Endoscopic ultrasound-guided tattooing of a retroesophageal parathyroid adenoma

Primary hyperthyroidism (PHPT) results from an ectopic adenoma located in a retroesophageal space in about 3% of cases [1]. In these patients, parathyroidectomy is a challenge even for skilled surgeons due to difficulty in identifying the lesion in a very limited operating space between the cervical and thoracic regions. Preoperative imaging techniques include ultrasound, positron emission tomography-computed tomography (PET-CT) and magnetic resonance imaging (MRI) [2, 3]. Endoscopic ultrasound (EUS) has been proposed as a tool for detecting parathyroid adenomas [4–6]. This report describes the case of a 74-year-old woman with PHPT.

Preoperative 99mTc-sestamibi scintigraphy showed a parathyroid adenoma behind the esophagus, which was confirmed by MRI († Fig. 1) and 11C-methionine PET-CT († Fig. 2). In an attempt to facilitate surgical identification, an operative EUS was performed in order to tattoo the target nodule.

The adenoma was visible from the upper esophagus as a 13-mm iso-hyperechoic nodule with a peripheral cyst, behind the esophagus. A 25-gauge needle (EchoTip Ultra; Cook Medical, Limerick, Ireland) was used under EUS guidance to inject 1 mL of ink into the nodule († Fig. 3). During the injection, a hyperechoic blush was visualized around the tip of the needle. No complications were observed.

The patient underwent surgery 3 days after the tattooing procedure. A video-assisted parathyroidectomy was performed. Behind the esophagus, the black tattooed nodule guided the surgeons to perform a gentle dissection and excision of the adenoma. The tattoo was extremely precise and no ink had spread into the surrounding tissue († Fig. 4). The intraoperative serum parathyroid hormone assay showed a drop to the normal range, and calcium serum level reached the normal value within the first postoperative day.

EUS-guided tattooing has been used to mark the location of small pancreatic neuroendocrine tumors [7]. The present case represents the first report of EUS-guided tattooing of a retroesophageal parathyroid adenoma. Its use for preoperative marking of a small tumor can be helpful to the surgeon by making surgical removal more precise and less invasive and thus avoiding unnecessary dissection.
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Fig. 3 Endoscopic ultrasound-guided fine-needle injection of ink into the parathyroid adenoma. The 25-gauge needle was seen as a hyperechoic line (arrow). 1 mL of sterile purified ink (dilution 0.5:10 000) was injected into the nodule and it was seen as a hyperechoic cloud inside the adenoma.

Fig. 4 The black tattooed nodule guided the surgeons to perform a gentle excision of the adenoma. Pathological analysis confirmed parathyroid adenoma.