Clinical case
Calcified glomus tumor of the shoulder. A case report
Tumeur glomique calcifiée de l’épaule. Cas clinique

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Abstract
The authors report a case of calcified glomus tumor of the shoulder in a 54-year-old woman. The nonspecific clinical findings and the noncharacteristic imaging results made diagnosis of this tumor impossible before surgery. The diagnosis was confirmed by a biopsy. The outcome after surgical resection was excellent.

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Résumé
Les auteurs rapportent un cas de tumeur glomique calcifiée de l’épaule chez une femme de 54 ans. Le diagnostic a été fait par une biopsie mais n’a pas été suspecté en préopératoire, ni par l’examen clinique, ni par le bilan d’imagerie. La résection chirurgicale a permis d’obtenir un excellent résultat.

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1. Introduction
Glomus tumors are benign vascular neoplasms arising from arteriovenous shunts called glomus bodies, which take part in thermal regulation [1]. They are characterized by a triad consisting of paroxysmal pain, pressure tenderness and cold hypersensitivity [2]. Although they are found mainly in the distal phalanx, especially in the fingernail, they can occur anywhere in the body [1,2]. Generally, when the location is other than the fingers, delayed and misdiagnoses are reported [3–6].

We report a case of glomus tumor in the deltoid that was not suspected before surgery.

2. Case report
A 54-year-old, right-handed woman presented with chronic right shoulder pain of 30 years duration. The pain had gradual increased in severity and become incapacitating during the last two years, making her unable to pursue her usual daily activities. She attributed the onset of the symptoms to a minor injury at home. She complained of constant pain at rest, worse at night. Pain exacerbation occurred on minimal direct touch on the area. The pain score was nine out of 10 on the visual analogue scale.

During the previous two years, the patient had consulted five different practitioners before her visit to our hospital. Nonsteroidal anti-inflammatory drugs produced slight relief, but physiotherapy did not improve the pain.

On physical examination, she had severe tenderness on palpation of the distal insertion of the deltoid although there was no visible abnormality, no swelling and no local heat.
Shoulder active and passive ranges of motion were severely restricted due to pain. The active range of motion was 35° flexion, 30° abduction and 25° external rotations. The passive range of motion was 80° flexion, 70° abduction and 40° external rotations. Plain radiographs and computerized tomography (CT) scan showed an area of calcification on the lateral side of the humeral shaft at the level of the deltoid tuberosity (Fig. 1). Neither bone erosion nor periosteal reactions were found on the radiographs and the CT scan. Calcifying tendonitis was proposed as the probable diagnosis; however, due to the disproportion between the incapacitating pain, the findings on the physical examination and radiographs images, it was decided to proceed to magnetic resonance imaging (MRI) and scintigraphy. MRI showed a calcification in the distal insertion of the deltoid muscle without any cortical bone abnormality in the humeral shaft. T2-weighted images and images after injection of gadolinium showed an enhancement around the calcification with well-defined margins (Fig. 2). There was no lesional uptake on the scintigraphy. Again, a variant of calcifying tendonitis was proposed as a diagnosis, and a neoplastic lesion was not suspected. A local cortisone injection was performed which provided no relief.

In the light of persistence of the symptoms, it was decided to perform a surgical resection of the calcification and detachment of the deltoid insertion based on the diagnosis previously proposed.

Surgical exploration revealed a calcified mass in the distal deltoid insertion which was completely excised with the surrounding tissue. Microscopic examination showed a partially calcified glomus tumor (Fig. 3). Round and polygonal cells without atypical mitosis forming collars around capillary vessels were seen (Fig. 4). These features characterize the glomus tumor called glomangioma.

Resection of the tumor was followed by immediate pain relief; pain was scored four out of 10 on the visual analogue scale the following day. Six months after surgery, the patient remains symptoms-free and she has recovered normal daily activities with her right arm.

Fig. 1. CT scan showing the calcification with no bone cortical erosion.

Fig. 2. Frontal T1 MR image shows the calcification at the distal insertion of the deltoid muscle.

