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Biliary stent placement with modified Shim technique in a child with tracheoesophageal fistula and esophageal stricture

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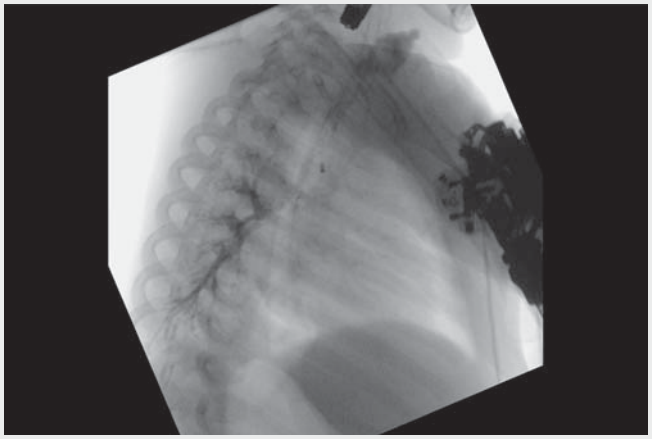
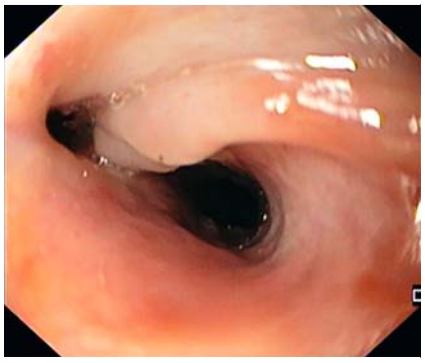
A 2-year-old boy was admitted as an emergency because of ingestion of a button battery. Upper endoscopy revealed a foreign body and circumferential mucosal necrosis at the proximal esophagus. The battery was removed using foreign-body forceps, and esophagography 1 week later showed no complications.

However, a further week later, the child returned with oral intolerance and respiratory distress. Endoscopy revealed a tracheoesophageal fistula (TEF), and he underwent surgery with tracheal and esophageal suturing with muscle flap interposition. There was no clinical improvement and esophagography confirmed persistence of the TEF. The child was referred to us for endoscopic closure (▶ **Video 1**).

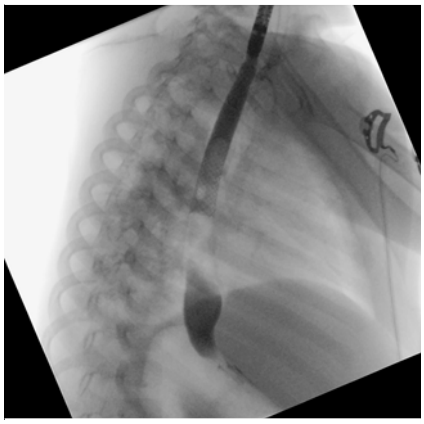
Upper endoscopy revealed a 4-mm esophageal stricture with associated TEF (▶ **Fig. 1**). A fully covered 10×60-mm biliary self-expandable metal stent was placed, traversing the stricture and covering the TEF orifice; contrast extravasation was not seen (▶ **Fig. 2**). A modified Shim technique [1] was applied to avoid stent migration: an endoloop attached to a silk thread was attached to the proximal stent lasso (▶ **Fig. 3**), with the other end of the silk thread being taken round the patient's ear. Despite initial clinical improvement, a later increase of tracheal secretions as well as computed tomography scan confirmed TEF persistence. Upper endoscopy revealed no stent migration but incomplete apposition between the stent and mucosa (▶ **Fig. 4**). Foreign-body forceps were used to reposition the stent 2 cm proximally; fluoroscopy showed no contrast extravasation (▶ **Fig. 5**). Despite clinical improvement, the patient later underwent surgery again, with esophageal suturing, interposition graft with tibial periosteum tissue, and stent removal. The boy remains well 4 months later, without TEF recurrence and with stricture resolution.



Video 1 Placement of a biliary stent with a modified Shim technique in a child with tracheoesophageal fistula and esophageal stricture allowed sealing of the fistula and remodeling of the structure without stent migration.



▶ **Fig. 1** Endoscopic image of proximal esophagus with a 4-mm esophageal stricture and associated tracheoesophageal fistula (TEF) in a 2-year-old boy. He had previously undergone surgical repair of the TEF, which had been caused by ingestion of a button battery.



▶ **Fig. 2** Fluoroscopic image showing absence of contrast extravasation after biliary stent placement in the esophagus.

The small size of the pediatric esophagus and unavailability of dedicated pediatric stents makes esophageal stenting in small children challenging. Most of the literature reports describe treatment of strictures refractory to dilation [2]; however stent migration may occur in up to 29 % of pediatric patients [3]. In this case, we were able to seal a TEF and remodel an esophageal stricture using a modified Shim technique [1] that effectively prevented biliary stent migration.

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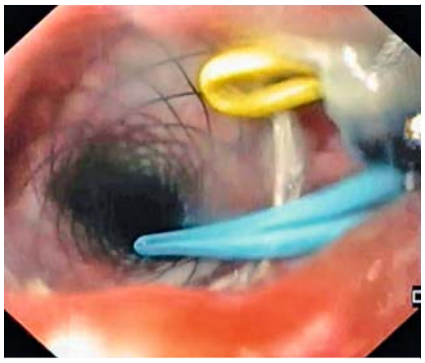
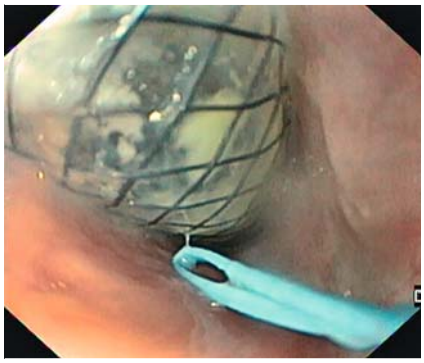
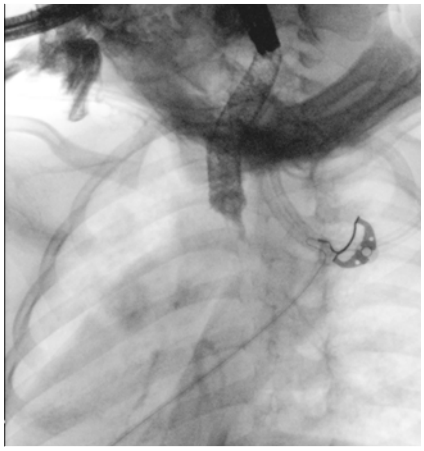


▶ **Fig. 3** Endoscopic image showing correct biliary stent placement, with an endoloop attached to a silk thread at the proximal stent lasso.



▶ **Fig. 4** Endoscopic image showing incomplete apposition between the stent and mucosa, without stent migration.



▶ **Fig. 5** Fluoroscopy showed no contrast extravasation after repositioning of the stent.

Competing interests

The authors declare that they have no conflict of interest.

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References

[1] Shim CS. Esophageal stent for cervical esophagus and esophagogastric junction. Clin Endosc 2012; 45: 235–239
[2] Best C, Sudel B, Foker JE et al. Esophageal stenting in children: Indications, application, effectiveness, and complications. Gastrointest Endosc 2009; 70: 1248–1253
[3] Kramer RE, Quiros JA. Esophageal stents for severe strictures in young children: Experience, benefits, and risk. Curr Gastroenterol Rep 2010; 12: 203–210

Bibliography

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