

## Teaching case: breast neuroma

Published on 22.03.2021

**DOI:** 10.35100/eurorad/case.17171

**ISSN:** 1563-4086

**Section:** Breast imaging

**Area of Interest:** Breast

**Procedure:** Biopsy

**Imaging Technique:** Ultrasound

**Imaging Technique:** Ultrasound-Colour Doppler

**Special Focus:** Biopsy Case Type: Clinical Cases

**Authors:** Sofie Dekeyzer<sup>1</sup>, Vera Schelfhout<sup>2</sup>, Filip Vanhoenacker<sup>1,3,4</sup>

**Patient:** 81 years, male

### Clinical History:

An 81-year-old female with a history of left mastectomy 4 years prior for invasive breast cancer (IDA G2pT1cN1a (se); ER 8/8, PR 6/8, ISH-; KI67 intermediate). Aromatase inhibitor therapy was initiated. Because of comorbidity and cardiomyopathy, radiotherapy was not administered, despite sentinel node metastasis.

Previous follow-up imaging was normal.

Clinical examination was unremarkable.

### Imaging Findings:

Sonographic examination of the mastectomy scar showed a small oval hypo-echoic subcutaneous nodule of 6 mm with sharp delineation, smooth regular margins and no intralesional vascularisation on power-Doppler ultrasound.

The lesion was parallel oriented to the chest wall. (Fig.1)

Ultrasound-guided biopsy (Fig.2) and subsequent histopathological investigation

( Fig.3a and 3b) revealed a neuroma.

### Discussion:

A traumatic neuroma is a rare benign lesion occurring in a mastectomy scar after breast surgery.

It consists of a benign proliferative lesion as a response to nerve injury, caused by direct or indirect trauma, surgery or chronic inflammation. On immunohistochemical examination, the lesion is composed of bundles of nerve cells with degenerative changes surrounded by fibro-adipose tissue. The nerve cells are positive for S100 protein and have a typically brown colour on immunohistochemistry [1,2]

The lack of pankeratin and KI 67 expression on immunohistochemical examination excludes proliferation activity and malignancies such as carcinoma or sarcoma. [1,2,3]

Usually, the patient is asymptomatic and the lesion is often detected at the mastectomy scar on follow-up ultrasound after mastectomy.[1,2,3]

On ultrasound, the lesion often shows a benign morphology, with smooth regular margins, sharp delineation and homogenous hypoechoic appearance. Color Doppler images show no internal vascularity[3]

Magnetic Resonance Imaging (MRI) was not performed in this patient, but MRI findings are often non-specific: on dynamic T1 contrast-enhanced MRI sequences the nodule shows most commonly a type I or type II kinetic curve, although a type II curve with wash-out has also been described. According to the literature, a neuroma has often an isointense signal on T1-weighted images and a high signal intensity on T2-weighted images.[4,5]

Although the lesion has a nonaggressive morphology and may mimic a benign lesion such as an oil cyst, any lesion appearing in a postoperative scar should be interpreted with caution. Therefore malignancy should be excluded by means of biopsy and subsequent immunohistological examination.

Treatment or surgery for a neuroma is not required and watchful waiting and annual follow-up ultrasound is recommended.[1]

### **Take-home messages**

A neuroma is a rare benign lesion, seen in patients with a previous mastectomy.

The clues to the correct diagnosis are the awareness of the clinical history, the presence of a well-defined hypoechoic nodule at the mastectomy scar on ultrasound

and the presence of nerve fibres on immunohistochemistry.

**Differential Diagnosis List:** Neuroma, Local tumour recurrence, Metastatic lymph node, Granular cell tumour, Neuroma, Oil cyst

