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Case Report

Diffusion Mr; A New Diagnostic Tool for Elastofibroma Dorsi

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Abstract

Elastofibroma dorsi is a benign lesion commonly presents as a palpabl enlarging mass at the inferior pole of the scapula. Clinical presentation and radiological characteristics are often enough to suggest the accurate diagnosis. Increased awareness of the characteristic appearance and location of these benign lesions will increase radiologic diagnosis, decrease the need for biopsy.

Ten patients were admitted with complaint of asymptomatic or painful subcutaneous masses localized at subscapulary region. Thorax computed tomography, magnetic resonance imaging (MRI) and a new feasible technique in differantial diagnosis with malignancy and probable diagnosis of elastofibroma dorsi; diffusion-weighted MRI were used for diagnosis.

Surgery was applied to all patients, frozen-section biopsies of the lesions at peroperative period and final pathologies were all benign. Totally resection of whole lesions as en-bloc excision without any rest were performed at all patients. Postoperative and follow-up periods were uneventful.

Diffusion MRI can take an important role in the future and save the patients especially medically poor ones, from the potential risks of surgery. Necessary further examinations for probable bilaterally lesions will save the patient from the risk of a second operation.

Keywords: Chest wall, imaging, tumour.

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Elastofibroma dorsi (ED) is a rare, slow-growing, non-casulated, benign soft tissue tumour of the chest wall arising from connective tissue forming collagen bundles. It is most commonly located in the periscapular region, beneath ther homboid major and latissimus dorsi muscles especially in elderly women. It can be bilaterally, but not always in synchronous localizations. It may be densely adherent to surrounding muscle and bone, and therefore the suspicion for malignancy is often raised. In addition to careful clinical investigation, radiology is the method of choice leading to a presumptive diagnosis.[1] Besides a few sporadic cases the only literature reporting a large series is including 170 cases.[2] Ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), have all been used to characterize elastofibroma. Surgical extirpation is usually curative.[2, 3] We report 10 cases of ED treated with surgery and want to point out a new promising diagnostic technique to differentiate benign lesions without surgery.

Patient and Methods

Eight female and two male patients, ages between 44-72 years-old (median: 54) were admitted to clinic with complaint of asymptomatic or painful subcutaneous masses localized subscapular. Lesions were palpated at right side in 3 patients, left in 2 and bilaterally in 5. Thorax CT and/or MR

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(Fig. 1) performed to all. Five patients were detected with MR (Fig. 2a, b) and one with also diffusion (Fig. 2c). All revealed heterogeneous soft tissue masses under latissimus dorsi muscle. Diffusion MRI which can be a new diagnostic technique for ED was used to differantiate malign lesion in one case. Diffusion-weighted sequence showed a 6x2.5cm mass with intense restriction at right between the scapula and the chest wall. The mass is characterized by a moderately heterogenous hipointense signal in T2. The fusion of the diffusion-weighted sequence in T2 demonstrates more clearly the intense restriction in the mass.

Surgical resection was performed by a posterolaterally incision directly over the mass at prone position with arms at abduction. Transverse incision and dissection parallel to

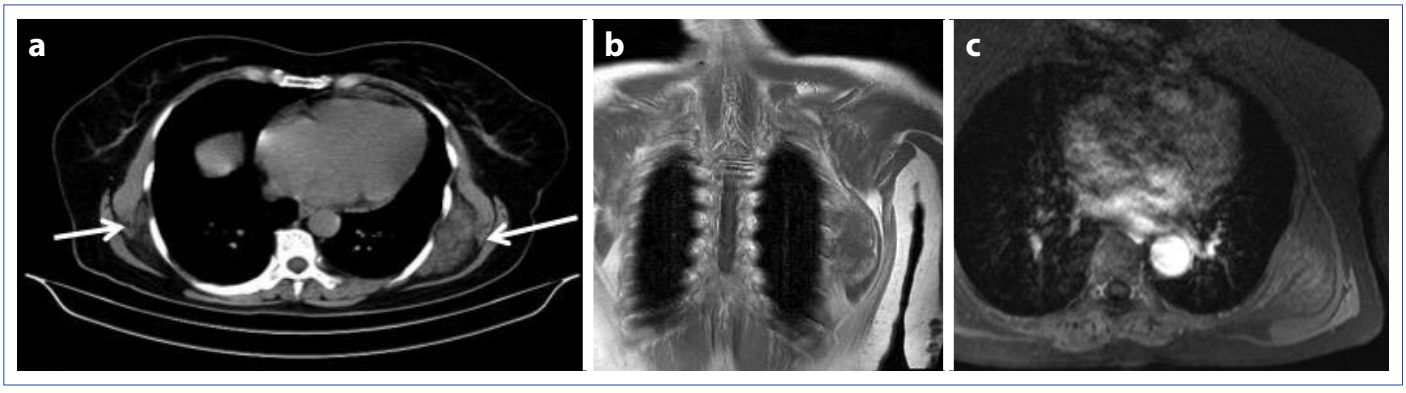

Figure 1. Thorax CT **(a)** and MRI **(b, c)** sections of left sided soft tissue mass under latissimus dorsi.