Fig. 3. Pathology section showing focal fibrosis with calcification (Haematoxylin-eosin stain, original magnification × 20).
3. Discussion

Glomus tumors are benign neoplasms originating from the neuromyoarterial glomus bodies that are usually located in the dermis [1]. The normal glomus body is an arteriovenous shunt that serves a thermoregulatory function because of its control on skin blood flow [1].

Although these tumors can be found everywhere in the body, 75% of these lesions are located in the hand, mainly in the fingertip [7]. Grossly, the lesions are usually small (less than 1 cm); however, tumors up to 4 cm have been reported [5]. Microscopic examination of the tumors revealed clusters of small cells with uniform round to ovoid nuclei and eosinophilic cytoplasm, forming several layers in approximation to the interwoven capillary network [1].

Clinically, glomus tumors usually present with paroxysmal pain elicited by tactile stimulation or minor trauma [2,5,7]. Pain exacerbations may occur secondary to temperature change, mainly cold exposure [2]. Although the classic diagnostic triad consists of paroxysmal pain, pressure tenderness and cold hypersensitivity, the diagnosis of the glomus tumors is frequently delayed due to its nonspecific presentation [3–8]. Several clinical tests have been developed to aid the diagnosis of these lesions such as the Love test (point tenderness) [2,9], the Posner test (provocation of pain by cold) [9,10], transillumination [11] and the Hildreth test (ischemia test) [9]; however, their application is principally restricted to fingers [2,9,11].

When glomus tumors arise at unusual anatomic sites, a high index of suspicion is necessary to avoid delayed diagnosis of the lesions. To our knowledge, six previous cases of glomus tumor have been reported in the shoulder girdle [3–6,12,13]. The authors of these reports showed a delay in the diagnosis ranging from 10 to 20 years and a history of several treatments before the tumor was excised. Neuroma, rotator cuff lesion, cyst, fat necrosis and dermoid inclusion have been proposed in these cases as a preoperative diagnosis.

In five of the six previously reported cases, a localized tenderness to palpation (Love test) was present; however, sensitivity to cold exposure (Posner test) was reported only in one patient [3–5,12,13].

Although the diagnosis of glomus tumor is primarily clinical, several imaging techniques may be helpful such as plain radiography, ultrasonography, scintigraphy and MRI. Radiographs can show bone erosion principally in the distal phalanx, but diagnostic sensitivity is low [2]. Although Solivetti et al. [13] have reported the ultrasound pattern of glomus tumor of the shoulder, González-Llanos et al. [14] stated that ultrasonography gives nonspecific images. Nevertheless, only superficial lesions are available for this examination. Van Geertruyden et al. have reported that scintigraphy was positive in all their cases of glomus tumor of the hand, however sensitivity was low as well as nonspecific in the shoulder [2]. This test was positive only in one of the previously reported cases, probably due to its size [5]. With respect to MRI, Al-Qattan et al. have reported that it has a high sensitivity but it is nonspecific [11] and Hou et al. have stated that MRI appearance of a high signal central dot surrounded by a zone of less signal intensity is characteristic of glomus tumors [15]. However, not all tumors show this nidus appearance and most glomus tumors are seen as a dark lesion on T1 and as a bright, high signal intensity lesion on T2-weighted MRI [10,11].

To our knowledge, we report the first calcified glomus tumor of the shoulder. The uncharacteristic appearance of the lesion made us unable to suspect a glomus tumor as a differential diagnosis. However, in a retrospective analysis of the present case, we found that the history of the pain, the localized tenderness and the MRI showing high signal on T2-weighted and enhancement after gadolinium injection around the calcification should have been critical for diagnostic suspicion.

Because early diagnosis can lead to surgical resection and curative treatment, we recommend considering glomus tumor as a possible differential diagnosis when a calcified mass is found in a patient with chronic shoulder pain.

References


Fig. 4. Perivascular monomorphic glomus cells without atypical mitosis. (Haematoxylin and eosin stain, original magnification × 40).