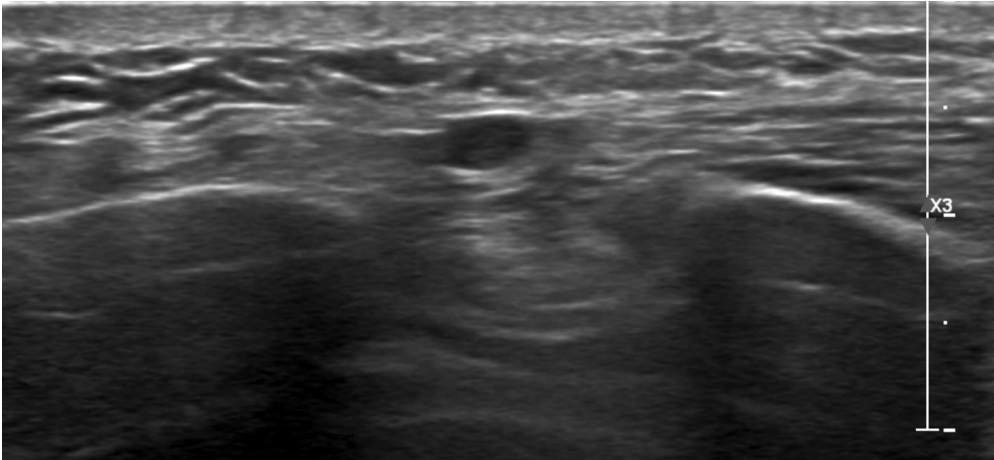
**Final Diagnosis:** Neuroma

### **References:**

- Chen W, Zhang H, Huang J, Li Y, Zhang Z, Peng Y (2019) Traumatic neuroma in mastectomy scar: two case reports and review of literature. *Medicine (Baltimore)* 98:e15142. doi: 10.1097/MD (PMID:[30985684](#))
- Li Q, Gao EL, Yang YL, Hu HY, Hu XQ (2012) Traumatic neuroma in a patient with breast cancer after mastectomy: a case report and review of literature. *World J Surg Oncol* 10:35. doi: 10.1186/1477-7819-10-35 (PMID:[22330690](#))
- Sung HS, Kim YS (2017) Ultrasonographic features of traumatic neuromas in breast cancer patients after mastectomy. *Ultrasonography* 36:33–8 (PMID: [27599891](#))
- Kim SM, Park JM (2004) Normal and abnormal US findings at the mastectomy site. *Radiographics* 24:357–65 (PMID: [15026586](#))
- AlSharif S, Ferré R, Omeroglu A, El Khoury M, Mesurolle B (2016) Imaging features associated with posttraumatic breast neuromas. *Am J Roentgenol* 206:660-5 (PMID: [26901025](#))

# Figure 1

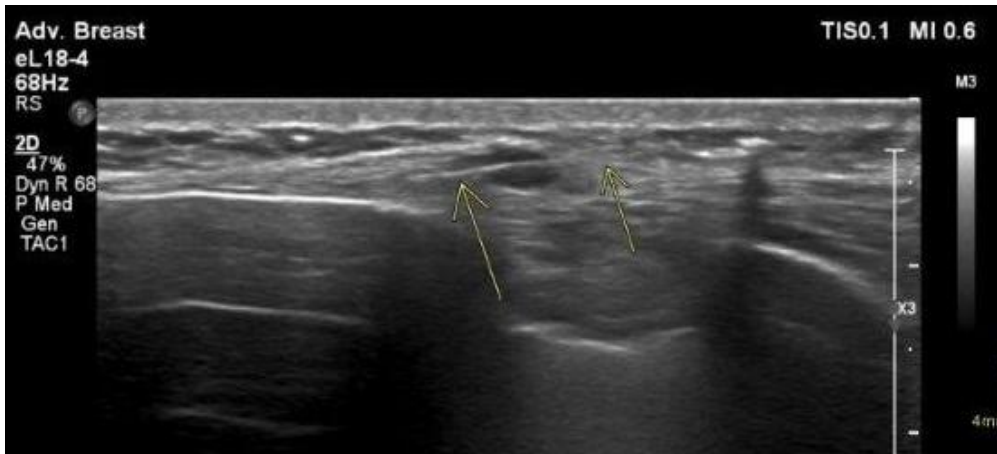
a



**Description:** Ultrasound shows an oval well-circumscribed hypo-echoic lesion measuring 6 mm, without Color-Doppler internal vascularity. **Origin:** © AZ Sint-Maarten, Mechelen, Belgium

