



## Intra-vagal parathyroid adenoma on digital PET/CT with $^{18}\text{F}$ -fluorocholine

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Received: 23 April 2021 / Accepted: 7 June 2021 / Published online: 17 June 2021  
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Parathyroid adenoma within or adjacent to the vagus nerve is a rare ectopia, with only 21 cases reported in the literature [1–3]. A plausible explanation described by Gilmour in 1937 is that parathyroid elements, destined for the inferior parathyroid glands, may segregate and attach to the nerve during embryogenesis [4, 5].

We present a 49-year-old woman with primary hyperparathyroidism complicated by osteoporosis (T-score:  $-3.1$  SD), over 30 episodes of urolithiasis necessitating invasive treatment, and recurrent acute pancreatitis despite the absence of additional risk factors. Ultrasound, technetium-99 m-sestamibi scintigraphy (a), three cervical explorations, and one thoracoscopic thymectomy by experienced surgeons at other medical centers were unsuccessful in revealing a parathyroid adenoma.

Eventually, the patient underwent a fluorine-18-fluorocholine PET/CT with a digital PET scanner (Biograph

Vision, Siemens). This scan revealed a 7 mm intra-vagal parathyroid adenoma with high fluorine-18-fluorocholine uptake (maximum intensity projection, b; axial PET/CT, c). The contrast-enhanced CT (d) and the 3D reconstruction of the PET/CT (e) illustrate the unusual location of the parathyroid adenoma between the left internal carotid artery and the jugular vein, 2 cm cranially to the carotid bifurcation. The nodule was successfully resected, and subsequently, the serum parathyroid hormone decreased from 25 to 0.9 pmol/L (reference values: 1.1–6.8 pmol/L).

The improved spatial resolution and contrast of digital PET facilitate the detection of small lesions [6]. Together with the high accuracy of fluorine-18-fluorocholine PET [7], it provides the opportunity to improve the diagnostic work-up and thus the surgical management of patients with intra-vagal parathyroid adenoma.

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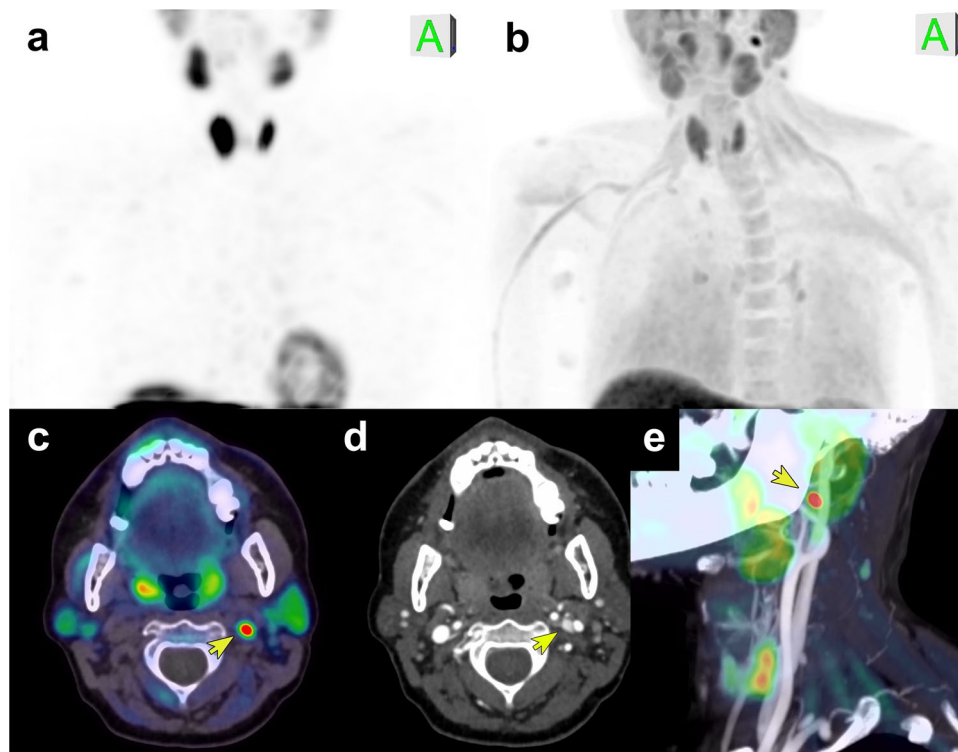
This article is part of the Topical Collection on Endocrinology

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**Author contribution** All authors approved the contents of the manuscript and its submission. The manuscript is not under review by any other journal.

**Funding** Open Access funding provided by Université de Genève.

## Declarations

**Ethics approval** For this type of retrospective case report, formal consent from the institutional ethics research committee is not required.

**Consent for publication** Informed consent was obtained from the patient for publication of this case report and accompanying images.

**Competing interests** The authors declare no competing interests.

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