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Case Report

A glomus tumor in the pectoralis major muscle causing shoulder pain: a case report

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Abstract: Glomus tumors are benign neoplasms that arise from the modified smooth muscle cells of the glomus body. The tumors occur most frequently on the extremities, mainly the subungual areas of the digits. Extra-digital glomus tumors, particularly those in skeletal muscle, are rare. We present a case of intramuscular glomus tumor arising in the pectoralis major muscle of a 43-year-old Asian woman with a history of painful nodular lesion of shoulder. The patient underwent excision of the mass. She remained uneventful, with complete resolution of the symptoms.

Keywords: Glomus tumor, intramuscular, pectoralis major muscle

Introduction

Glomus tumors are relatively rare, accounting for 1.6% of all soft tissue tumors [1]. They arise from the modified smooth muscle cells of the glomus body, a neuromyoarterial structure found within the reticular dermis that functions as a specialized form of arteriovenous anastomosis [2]. Glomic units are highly concentrated in the digits, palms, and soles of the feet.

Glomus tumors are usually solitary, deep blue-to-purple, and accompanied by the classic triad of pain, cold sensitivity, and point tenderness [3]. The tumors occur most frequently on the extremities, mainly the subungual areas of the digits [4]. Extra-digital glomus tumors are rare, particularly those that occur in skeletal muscle. A few cases of intramuscular glomus tumor arising from skeletal muscle (including the deltoid [5, 6], trapezius [7], triceps [8], quadriceps [9], thigh [10, 11], and gastrocnemius [12]) have been reported; however, there are no reports of an intramuscular glomus tumor in the pectoralis major muscle presenting as shoulder pain. Here, we report a case of intramuscular glomus tumor arising in the pectoralis major muscle in an adult female.

Case report

A 43-year-old Asian woman was referred to the Department of Orthopedic Surgery with a 3 month history of a painful nodular lesion on the right shoulder. Physical examination revealed a deep-seated tenderness of the right shoulder. Contrast magnetic resonance imaging (MRI) revealed a well-defined hyperintense mass (3×1.5 cm) on T2-weighted images sited within the right pectoralis major muscle (**Figure 1**). Mass excision was performed following a clinical diagnosis of hemangioma.

Gross examination revealed a well-circumscribed whitish nodule (2.5×1.6 cm). Microscopic examination showed an encapsulated tumor comprising a uniform population of cells with an eosinophilic cytoplasm, central distinct round nuclei, and prominent cytoplasmic borders (**Figure 2A**). Normal mitoses were seen only rarely (one mitotic figure per 50 high-power fields). These cells were closely associated with small vascular channels. There was no necrosis, vascular invasion, or other features suggestive of malignant behavior. Immunohistochemical staining was positive for smooth muscle actin and vimentin, and negative for CD31, chromogranin, and S-100 (**Figure 2B**). There-

