Glomus tumour of the elbow: a case of mistaken identity

Nasri Zreik*, Christopher Talbot* & Chris Peach†

*Royal Bolton Hospital NHS Foundation Trust, Bolton, Lancashire, UK †University Hospital of South Manchester NHS Foundation Trust, Manchester, UK

ABSTRACT

Received

Received 2 November 2013;
accepted 10 January 2014

Keywords

Glomus tumour, elbow, misdiagnosis

Conflicts of interest

None declared

Correspondence

Christopher Talbot, Royal Bolton Hospital
NHS Foundation Trust, Minerva Road,
Farnworth, Bolton, Lancashire BL4 0JR, UK.
Tel.: +44 1204390738.
Fax: +44 1204390344.
E-mail: christaltalbot@doctors.org.uk

DOI: 10.1177/1758573214522019

Glomus tumours are small vascular tumours that are usually benign and rarely occur. However, atypical locations of these tumours can lead to misdiagnosis, particularly where the lesion is rarely reported. We report a case of glomus tumour located on the posterior aspect of the elbow, which was mistaken for, and treated as the commonly diagnosed, olecranon bursitis for several years. With worsening symptoms, mainly pain, pinpoint tenderness and hypersensitivity, the patient was referred for a further opinion, and the lesion was diagnosed as a glomus tumour following complete excision under anaesthesia. This present case highlights the importance in considering this rare entity in the differential diagnosis of posterior elbow swelling and pain. Furthermore, this report provides a review of the literature and identifies the need for early specialist referral to confirm diagnosis, alleviate patient symptoms and improve function.

INTRODUCTION

Glomus tumours are a benign neoplasm of the glomus apparatus. The glomus apparatus is an encapsulated arteriovenous anastomosis located in the dermis involved in thermoregulation. It is present throughout the body; however, they are most concentrated around the digits, in particular the subungual regions; hence, this being one of the more common sites for the development of glomus tumours. They are considered to represent less than 2% of primary hand tumours [1]. Extradigital tumours have been reported throughout the body. We describe a case of misdiagnosed extradigital glomus tumour around the elbow and provide a review of the literature.

CASE REPORT

A 90-year-old male presented to the elective orthopaedic clinic following referral by his general practitioner (GP) complaining of a painful nodular swelling located on the posterior medial aspect of his right elbow. The overlying skin appeared bruised. For over 15 years, the patient complained of a fluctuant swelling over the posterior aspect of his right elbow. His main concern was pain. If he brushed past someone in public or rested his arm on a chair, the pain experienced was locally intense at the elbow. This was treated as olecranon bursitis and, over the years, it flared up and became more painful. As a result, the patient underwent several aspirations and local steroid injections by his GP. Initially, these injections alleviated some of his pain; however, over time, his swelling became

more painful, mainly to touch and resistant to injections. Moreover, the swelling had increased in size slightly, and had begun to affect his daily activities as a result of hypersensitivity of the area.

The patient suffered with type II diet controlled diabetes but was otherwise fit and well. He denied any form of trauma to the elbow, stiffness, weakness or paraesthesia, and was constitutionally well.

Examination revealed a localized, fluctuant 2 × 2 cm well defined, nodular lesion in the vicinity of the tip of the olecranon, extremely tender to palpation, and mobile with the skin. There was neither any evidence of erythema, nor cellulitis, and the swelling did not transilluminate. Percussion over the nodule did not elicit a positive Tinel's sign.

Plain radiographs (Fig. 1) demonstrated a localized soft tissue swelling superficial to the olecranon tip, with no evidence of degenerative joint disease, calcification or any periosteal reaction. There was no evidence of a fractured olecranon traction spur or radiopaque foreign body. In view of this, the decision was taken to excise the lesion under local anaesthesia. No further imaging was performed. A tourniquet was used and an elliptical skin incision was made over the lesion and excision of the lesion was performed. The lesion was well demarcated, encapsulated with no joint involvement and no adherence to the ulna nerve, which made dissection more straightforward. The lesion, bluish purple in colour, was completely removed and the wound closed primarily.

Following excision, histological analysis (Fig. 2) confirmed the diagnosis of a glomus tumour. There has been no

Fig. 1 Lateral plain radiograph of the elbow demonstrating a soft tissue swelling posterior to the tip of the olecranon.

