A rare and potentially fatal complication of endoscopic submucosal dissection: iatrogenic type B aortic dissection

Fig. 1 A 59-year-old man with isolated lower esophageal squamous cell carcinoma received preprocedural computed tomography (CT) scans before endoscopy. **a** Coronal view; **b** axial view showing several calcified atheroma plaques at the aortic arch (arrows). There were no findings of aortic dissection.

Fig. 2 **a** Irregular mucosal lesion (arrow) 1.5 × 1.5 cm in size, 30 cm from the incisors over the right lower posterior aspect of the esophagus. **b** Esophagus perforation was suspected (arrow) when the patient developed hypertension, tachycardia, and subcutaneous emphysema.

Fig. 3 Postprocedural chest computed tomography (CT). **a** Contrast-enhanced sagittal view showed a 3.0-cm aneurysmal dilation between the aortic arch and celiac trunk compatible with acute type B aortic dissection (arrows). There was a hematoma and the dissection extended into the left subclavian artery. **b** The axial view showed the esophagus with endoclips (HX-610, Olympus Inc., Japan) ventrally adjacent to the descending aorta (arrow).

Esophagus perforation occurs in 3%–4% of endoscopic resections [1,2], however, the complication of aortic dissection has not been previously reported. We present the first case in this brief report.

A 59-year-old man with isolated lower esophageal squamous cell carcinoma, stage T1aN0M0 was scheduled for endoscopic submucosal dissection (ESD). The preprocedural chest computed tomography (CT) showed aortic plaques but was otherwise normal (► **Fig. 1**). Total intravenous anesthesia with alfentanil and propofol was used for patient sedation during the endoscopy. An irregular mucosal lesion was found in the right dorsal lower third of the esophagus (► **Fig. 2a**). An ESD was performed using an IT Knife 2 (KD-611 L, Olympus Inc., Japan) and Hook Knife (KD-620LR, Olympus Inc., Japan) following injection of hyaluronic acid and indigo carmine.

The lesion could not be removed en bloc, therefore, it was removed in three pieces using a cap-fitted endoscope. After 45 minutes of procedure time, the patient became hypertensive and tachycardic. Subcutaneous emphysema was found over the lower neck and anterior chest wall. Because perforation was suspected (► **Fig. 2b**), the endoscopist closed the wound and suspended the procedure. Emergency chest CT revealed a new 3.0-cm aneurysm dilation between the aortic arch and celiac trunk diagnostic of acute type B aortic dissection (► **Fig. 3**). After conservative management of blood pressure and pain, the patient was discharged on post-procedural day 14.

To prevent aortic intimal injuries, we note the following potential risk factors: (i) resection of lesions located in the dorsal region of the thoracic part of the esophagus; (ii) gastrointestinal lesions adjacent to pre-existing aortic disease, including atherosclerosis and cystic medial necrosis [3]; (iii) patients with poorly controlled hypertension. Aortic dissection as a result of perforation may be life-threatening if not identified and managed promptly. The endoscopist and anesthesia team need to be aware of this rare complication. Unexpected hypertension or tachycardia with subcutaneous emphysema during endoscopy warrants imaging of the thoracic structures following the procedure.

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