



# Unusual Uptake of [<sup>131</sup>I] in a Tenosynovial Giant Cell Tumour Relapse in a Patient with Differentiated Thyroid Cancer

Diferansiye Tiroid Kanserli Bir Hastada Tenosinovyal Dev Hücreli Tümör Nüksünde Olağandışı [<sup>131</sup>I] Tutulumu

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## Abstract

A 77-year-old woman with follicular thyroid cancer underwent total thyroidectomy and subsequent Iodine-131 remnant ablation. She had a history of a wide tenosynovial giant cell tumor (TGCT) of the right wrist and hand that had been resected thirteen years ago. Post-therapeutic scintigraphy and single photon emission computed tomography showed mild uptake on the distal right forearm, wrist and hand. Magnetic resonance imaging and posterior histopathology confirmed a relapse of TGCT. No radioiodine adverse effects were reported after a one-year follow-up. As far as we know, this report is the first in the literature to a TGCT visualized on post-therapy radioiodine scan.

**Keywords:** Giant cell tumor of tendon sheath, thyroid neoplasms, scintigraphy, magnetic resonance imaging

## Öz

Foliküler tiroid kanserli 77 yaşında bir kadına total tiroidektomi ve ardından İyot-131 remnant ablasyonu uygulandı. On üç yıl önce rezeke edilmiş sağ el bileği ve elde geniş tenosinovyal dev hücreli tümör (TGCT) öyküsü vardı. Tedavi sonrası sintigrafisi ve tek foton emisyon tomografisi distal sağ önkol, el bileği ve elde hafif tutulum gösterdi. manyetik rezonans görüntüleme ve posterior histopatoloji, TGCT'nin relapsını doğruladı. Bir yıllık takipten sonra hiçbir radyoyodin yan etkisi bildirilmemiştir. Bildiğimiz kadarıyla bu rapor, tedavi sonrası radyoyot taramasında görüntülenen bir TGCT'nin literatürdeki ilk raporudur.

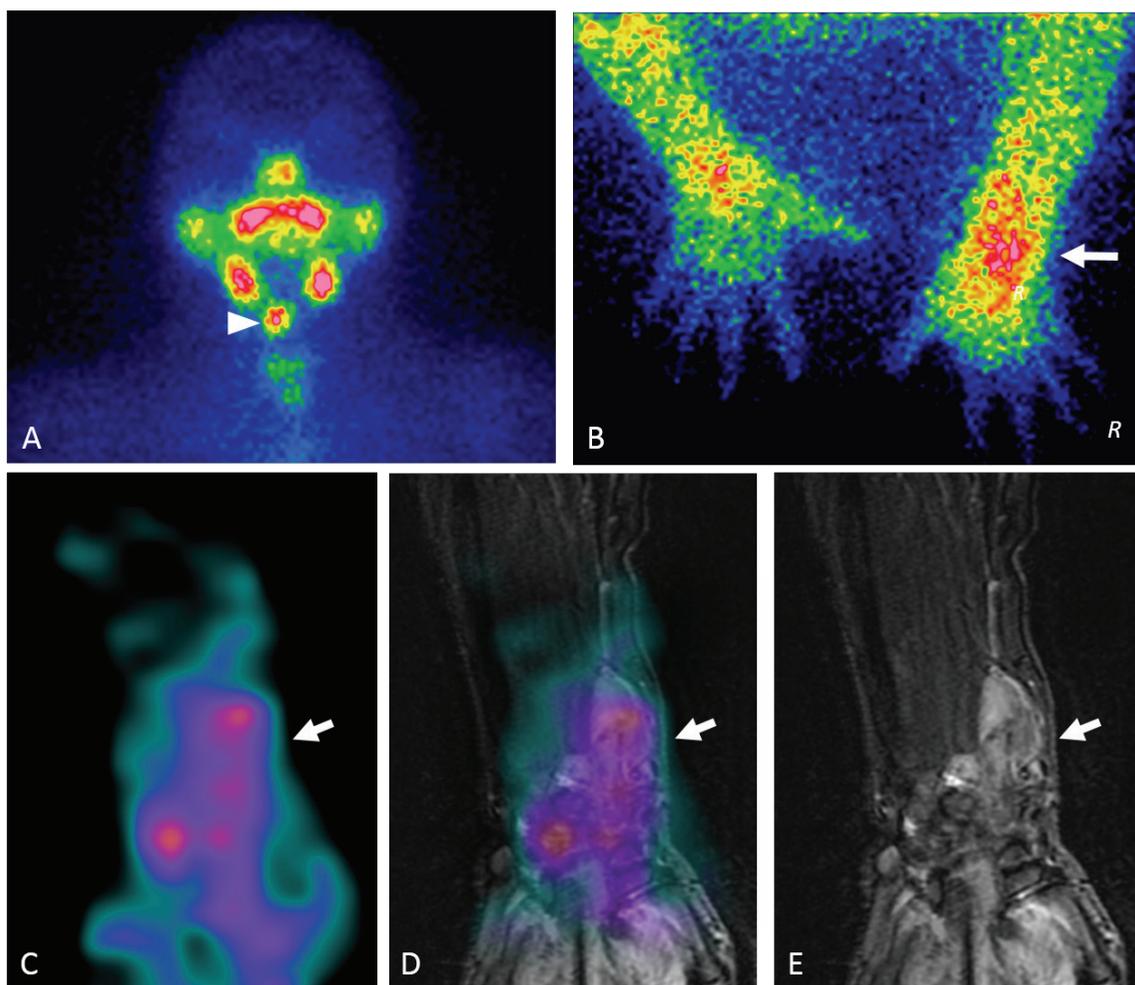
**Anahtar kelimeler:** Tendon kılıfının dev hücreli tümörü, tiroid neoplazmaları, sintigrafisi, manyetik rezonans görüntüleme