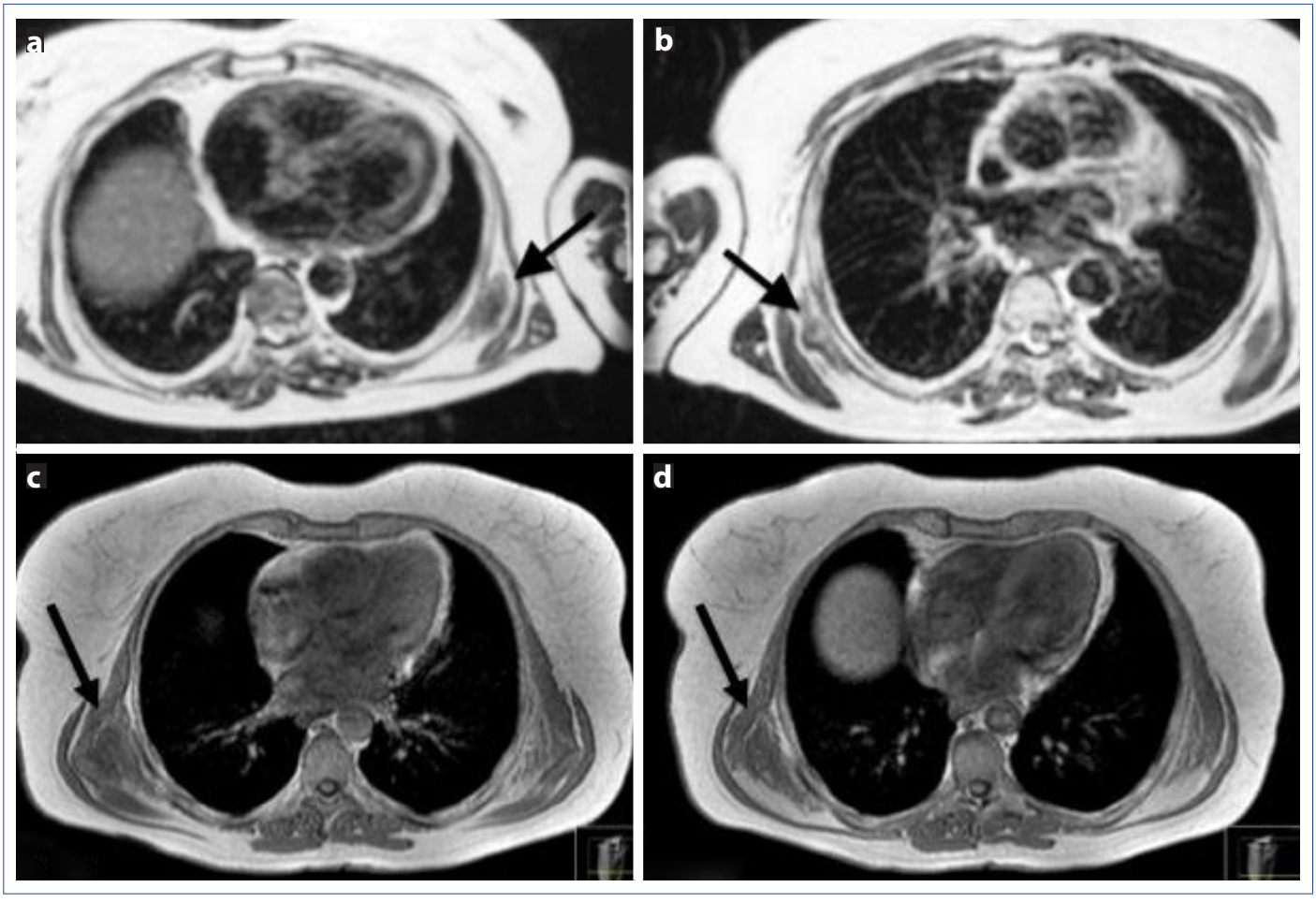

Figure 2. Thorax MRI **(a, b)** of bilaterally heterogeneous soft tissue masses and diffusion MR **(c)** of another case with right sided mass under latissimus dorsi.

latissimus dorsi muscle made the tumour visible then totally resection was performed. Although varying in size, all of the lesions had the same anatomical placement and were lying under the scapula, adherent to the ribs. They were all mobile and like tempered rubber with palpation (Fig. 3). Resections of bilaterally lesions in 5 patients were performed during the same session. Pathologies were benign ED (Fig. 4). Postoperative period was uneventful, patients were pain free with a completely normal shoulder range of motion. Median follow up was 32 (12-80) months and there was no recurrence.