Fig. 2 Smooth muscle actin (SMA) immunostain slide ($\times 100$ magnification) demonstrating diffuse and intense SMA immunopositivity in glomus cells (indicated by an arrow).

recurrence and no further symptoms for 12 months following excision. Both informed consent and permission was obtained from the patient.

DISCUSSION

The glomus apparatus is a small periphery thermoregulatory and baroregulatory receptor found in the stratum reticularis of dermis [2]. It consists of an encapsulated arteriovenous anastomosis that also contains glomus cells and the intraglomerular reticulum [3]. Glomus apparatus is encountered throughout the body, although are most concentrated in the digits, particularly in the subungual regions [2,4]. Immunologically, glomus tumours are immunopositive for smooth muscle actin (Fig. 2), calponin, vimentin and h-caldesmon [5].

Glomus tumours were first described clinically by Wood in 1812 as 'painful subcutaneous tubercles' [6]. They tend to be benign and rarely occur. They may arise from anywhere in the glomus apparatus and tend to be a result of hyperplasia of one

or more of the constituents [7,8]. Although typically solitary, multifocal glomus tumours have been described [1,2]. An exceptionally rare phenomenon, malignant transformation after recurrence or dedifferentiation of a benign glomus tumor, has been described [1,9]. Studies have described metastasis to regional lymph nodes and lungs [10,11].

The tumours have been described as small purplish lesions presenting with a classic triad of paroxysmal pain, exquisite tenderness and sensitivity to cold [12]. The tenderness explained as a result of the proliferation of the normal capsular neural glomus apparatus. This triad is typically described in lesions occurring on the hands. However, symptom variability and nonspecificity can often lead to misdiagnosis. Clinically, they may be confused with other pathologies such as neuromas, arthritides and gout [2]. This leads to delayed diagnosis and appropriate management, which can result in the patient enduring symptoms needlessly. This is demonstrated in the present case because there was a 15-year delay to diagnosis. There has been a reported diagnostic delay between 4 months to 40 years [8,13].

Glomus tumours tend to occur in the third to fifth decade of life with a 2:1 ratio of male to female [14]. Approximately 80% of glomus tumours are located in the upper extremities and more than 75% of these are located subungually [13]. This is consistent with the concentration of these receptors being greatest in this region. Although the incidence of glomus tumours is as yet unknown, they are reported to represent less than 2% of primary hand tumours [1,8,15]. Many extra-digital glomus tumours have been reported [16]. As well as the lower limb, these include the forearm [15], and triceps tendon [17]. A recent study described a strong epidemiologic association between these tumours and neurofibromatosis [1].

To our knowledge, this is the first case report of a glomus tumour misdiagnosed as persistent olecranon bursitis. Other reports have described glomus tumours in the forearm [15], medial elbow resulting in medial cutaneous nerve of the forearm symptoms [18] and ulnar nerve symptoms [13]. The initial symptom of a painful swelling was nonspecific and was originally diagnosed as an olecranon bursitis as a result of its location. However, this was unrelated to movement of the limb. Symptomatic management was short lived and it was not until the swelling began to increase in size that the patient sought advice again.

Glomus tumours are typically slow growing, as was the case with our patient. It was in the latter stage that our patient began to develop hypersensitivity of the swelling another of the classic triad symptoms. In view of his improved symptoms initially following injection, it may be possible that there was a concurrent olecranon bursitis resulting from the glomus tumour. Clinical examination followed by imaging may have assisted with earlier diagnosis. In tumours of the hand, studies suggest that the initial investigation of choice should be ultrasonography [15,18]. More recently, magnetic resonance imaging has shown to be a useful diagnostic aid [2,4,7,8], although this modality does have a low negative predictive value in

smaller tumours [12]. However, the use of short tau inversion recovery sequences, high-resolution magnetic resonance imaging and the addition of intravenous contrast have been shown to aid in the diagnosis of this rare entity, and to detect small tumours [19–21].

Having a high index of suspicion for these rare tumours should enable earlier diagnosis, appropriate referral and management, leading to improve patient outcome and quality of life. Interestingly, despite no recurrence in our case after 12 months, the post-surgical recurrence rate is approximately 10% [22].

Conclusions

Glomus tumours, although rare, should be considered in the differential diagnosis of posterior elbow swellings. They may mimic more commonly presenting conditions, such as olecranon bursitis. Moreover, early onward referral for further investigation and management is recommended to confirm diagnosis, alleviate patient concerns and symptoms, and improve function.

