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ORIGINAL ARTICLE

Elastofibroma Dorsi: experience of a single center

Elastofibroma dorsi: experiencia en un centro

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Abstract

Objective: *Elastofibroma dorsi (ED) is a rare benign tumor located in the subscapular region. The aim of this study was to evaluate our clinical findings, surgical approach, and management of ED patients based on single-center data with the relevant literature.* **Methodology:** *A retrospective evaluation was conducted on 20 patients who were operated on for ED.* **Results:** *Of the 16 (80%) female patients and 4 (20%) male patients, the main complaint was swelling (80%), and 10 cases (50%) had unilateral involvement. All patients were operated on using standard surgical procedures. Despite a long follow-up period (6-53 months, mean of 26.6 months), no recurrences were observed. Two patients (10%) required simple needle aspiration due to post-operative seroma, and one patient, due to infection, required evacuation (5%).* **Conclusion:** *Although rare, ED should not be overlooked in patients with swelling in the back region. Our data suggests that surgery can be safely performed in such patients after a clinical and radiological diagnosis of ED has been established.*

Keywords: *Elastofibroma dorsi. Clinical presentation. Diagnosis. Follow-up. Treatment.*

Resumen

Objetivo: *Evaluar los hallazgos clínicos, el enfoque quirúrgico y el manejo de los pacientes con urgencias a partir de los datos de un solo centro y la literatura relevante.* **Método:** *Se realizó una evaluación retrospectiva de 20 pacientes que fueron operados de ED.* **Resultados:** *En los 16 (80%), pacientes del sexo femenino y cuatro (20%) del sexo masculino, la queja principal fue la tumefacción (80%) y 10 casos (50%) tuvieron afectación unilateral. Todos los pacientes fueron operados utilizando procedimientos quirúrgicos estándar. Con un largo periodo de seguimiento (6-53 meses, media de 26.6 meses), no se observaron recurrencias. Dos pacientes (10%) requirieron aspiración con aguja simple por seroma posoperatorio y un paciente (5%) requirió evacuación por infección.* **Conclusiones:** *Aunque es raro, el ED no debe pasarse por alto en pacientes con hinchazón en la región de la espalda. Nuestros datos sugieren que la cirugía se puede realizar de manera segura en estos pacientes después de haber establecido el diagnóstico clínico y radiológico de ED.*

Palabras clave: *Elastofibroma dorsi. Presentación clínica. Diagnóstico. Seguimiento. Tratamiento.*

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Introduction

Elastofibroma dorsi (ED) is a benign lesion of unknown pathogenesis that is most often located in the subscapular or pericapsular region but has also been reported in rare regions such as the deltoid, ischial, olecranon, gluteus maximus muscle, stomach, mediastinum, omentum, and tricuspid valve[1,2]. Although ED is usually slow-growing and asymptomatic, the diagnosis of ED is important because it may mimic malignant tumors of the thoracic wall[1]. Some patients may experience back pain and limited shoulder mobility[1,3]. ED etiology is thought to include tissue responses to trauma or vascular damage, ultimately leading to the formation of a mass characterized by infiltration of adipocytes and deposition of abnormal collagen and elastic fibers.

The common approach for ED is surgical excision when the tumor is < 5 cm or symptomatic[4,5]. However, due to the lack of a comprehensive series examining the diagnosis and treatment of ED, opinions vary on how to manage the disease. In this study, we present and discuss the clinical, radiological, and surgical findings of ED patients who underwent surgery at our clinic in light of current literature.

Material and methods

The study was approved by the Clinical Studies Ethics Committee of Tokat Gaziosmanpasa University Faculty of Medicine (Approval No. 22-KAEK-097), and all steps were carried out in compliance with the Declaration of Helsinki. Twenty patients who were diagnosed with ED at Tokat State Hospital and underwent surgery at our clinic between 2007 and 2022 were included in the study. Data from these patients were retrospectively evaluated in relation to demographic information, profession, complaints, presence of local recurrences, and follow-up and post-operative observations.

Patients with signs of swelling in the subscapular region underwent a physical examination followed by a magnetic resonance image (MRI) to evaluate the tumor's position and its relationship with surrounding tissue (Fig. 1A and B). No diagnostic biopsies were performed before surgery. Any post-operative recurrences or other anomalies were evaluated using ultrasonography.