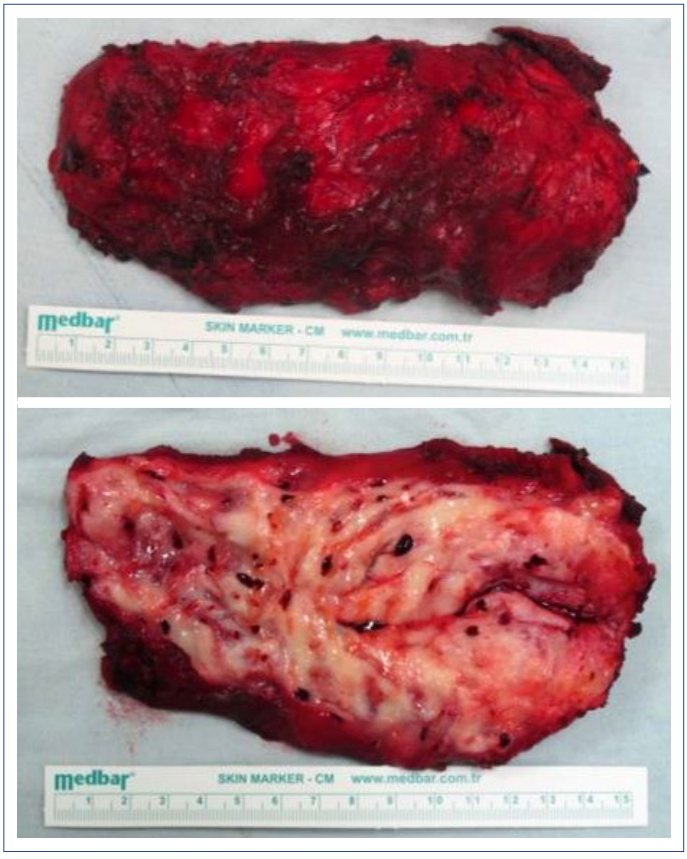

Figure 3. Resected and incised specimen just after surgery.

Discussion

Elastofibroma dorsi is a subcutaneous, benign nodular lesion, firstly reported by Jarvi in 1961.[4] Although more than 90% of the cases are localized to the lower subscapular region, deep in the rhomboid and latissimus dorsi muscles, unusual locations like deltoid muscle, ischial tuberosity, olecranon, thoracic wall, axilla, foot, stomach, rectum, spinal canal, mediastinum, and cornea were noted in the literature.[5] Our findings support previous reports suggesting that a preoperative diagnosis is not necessary in most cases since the lesion can be confidently diagnosed by CT or MRI, when interpreted in the light of appropriate clinical findings. Surgical excision in symptomatic patients, is preferred. Elastofibroma is not a true neoplastic process. Although it was suggested that repetitive microtrauma - may be because of the working status - by friction between the lower part of the scapula and the thoracic wall or hereditary enzyme defects may cause the reactive hyperproliferation of fibroelastic tissue, the pathogenesis of the lesion still remains unclear and thought to be multifactorial.[3, 6] Microtrauma theory was not suitable for our patients. They were housewomen, teacher, security, and retired people. Elastofibromas are often seen in elderly women and mostly asymptomatic besides the appearance of a subcu-

