution following wide field EMR in the duodenum because of the risk of clip-related delayed perforation.

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**Competing interests:** None

Moritz von Wulffen¹,², Alexander Huelsen¹,², Tom O’Rourke²,³, Nivene Saad²,⁴, Saurabh Gupta¹,²

¹ Department of Gastroenterology and Hepatology, Princess Alexandra Hospital, Brisbane, Queensland, Australia
² School of Medicine, University of Queensland, Brisbane, Queensland, Australia
³ Department of Hepatobiliary Surgery, Princess Alexandra Hospital, Brisbane, Queensland, Australia
⁴ Department of Radiology, Princess Alexandra Hospital, Brisbane, Queensland, Australia

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**Corresponding author**

Moritz von Wulffen, MD
Department of Gastroenterology and Hepatology
Princess Alexandra Hospital
199 Ipswich Road
Woolloongabba
Queensland 4102
Australia
Fax: +61-7-31765111
m.vonwulffen@uq.edu.au