All patients underwent marginal resections of their tumors under general anesthesia. In the prone position, an incision was made along the border of the scapula, and the mass was meticulously resected from the thoracic cage and subscapular area by blunt and sharp dissection. Bilateral cases were operated on in a single session. Immobilization of the shoulder, hemovac drainage, and garments (elastic bondage) were used in all patients. Hemovac drains were removed on the 3rd post-operative day.

For the evaluation of pre-operative and post-operative pain, the Numerical Rating Scale (NRS) was used. NRS is an assessment in which patients rate their pain on a scale of 0 to 10, with 0 being no pain and 10 being the worst pain. This scale is applied by the patient verbally or in writing.

Results

Sixteen of the study patients (80%) were female, and 4 (20%) were male. Swelling and back pain were the main complaints in 80% of patients, and a visual mass was observed in all patients in the subscapular region during anterior flexion of the arm (Fig. 1B). Limited shoulder mobility was observed in twelve patients (30%), and four (20%) were asymptomatic. An opening snap was observed in two patients (10%). The mean age was 61 years (with an overall age range of 41-74). Bilateral tumors were present in ten patients (50%), and unilateral lesions were more common on the right side (60%) (Table 1). Excisional surgery was performed on all patients, and tumors were completely removed (Figs. 2A and B).

Although the follow-up period was lengthy (6-53 months, mean of 26.6 months), no recurrences were observed. Two (10%) patients required simple needle aspiration of post-operative seroma, and 1 patient (5%) needed evacuation due to infection.

Discussion

ED was first described in 1959 by Jarvi and Saxen and has since been reported in 1961[6,7]. ED is a rare and benign soft-tissue tumor that typically occurs between the latissimus dorsi and serratus anterior muscle groups in the subscapular region. The tumor is firmly attached to the thoracic wall between the sixth rib and the eighth[8]. It is controversial whether ED is a true tumor, and its etiology is considered to be multifactorial. Recent studies suggest that the incidence of ED may be higher in individuals who engage in

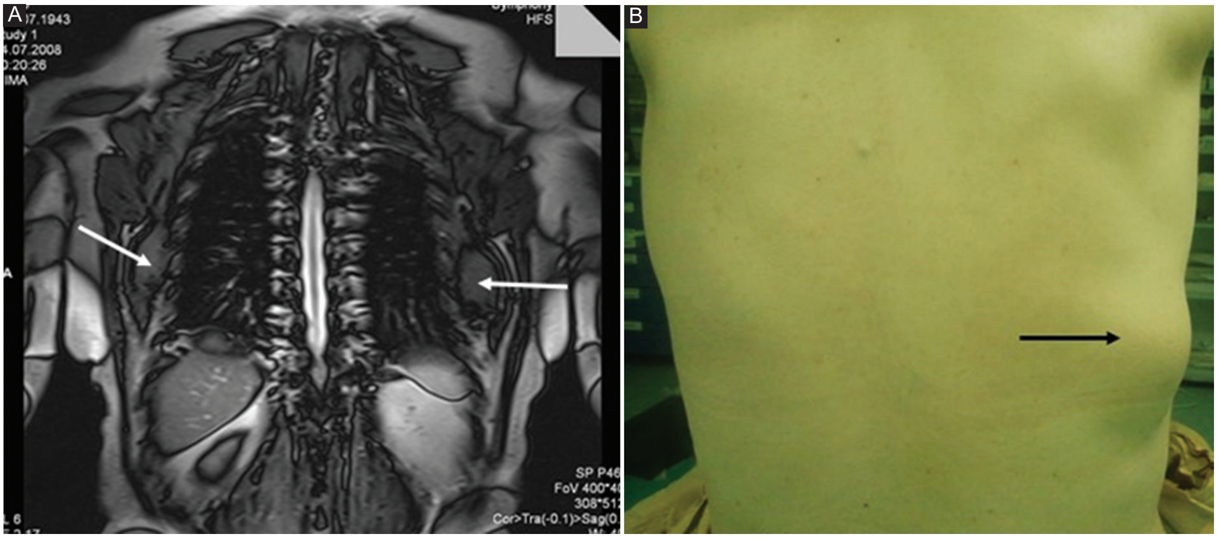

Figure 1. A: *T1-weighted coronal magnetic resonance image of ED in a case with bilateral involvement (white arrows).* **B:** *view of ED in the lower corner of the scapula (clearly visual with anterior flexion of arm black arrow).*