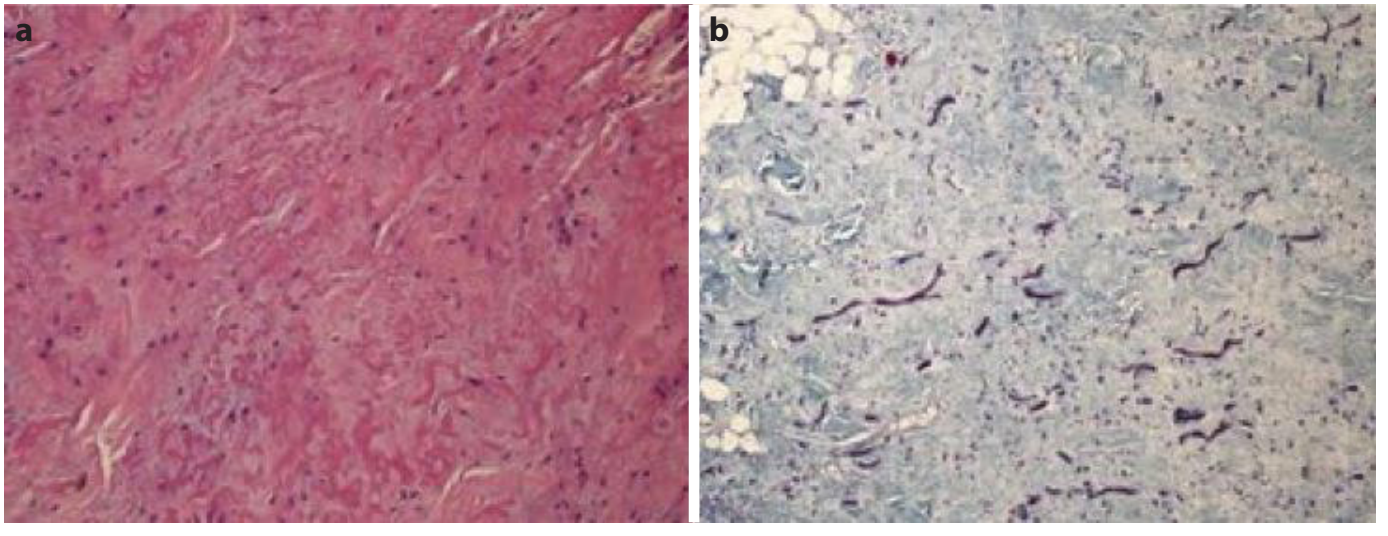

Figure 4. Dark colored elastic fibers between hyalinised collagen tissue; seen heterogenous at horisontally sections and circular at transverse sections with Haematoxylin-Eosining (x100) **(a)**. Darker elastic fibers detected between fat tissues, inside heterogenous dense collagen connective tissue with Mason trichrome (x100) **(b)**.

taneous bump. In other cases, there may be moderate pain, and limited functions in hard efforts, or even in daily performance.[5, 7] Compatible with the literatures our patients were mostly female and older than 45 years of age. All our lesions were anatomically located at back of shoulder adjacent to scapula. When it is detected at one side, necessary further investigations should be performed by considering bilaterally lesions. Thus, patients should be protected from the risk of a second operation, by operating on both sides in the same session. Our 5 patients had bilaterally lesions and this was compatible with the reports of possibility in 10-66% of all cases.[8] Radiology takes an important role in ED. The scapula may appear raised on a chest x-ray and the scapulo-thoracic space may appear enlarged. An opacity between the two scapulas may be identified, without bone lesions or associative calcifications. Thorax CT shows the typical characteristics of an uncapsulated lentiform shaped tumour with hypodense strands which appears isodense to muscular structures.[2] All our CT or MRI scans were similar to those typical characteristics with indicating isodense, soft tissue masses under muscularis latissimus dorsi. Diffusion-weighted magnetic resonance imaging (DWI) is one such technique, which explores the translational mobility of water molecules, thereby shedding light on the microstructural features of the tissue of interest, whether they facilitate, or restrict such freedom of proton mobility. DWI has been primarily used in neuroradiology, but applications in other body areas have also been increasing. Fast imaging techniques such as echo-planar imaging (EPI) facilitate the use of DWI in thoracic imaging by decreasing the deleterious effects of motion.[9, 10] This may be a new diagnostic tool for also elastofibroma with more spesific findings by providing functioanl information about the diffusivity of water molecules and can highligt high cellularity lesions throughout the body.[11] Like in one of our patients diffusion MRI revealed benign characteristics of the soft tissue mass. Elastofibromas display typical diagnostic histologic, cytologic, and electron microscopic features. Heterogenous, thick eosinophilic elastic bands of fat, muscle and collagen tissue can be detected.[12] As in our surgical specimens, H-E and mason tricrom staining can be strongly positive. In more recent articles, some characteristic imaging results may help in differentiating malignant from benign masses noninvasively.[13, 14]

Conclusion

Patients with ED are often asymptomatic, an enlarging palpable mass is the common physical sign. When a mass lesion observed in the subscapular regions of elderly patients, ED; a rare soft tissue tumour, should be considered. Surgery is essential in symptomatic patients and although tumours of ED are benign, histological study is advisable to establish a differential diagnosis with malignant neoplastic processes. Complete surgical excision is the treatment of choice. So it is important to say with certainity that benign. Diffusion MRI can be a new tool to define the diagnosis as benign and prevent surgery in small, asymptomatic lesions or in patients with poor conditions for the operation without suspicion of malignancy.

Also when it is detected unilaterally, bilaterally cases must be kept in mind and further examinations should be performed by considering that it may be bilaterally. In these cases, if surgery is needed patients should be avoided from the risk of a second operation by operating on both sides in the same session.

Disclosures

Peer-review: Externally peer-reviewed.

Conflict of Interest: None declared.

Informed consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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