Thieme

Cushing's syndrome managed by endoscopic ultrasound-guided radiofrequency ablation of adrenal gland adenoma

A 38-year-old woman presented with "moon face," "buffalo hump," and weight gain of 9 kg in 12 months. Overnight, 1 mg dexamethasone failed to suppress the morning level of cortisol, and the 24-hour urine cortisol level was elevated to 101 µg/day (normal range 0 – 50). Initial contrast-enhanced abdominal computed tomography (CT) showed a 2.8-cm left adrenal mass enhanced in arterial phase, and the patient was diagnosed with Cushing's syndrome due to left adrenal adenoma (▶ **Fig. 1 a**). She refused surgical treatment but agreed to undergo endoscopic ultrasound-guided radiofrequency ablation (EUS-RFA; STARmed, Koyang, Korea) (▶ **Video 1**).

Prior to RFA, contrast-enhanced EUS with SonoVue (Bracco, Inc., Milan, Italy) was performed. Findings of early enhancement and delayed washout were compatible with adrenal adenoma (▶ **Fig. 2 a**).

A 19-guage needle electrode was positioned inside the adenoma. Using real-time EUS imaging, RFA (50 W) was performed at five different sites (▶ **Fig. 2 b**). Four days later contrast-enhanced EUS revealed viable tissue remaining at the marginal edge of the previously ablated portion of the adenoma (▶ **Fig. 3 a**). EUS-RFA was repeated at five more sites in the remaining viable tissue (▶ **Fig. 3 b**). Follow-up CT at 1 week showed the adrenal mass almost completely replaced with necrotic tissue, without complications (▶ **Fig. 1 b**). Serum and urine cortisol levels returned to normal the following day and remained normal for the next 2 months, with no adverse events related to RFA. However after the third month, the cortisol levels were re-elevated and this time the patient agreed to surgery.

Until recently, there were only a few case reports of RFA for the treatment of Cushing's syndrome; all of them were treated via the CT-guided percutaneous method [1, 2]. The present case is the first in which EUS-RFA was used to manage Cushing's syndrome caused by adrenal adenoma. This case report supports EUS-RFA as a safe and feasible alternative method that should be considered in patients who refuse surgical treatment. Further evidence and experiences are required.

▶ **Fig. 1** Computed tomography scan showing a 2.8-cm left adrenal adenoma with arterial enhancement in the coronal view (arrows). **a** Before endoscopic ultrasound-guided radiofrequency ablation (EUS-RFA). **b** After EUS-RFA.

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Competing interests

None

The Authors

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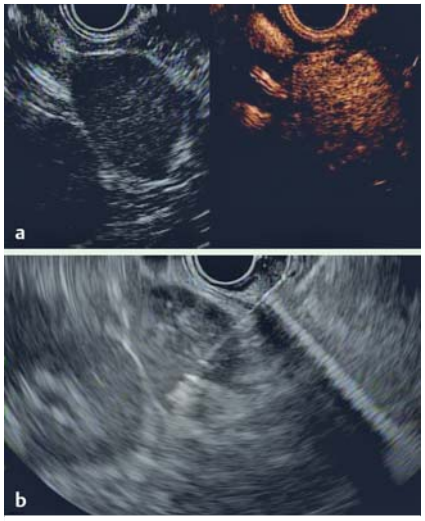
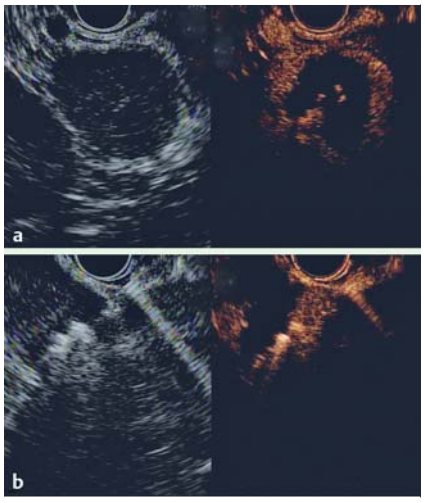
VIDEO 1

▶ Video 1: Endoscopic ultrasound-guided radiofrequency ablation performed on a left adrenal adenoma for the management of Cushing's syndrome.



▶ **Fig. 2** Endoscopic ultrasound-guided radiofrequency ablation (EUS-RFA) of the left adrenal adenoma. **a** Contrast-enhanced EUS with early enhancement. **b** The EUS-RFA needle positioned inside the adenoma.



▶ **Fig. 3** Contrast-enhanced endoscopic ultrasound (EUS) 4 days after the first EUS-guided radiofrequency ablation (RFA) treatment. **a** Central hypo-echogenicity with enhancement remained at the marginal edge of the adenoma. **b** Repeat EUS-RFA was performed.

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