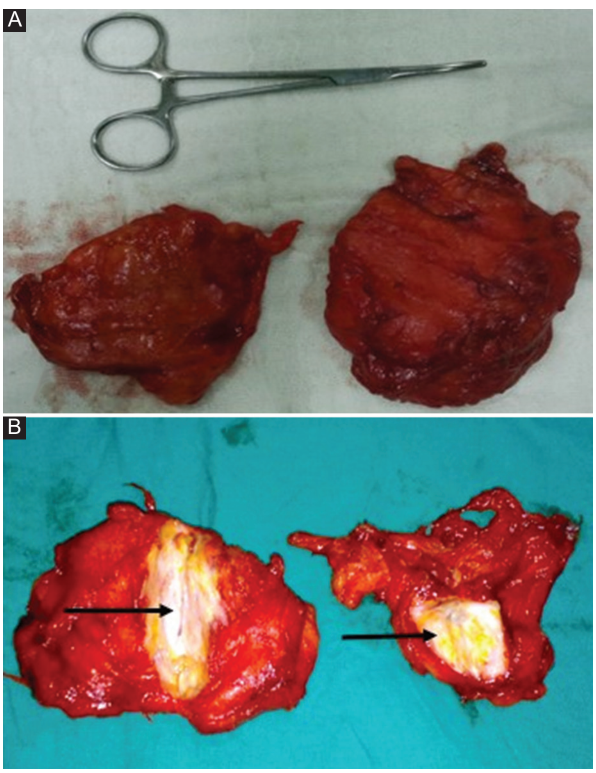

Figure 2. A: *macroscopic view of bilaterally excised ED tumor; rubbery solid mass with undefined borders.* **B:** *cut surface of tumor; white-gray rubbery tissue containing yellow fatty islands (black arrows).*

physical work that involves trauma to this area, but it has been reported in such regions as mediastinum and omentum, seemingly contradicting this theory[1]. Genetic anomalies, including mutations in the Xq12-q22 region and chromosome 19, may play a role in the development of ED, as some have suggested[9]. As was true in our study, ED is known to be more common in females, especially those over 55 years of age[10]. In elderly females, reactive fibromatosis and secondary degeneration of elastic fibers due to vascular insufficiency have been proposed as another theory for etiology, but it has also been reported in young individuals[11].

ED is typically asymptomatic. However, when symptoms do occur, patients can experience swelling and pain in the subscapular region and limited shoulder mobility, such as friction, stiffness, and an opening snap. Due to the diverse symptomatology of ED, as a differential diagnosis, cervical lesions and rotator cuff tears must be kept in mind[12]. In our study, visual mass from anterior flexion of the arm and back pain in the subscapular region were the main symptoms. The suggested association between ED and physical activity, along with more frequent involvement of the dominant limb, may explain the observation that ED arises more often on the right side. ED has commonly been reported as unilateral. However, half of the patients in our study had bilateral involvement, and there have also been reports of bilateral involvement up to 66% due to the asynchronous development of tumors[13].

The diagnosis of ED is usually based on clinical examination and radiological imaging. The mass can be more easily palpated when the arm is flexed anteriorly[13,14]. MRI is the preferred imaging modality as it can accurately determine the size of the tumor, its borders, and its relationship with the surrounding tissue[8,15]. In a typical ED MRI, the interposed areas of decreased signal intensity also appear as low signal intensity on T2-weighted sequences[16].

Table 1. Clinic details of 20 patients operated on for elastofibroma dorsi

AGE	G	BP	Swelling	OP	LSM	Site	Profession	NRS (Pre-post)
74	F	+	+	+	+	B	Housewife	6-2
41	M	+	-	-	-	R-U	Policeman	4-0
68	F	+	+	-	+	B	Housewife	5-1
60	F	+	+	-	+	B	Housewife	7-2
50	F	+	+	-	-	B	Lawyer	4-0
54	F	+	+	-	+	R-U	Tailer	5-1
60	M	+	+	-	+	B	Officer	4-0
62	F	+	+	-	+	B	Housewife	7-2
59	M	-	+	-	-	L-U	Officer	0-0
66	F	+	+	-	+	R-U	Engineer	4-0
64	F	+	+	+	+	L-U	Teacher	5-1
66	F	-	+	-	-	B	Housewife	0-0
64	F	+	-	-	+	R-U	Housewife	7-2
66	F	-	-	-	-	R-U	Housewife	0-0
57	M	+	+	-	+	L-U	Barber	4-0
55	F	-	-	-	-	L-U	Nurse	0-0
64	F	+	+	-	-	B	Housewife	8-1
64	F	+	+	-	+	B	Housewife	6-1
60	F	+	+	-	-	R-U	Housewife	7-1
66	F	+	+	-	+	B	Housewife	8-2

BP: back pain; OP: opening snap; LSM: limited shoulder mobility; R: right; L: left; B: bilateral; U: unilateral; NRS: numerical rating scale (preoperative-post-operative).