ACKNOWLEDGEMENTS

We thank Dr A Chaturvedi (Consultant Histopathologist at University Hospital of South Manchester) for histology slide preparation and image production.

References

1. **Harrison B, Moore AM, Clafée R, Sammer DM.** The association between glomus tumors and neurofibromatosis. *J Hand Surg Am* 2013;38:1571–74.
2. **McDermott EM, Weiss AP.** Glomus tumors. *J Hand Surg Am* 2006;31:1397–400.
3. **Drape JL, Idy-Peretti I, Goettmann S, et al.** Subungual glomus tumors: evaluation with MR imaging. *Radiology* 1995;195:507–15.
4. **Theumann NH, Goettmann S, Le Viet D, et al.** Recurrent glomus tumors of the fingertips: MR imaging evaluation. *Radiology* 2002;223:143–51.
5. **Miettinen M, Paal E, Lasota J, Sobin LH.** Gastrointestinal glomus tumors. A clinicopathologic, immunohistochemical and molecular genetic study of 32 cases. *Am J Surg Pathol* 2002;26:301–11.
6. **Wood W.** On painful subcutaneous tubercle. *Edinburgh Med Surg J* 1812;8:283–91.
7. **Ham KW, Yun IS, Tark KC.** Glomus tumors: symptom variation and magnetic resonance imaging for diagnosis. *Arch Plas Surg* 2013;40:392–96.
8. **Carroll RE, Berman AT.** Glomus tumors of the hand: review of the literature and report on twenty-eight cases. *J Bone Joint Surg* 1972;54A:691–703.
9. **Aiba M, Hirayama A, Kuramochi S.** Glomangiosarcoma in a glomus tumor: an immunohistochemical and ultrastructural study. *Cancer* 1988;61:1467–71.
10. **Binesh F, Akhavan A, Zahir ST, Bovanlu TR.** Clinically malignant atypical glomus tumour. *BMJ Case Rep.* 2013; 2013.pii: bcr2012007618. doi: 10.1136/bcr-2012-007618.
11. **De Chiara A, Apice G, Mori S, et al.** Malignant glomus tumour: a case report and review of the literature. *Sarcoma* 2003;7:87–91.
12. **Al-Qattan MM, Al-Namla A, Al-Thunayan A, et al.** Magnetic resonance imaging in the diagnosis of glomus tumours of the hand. *J Hand Surg Br* 2005;30:535–40.
13. **Heiney JP, Leeson MC.** Unique size and location of a glomus tumor with a review of the literature. *J Shoulder Elbow Surg* 2009;18:E1–3.
14. **Diao E, Moy OJ.** Common tumors. *Orthop Clin North Am* 1992;23:187–96.
15. **Nigam JS, Misra V, Singh A, Karuna V, Chauhan S.** A glomus tumour arising from the flexor aspect of the forearm: a case report with a review of the literature. *J Clin Diag Res* 2012;6:1559–61.
16. **Schiefer TK, Parker WL, Anakwenze OA, Amadio PC, Inwards CY, Spinner RJ.** Extradigital glomus tumors: a 20-year experience. *Mayo Clin Proc* 2006;81:1337–44.
17. **Tomak Y, Dabak N, Ozcan H.** Extradigital glomus tumor of the triceps tendon as a cause of elbow pain: a case report. *J Shoulder Elbow Surg* 2003;12:401–2.
18. **White CP, Jewer DD.** Atypical presentation of a glomus tumour: a case report. *Can J Plast Surg* 2006;14:237–38.
19. **Fujioka H, Kokubu T, Akisue T, et al.** Treatment of subungual glomus tumor. *Kobe J Med Sci* 2009;55:E1–4.
20. **Sorene ED, Goodwin DR.** Magnetic resonance imaging of a tiny glomus tumour of the fingertip: a case report. *Scand J Plast Reconstr Surg Hand Surg* 2001;35:429–31.
21. **Hou SM, Shih TT, Lin MC.** Magnetic resonance imaging of an obscure glomus tumour in the fingertip. *J Hand Surg Br* 1993;18:482–3.
22. **Gombos Z, Zhang PJ.** Glomus tumor. *Arch Path Lab Med* 2008;132:1448–52.