



A case of axillary traumatic neuroma mimicking local recurrence following cancer surgery and a review of the literature

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Abstract

Traumatic neuroma (TN) is a non-neoplastic proliferative response developing against neuronal injury. Its pathogenesis is unknown: While its overall incidence is low, the incidence of traumatic neuroma development following mastectomy is even lower. Thirty-eight post-mastectomy traumatic neuromas in 30 patients were reported in the literature. Only two of these were in the axillary region, whereas the others had originated from the mastectomy scar tissue. Even though the ultrasonographic examination reveals the features of a benign mass, performing a histopathological examination is a must for definitive diagnosis of the mass and exclusion of local recurrence, mainly when it has developed following cancer surgery. Here, we aimed to discuss in the light of the literature a patient who had undergone mastectomy and axillary dissection with the diagnosis of invasive ductal carcinoma eight years ago and underwent recurrent axillary dissection with the preliminary diagnosis of axillary metastasis.

Keywords: traumatic neuroma, local recurrence, mastectomy, breast cancer

1. Introduction

Traumatic neuroma (TN) is a rare non-neoplastic reactive proliferation (1). It is manifested as a palpable mass following neural injury or surgery. It is more common after lower extremity amputations and head & neck surgery. Traumatic neuroma within the mastectomy scar tissue is quite rare, and only two cases with post-axillary-dissection traumatic neuroma were reported in the literature (2, 3). Its differential diagnosis with a local recurrence should be made in patients who underwent cancer surgery. Here, we aimed to discuss in the light of the literature a patient who had undergone mastectomy and axillary dissection with the diagnosis of invasive ductal carcinoma eight years ago and underwent recurrent axillary dissection with the preliminary diagnosis of axillary metastasis.

2. Case Report

A 46-year-old female patient expressed in her routine follow-up examination that she had pain in her left axillary region for the last six months. She had undergone left mastectomy and axillary dissection with the diagnosis of invasive ductal carcinoma six years ago. A tender nodular lesion of approximately 6 mm in diameter was palpated on the left axillary bed on physical examination. The ultrasonographic examination revealed a round, subcutaneously located, hypoechoic 7.5x6 mm-sized solid lesion with a peripheral thin halo, showing partial internal blood supply with Doppler. Histopathological examination was recommended due to its interpretation as suspicious for metastatic lymph node or fat

necrosis. Positron emission tomography-computed tomography (PET-CT) examination revealed an approximately eight mm-sized probably metastatic lymphadenopathy with fluorodeoxyglucose (FDG) involvement, which had not been present in her previous follow-up examinations, and thus, clinical follow-up was suggested. Axillary dissection was performed to safely exclude a probability of axillary metastasis, considering the patient's malignancy history.

On macroscopic examination, the cross-sectional surface of the fragmental fat tissue, approximately 6x4x3 cm in size, was generally fibrotic, and a nodular structure was present in a six mm-sized area. A structure compatible with a lymph node could not be dissected. All the described, white-colored areas were taken into consideration. The histopathological examination revealed a proliferation characterized by randomly arranged nerve fascicles within a significantly collagenized stroma and organized as well-circumscribed nodules (Fig.1a and 1b). The nerve fascicles were stained positive for S100 (Figure 1c). Giant cells with phagocytosed suture material secondary to the previous operation were observed within the surrounding adipose tissue. The patient was diagnosed with a traumatic neuroma. Constant was obtained from the patient. The rate of post-mastectomy local recurrence is 5.5% to 8.95%. Because the rate of benign lesions developing in the scar region is less than malign lesions, the first thing that should be considered in a newly

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developing lesion is a local recurrence. Recurrent lesions are seen as hypochoic lesions on USG (7). Even though most traumatic neuromas are well-circumscribed and avascular on

USG, some of them may be vaguely circumscribed and vascular, mimicking local recurrence (7, 9).