The data regarding the value of diagnostic biopsies are not conclusive. Although some authors suggest that a fine needle or open biopsy may be useful in supporting the diagnosis, others argue that a basic clinical examination and radiological findings are sufficient[13]. In our study, patients were diagnosed based on physical examinations and typical MRI results, with no indication of suspected malignancy. Therefore, no biopsies were performed, as a complete resection of the tumors was proposed as the treatment approach. Some authors have also suggested surgery in asymptomatic patients to confirm the diagnosis or address possible malignant pathology[17,18]. All our asymptomatic patients (20%) refused follow-up and preferred surgery because of fear of cancer and cosmetic reasons. NRS is reliable in evaluating pain improvements in elderly patients[19].

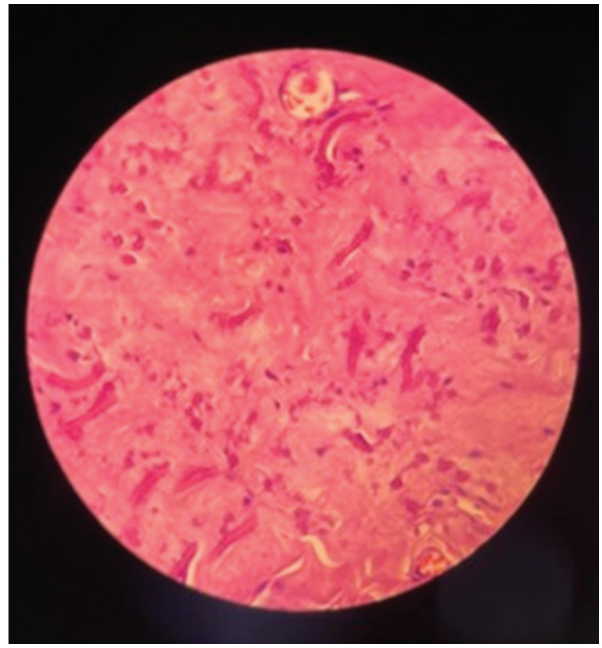

Figure 3. *Collegenius tissue with fragmented elastic fibers (H&E 100).*

The macroscopic appearance of tumors is typically poorly defined as a non-encapsulated mass with a rubbery consistency and a cut-surface containing white and yellow areas due to fibrous and fatty tissue. Histological examination has demonstrated it to be a collagenous tissue mixed with eosinophilic fragmented elastic fibers (Fig. 3).

Seromas and hematomas are the most common post-operative problems after ED resection, as they result from the dead space introduced during surgery and damaged adherent surrounding tissue while separating from the mass[5]. Measures such as bleeding control, placement of appropriate drains without suturing the skin, shoulder immobilization, and bandaging after the procedure can minimize these problems. Our post-operative complication rates were 10% for seroma and 5% for infection, which is in accordance with statistics from the literature[1]. In different series, seroma has been reported at 10-40%, which is probably due to tumor size leading to dead space[5,8]. Some authors suggest talc insufflation when drainage is over 50 cc. and persistence after 3 days[5]. Overall, our findings suggest that surgical resection is a safe and appropriate therapeutic approach for ED following a diagnosis based on physical examination and MRI.

Conclusion

ED is a subscapular pathology that pre-dominantly affects elderly females. While the diagnosis can be made based on clinical and radiological data, a biopsy or surgical excision may be advised if there is a suspicion of malignancy. Our findings suggest that marginal resection of the tumor is a safe treatment option with minimal morbidity that may be best suited for symptomatic patients or when malignancy is suspected.

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Conflicts of interest

The authors declare no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained approval from the Ethics Committee for the analysis and publication of routinely acquired clinical data, and informed consent was not required for this retrospective observational study.

Use of artificial intelligence for generating text. The authors declare that they haven't used generative artificial intelligence, specifically, in the writing of this manuscript and/or in the creation of images, graphics, tables, or their corresponding captions.

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