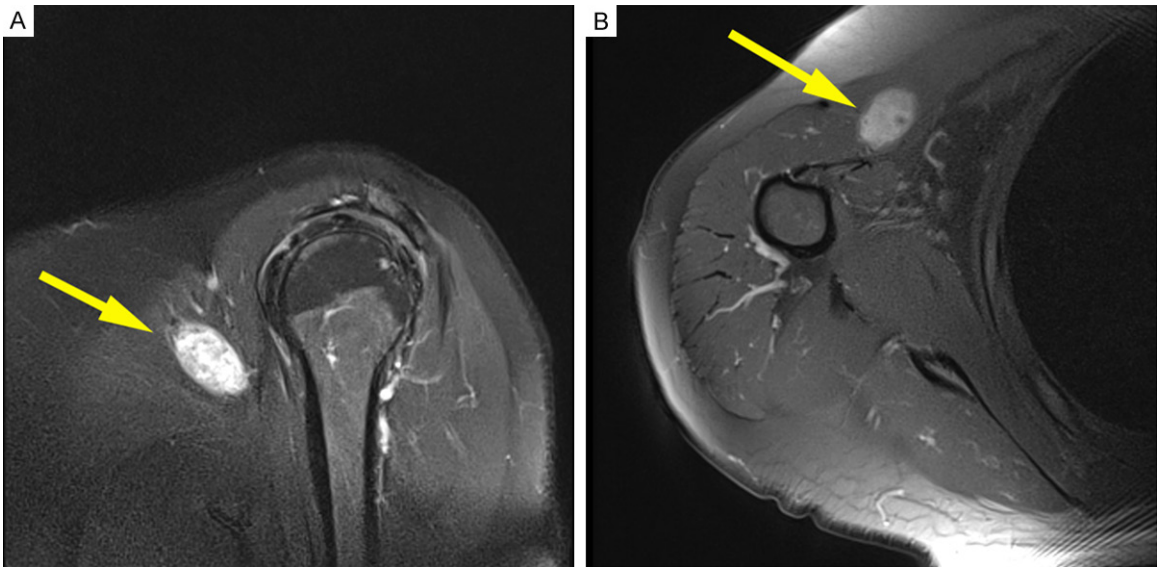

Figure 1. Magnetic resonance imaging revealed a well-defined hyperintense mass (arrow) on T2-weighted image in coronal (A) and transverse (B) planes.

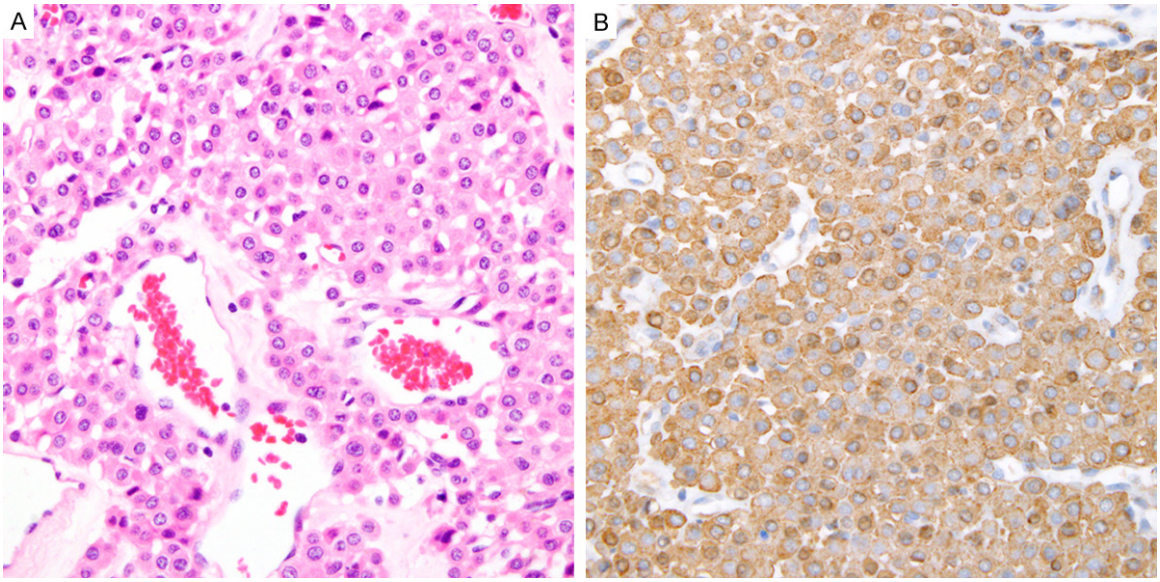

Figure 2. A. The tumor was composed of uniform population of cells with an eosinophilic cytoplasm, central distinct round nuclei (magnification, ×400). B. The immunostaining for smooth muscle was diffuse positive (magnification, ×400).

fore, a diagnosis of solid-type glomus tumor was made. The postoperative period was uneventful, with complete resolution of the patient's symptoms.