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**Figure 1.** Seventy seven year-old woman with a history of wide tenosynovial giant cell tumor (TGCT) of the right wrist and hand that had been resected thirteen years ago, who did not follow the surveillance for this tumour. Following the diagnosis of a well-differentiated follicular thyroid carcinoma, the patient underwent total thyroidectomy and subsequent Iodine-131 [<sup>131</sup>I] remnant ablation, receiving an activity of 3.7 GBq. Five days after [<sup>131</sup>I] administration, the post-therapy scan showed mild uptake in the thyroid remnant and a more intense focus of uptake, probably secondary to a thyroglossal duct remnant (A, arrowhead). To assess the possibility of a TGCT relapse, we did a palmar planar image of both forearms, wrists and hands (B), which showed mildly increased uptake in the distal third of the radial forearm, wrist and metacarpal spaces (B, arrow) a more evident in the single photon emission computed tomography (SPECT) images (C, arrow). Subsequent magnetic resonance imaging (MRI) and fused SPECT/MRI images (D: Coronal SPECT-MRI; E: Coronal MRI) revealed increased signal on fat suppression with short-time inversion recovery (STIR) coronal sequence concordant with the increased uptake in SPECT (arrows in D and E). The histological examination was consistent with the TGCT. The patient did not present with any clinical side effect secondary to radioiodine treatment, or any clinical sign or symptom in the right upper limb after one-year follow-up. TGCT is an orphan, mono-articular and potentially locally aggressive disease that occurs in a localized form, which involves a discrete section of the synovium, or in a diffuse form, which involves the entire synovium (1,2,3). The diffuse type has high recurrence rates and poor functional outcomes (1,2,4). TGCT is characterized by hypervascular neoplastic proliferation of the synovium with deposition of macrophages, multinucleated giant cells and hemosiderin (3). The proposed reasons for iodine increased uptake in non-thyroid tumors are an expression of sodium iodide symporter, augmented vascularity and enhanced capillary permeability, which can be caused by inflammation secondary to the tumor (5,6,7). MRI is the most distinctive imaging technique in diagnosing and treating TGCT (1,2,3,8). It reflects the existence of hemosiderin-laden tissue that applies a paramagnetic effect decreasing T1 and T2 relaxation times, leading to low to intermediate signal intensity in T1 and T2 weighted spin-echo sequences. On STIR sequences, the effect is overstated because of increased magnetic susceptibility deriving in areas of very high signal intensity (3,8). The main treatment modality is resection for naïve and relapsed TGCT. Radiation therapy and targeted therapies, mainly with monoclonal antibody inhibiting colony-stimulating factor 1 receptor (pexidartinib) are promising, and both should be considered especially in case of relapse (1,2,3,4,8). However, in our patient's case, watchful waiting was finally decided, mostly because of age, relative good mobility, and the stability of the tumor on serial MRI. A considerable number of cases of unexpected radioiodine uptake have been reported and some of which were in the limbs (6). To our knowledge, this report is the first in the literature of a TGCT visualized in the post-therapy radioiodine scan.

## Ethics

**Informed Consent:** Consent form was filled out by the patient.

**Peer-review:** Externally peer-reviewed.

## Authorship Contributions

Concept: F.M.C.S., L.G.R.R., R.D.B., Design: F.M.C.S., L.G.R.R., X.L.B.C., R.D.B., Data Collection or Processing: F.M.C.S., L.G.R.R., R.D.B., Literature Search: F.M.C.S., L.G.R.R., X.L.B.C., R.D.B., Writing: F.M.C.S., L.G.R.R., X.L.B.C., M.M.L., P.G., A.C.V., R.R.L., R.D.B.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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