A novel method for closure of a persistent gastrostomy feeding site fistula

Fig. 1 Contrast study of a persistent gastrostomy site fistula in a 22-year-old man presenting with leaking gastric contents 24 months after the removal of a gastrostomy.

A 22-year-old man with congenital intestinal malrotation and autoimmune enterocolitis, previously requiring enteral nutritional support for many years, presented with persistently leaking gastric contents 24 months after the removal of a gastrostomy. Attempted closure with three endoscopic clips at the internal opening 8 months earlier had been unsuccessful.

A contrast study confirmed persistent fistula with a short tract (► **Fig. 1**). While the patient was under general anesthesia, a further procedure was performed comprising closure with silver nitrate cauterization and a 10-mm hexagonal nitinol clip (Padlock-G Clip; Aponos Medical, Kingston, New Hampshire, USA). The internal opening was identified endoscopically (► **Fig. 2a**). The external opening was infiltrated with 7 mL of 1% lignocaine as a local anesthetic. The tract just allowed passage of a 3-mm-diameter silver nitrate (75% w/w) stick for cauterization, with the depth confirmed endoscopically (► **Fig. 2b**). The inner opening and surrounding tissue were drawn into a deployment pod attached to a standard esophagogastroduodenoscope (Olympus, Tokyo, Japan) (► **Fig. 2c**). The 10-mm hexagonal nitinol clip with six inner prongs was then deployed over this pod, with good im-

Fig. 2 Closure of the gastrostomy tract with silver nitrate cauterization and an internal hexagonal nitinol clip. **a** The internal opening is identified endoscopically. **b** The depth of the silver nitrate cauterization is confirmed endoscopically. **c** The inner opening and surrounding tissue are drawn into a deployment pod attached to a standard esophagogastroduodenoscope. **d, e** The 10-mm hexagonal nitinol clip with six inner prongs is deployed over the pod: **d** internal view; **e** external view.

mediate effect (► **Fig. 2d**, ► **Fig. 2e**). The patient reported mild, self-limiting discomfort at the site for 3 days after the procedure, but there was no persistent drainage or abdominal pain at follow-up at 6 months.

Persistence of a gastrocutaneous fistula, defined as the leakage of gastric contents for at least 1 month after the removal of a gastrostomy tube, occurs in up to 34% of patients [1]. Previously, surgical closure was required, but more recently, multiple endoscopic methods with varying efficacy

have been described. These include chemical or electrical cauterization in combination with clip closure [2], endoscopic suturing [3], fibrin glue placement [4], and over-the-scope clip placement [5]. This is the first report to describe the use of a 10-mm hexagonal nitinol clip in combination with silver nitrate cauterization as an effective option for the closure of persistent gastrocutaneous fistula at a gastrostomy site. Apart from causing transient discomfort, the method appears to be safe.

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