Table 1. Clinical information and imaging features of traumatic breast neuromas published in the literature

Reference	Patients	ge-sex	Neuromas n	Neuroma Size m	Location	Time after surgery (yr)	Palpable	Pain/Tenderness	USG	Mamografi	Pet	Treatment
Wenyi et al. (2019)	2	58F	3	6,4,10	Subcutaneous (2) Pectoralis muscle layer (1)	4,7	Yes (2) No (1)	No	Ovall, well circumscribed, homogeneously hypochoic	N/A	N/A	Surgical excision(1),ultrasound guided core biopsy(1)
Nikolas S.Salemis (2018)	1	65F	1	N/A	Subcutaneous mastectomy scar area	2	No	Yes	Unremarkable	Clustered microcalcification	N/A	Surgical excision
Jason D.Mesinger et al (2017)	1	4F	2	6,16	Subcutaneous axilla	N/A	N/A	N/A	Oval, parallel, circumscribed,hypochoic	N/A	N/A	Ultrasound guided core biopsy
Kimberley Fitzparick et al. (2017)	1	73F	1	7	Lateral aspect	16	No	No	Oval, parallel,circumscribed, hypochoic	Small, oval, circumscribed, equal density	N/A	Ultrasound core nidle biopsy
Quanli et al. (2012)	1	45F	1	5	Subcutaneous next to mastectomy scar	2	Yes	N/A	Well circumscribed,echo-heterogeneous	N/A	N/A	Surgical excision
Our case	1	46F	1	8mm	Aksilla	6	Yes	Yes	N/A	N/A	FDG uptake present	Surgical excision

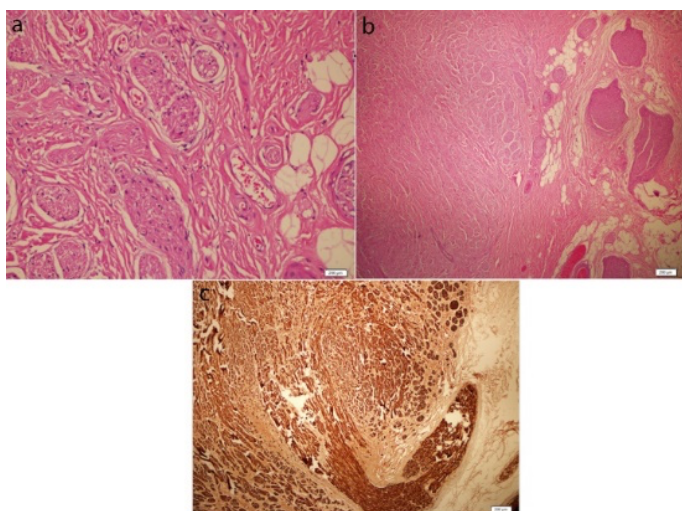


Fig. 1. Sections representing traumatic neuroma and immunohistochemistry study. Peripheral nerve sections of different diameters are observed in connective tissue containing collagenized intermediate tissue and a small amount of adipose tissue, H&E x100 (a) Proliferating nerve sections without a distinct organization are observed H&Ex200 (b) Peripheral nerves are stained dark brown with S100 immunohistochemical, staining x 200 (c)

3. Discussion

The traumatic neuroma is the reactive non-neoplastic proliferation of the nerve's severed proximal end due to failed repair in nerve injuries (1). It is frequently encountered in lower extremity amputations and head & neck surgery (1, 2,3,4) and may mimic local recurrence due to its clinical and radiological features (5,6). There are mostly post-amputation TN cases in the literature (7). Thirty-eight traumatic neuromas in 30 cases were reported in the literature. Some of

these cases and the clinical and radiological features of our patient were presented in Table 1. The youngest patient was 31 years old, the oldest 78 years old, and all were female. TN developed post-surgery 1.9 years at the earliest and 22 years at the latest. The smallest was 0.4 cm, whereas the largest 1.6 cm (7). While some of the patients described pain-sensitivity (8), some others were asymptomatic (6, 7). If the patient has no complaint, surgical treatment is not necessary. Physical therapy, local injections, long-acting local anesthetics, steroids, or surgery can be used in patients with pain complaints. Most lesions are viewed as oval, well-circumscribed, avascular, and hypochoic masses on ultrasonographic examination. In our case, partial vascularization was present. Mammography, MRI, and PET CT do not show any specific features (7). It may present findings such as clustered microcalcification (8,9) and well-circumscribed oval density (6). PET-CT did not reveal any FDG uptake in three cases (7). In our case, FDG uptake was present.

In conclusion, USG, mammography, and PET CT are commonly used for follow-up of patients in whom a mastectomy/lumpectomy procedure has been performed. A timely diagnosis of local recurrence has a positive contribution to the patient's outcome. Even though recurrence is considered the first possibility in nodular lesions detected within scar tissue of mastectomy and axillary dissection, traumatic neuroma should be kept in mind in patients describing neuropathic pain and sensitivity.

Conflict of interest

None to declare.

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None to declare.

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