## Figure 2

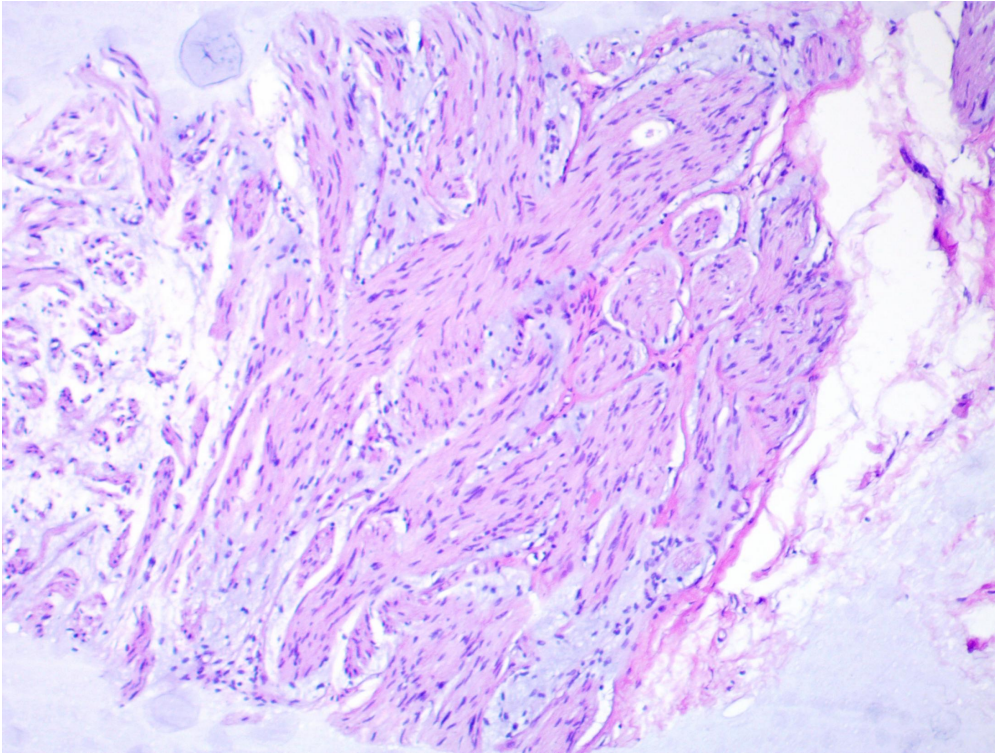
a



**Description:** Ultrasound-guided core biopsy with 14-gauge needle. **Origin:** © AZ Sint-Maarten, Mechelen, Belgium

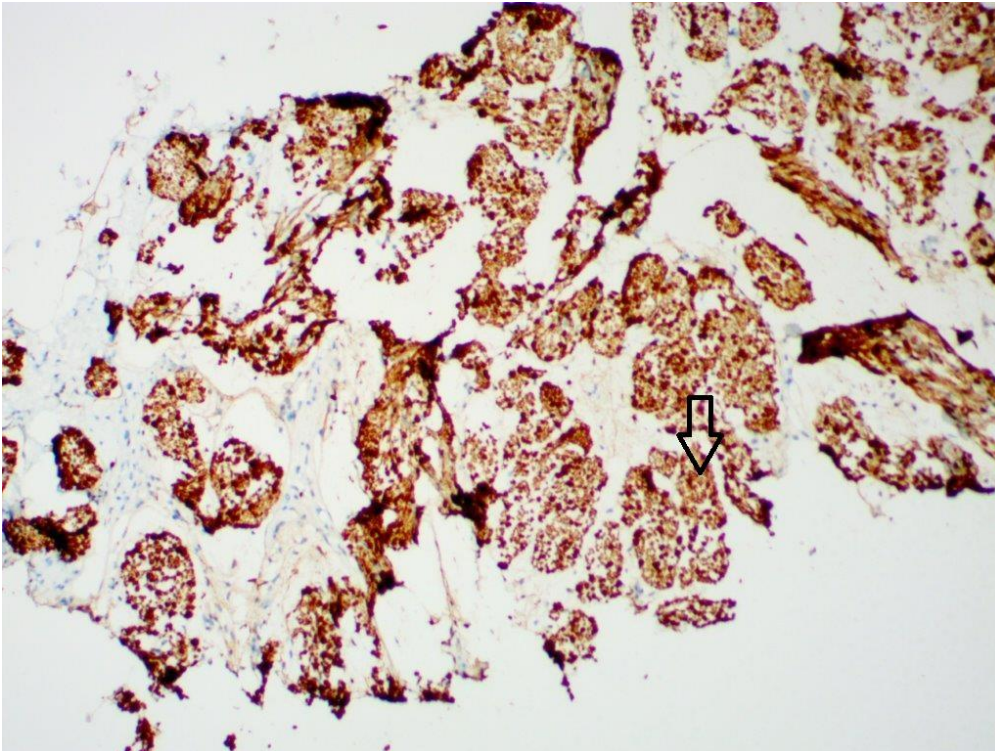
## Figure 3

a



**Description:** Histological findings. (a)The nodule consisted of disordered proliferative nerve fiber bundles (pink, arrow) with fibroblasts (purple) surrounded by fibro-adipose tissue seen with Hematoxylin and Eosin, x20. (b)The nerve cells are positive for S100 protein (brown color, arrow), x10. **Origin:** © AZ Sint-Maarten, Mechelen, Belgium

**b**



**Description:** Histological findings. (a)The nodule consisted of disordered proliferative nerve fiber bundles (pink, arrow) with fibroblasts (purple) surrounded by fibro-adipose tissue seen with Hematoxylin and Eosin, x20. (b)The nerve cells are positive for S100 protein (brown color, arrow), x10. **Origin:** © AZ Sint-Maarten, Mechelen, Belgium