Discussion

Glomus tumors commonly develop in the subungual region of the hand, although they may occur anywhere on the body. Extra-digital glomus tumors, particularly those in skeletal muscle, are rare and so present a diagnostic dilemma. To date, tumors have been reported in the deltoid [5, 6], trapezius [7], triceps [8], quadriceps [9], thigh [10, 11], and gastrocnemius [12] muscles. The small size and deep location make localization difficult and may delay diagnosis. In the current case, the mass was pal-

pable and tender despite the intramuscular location; therefore, early diagnosis was made by MRI.

Lee *et al*. [3] demonstrated that extradigital glomus tumors are more common in males, whereas digital tumors are more frequent in females. Schiefer *et al*. [4] examined 56 patients with extra-digital glomus tumors and found that 48 presented with pain and localized tenderness, but only one presented with cold intolerance.

Accurate diagnosis followed by complete excision is curative for patients with a solitary lesion, although recurrence rates range from 12-33% [13]. Malignant glomus tumors are rare. Folpe *et al*. [14] proposed the following classification criteria for malignant glomus tumors: i) deep location and >2 cm in size; ii) presence of atypical mitotic figures; or iii) moderate to high nuclear grade and ≥ five mitotic figures per 50 high-power fields.

Here, we present a rare case of an intramuscular glomus tumor arising in the pectoralis major muscle. Thus, physicians should be aware of clinical presentations typical of glomus tumor in any area of the body when a patient presents with a painful subdermal mass. This case is unique in terms of the location and adds to the body of literature on glomus tumors.

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Disclosure of conflict of interest

None.

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References

[1] Shugart RR, Soule EH and Johnson EW Jr. Glomus tumor. Surg Gynecol Obstet 1963; 117: 334-340.

[2] Takei TR and Nalebuff EA. Extradigital glomus tumour. J Hand Surg Br 1995; 20: 409-412.

[3] Lee DW, Yang JH, Chang S, Won CH, Lee MW, Choi JH and Moon KC. Clinical and pathological characteristics of extradigital and digital glomus tumours: a retrospective comparative study. J Eur Acad Dermatol Venereol 2011; 25: 1392-1397.

[4] Schiefer TK, Parker WL, Anakwenze OA, Amadio PC, Inwards CY and Spinner RJ. Extradigital glomus tumors: a 20-year experience. Mayo Clin Proc 2006; 81: 1337-1344.

[5] Karakurum G, Tutar E, Pirbudak L and Mizrak A. Glomus tumour of the deltoid muscle. A case report. Acta Orthop Belg 2009; 75: 681-683.

[6] Beytemur O, Adanir O, Tetikkurt US and Gulec MA. Glomus tumor located in deltoid muscle. Acta Orthop Traumatol Turc 2016; 50: 242-244.

[7] McIntyre JD, Lucas J, Smith MA and McKee H. Intramuscular glomus tumour: sixth reported case. Histopathology 1999; 35: 281-282.

[8] King S, Hunt J, Glenny A and Lewell K. A mitotically active, intramuscular glomus tumour with no recurrence at 12 months. Pathology 2009; 41: 709-710.

[9] Negri G, Schulte M and Mohr W. Glomus tumor with diffuse infiltration of the quadriceps muscle: a case report. Hum Pathol 1997; 28: 750-752.

[10] Amillo S, Arriola FJ and Munoz G. Extradigital glomus tumour causing thigh pain: a case report. J Bone Joint Surg Br 1997; 79: 104-106.

[11] Rodriguez JM, Idoate MA and Pardo-Mindan FJ. The role of mast cells in glomus tumours: report of a case of an intramuscular glomus tumour with a prominent mastocytic component. Histopathology 2003; 42: 307-308.

[12] Chiang ER and Chen TH. Multiple glomus tumors in gastrocnemius muscle: a case report. Arch Orthop Trauma Surg 2008; 128: 29-31.

[13] Rettig AC and Strickland JW. Glomus tumor of the digits. J Hand Surg Am 1977; 2: 261-265.

[14] Folpe AL, Fanburg-Smith JC, Miettinen M and Weiss SW. Atypical and malignant glomus tumors: analysis of 52 cases, with a proposal for the reclassification of glomus tumors. Am J Surg Pathol 2001; 25: 1-12.