GLOMUS TUMOUR IN THE FOREARM: A CASE REPORT AND REVIEW OF MRI FINDINGS

S. Lee, H. Le, P. Munk, D. Malfair, Ch.H. Lee, P. Clarkson

Glomus tumours are uncommon benign neoplasms characterised by the proliferation of modified smooth muscle cells known as glomus cells. Glomus tumours are well described in the extremities, particularly in the sub-ungual region and MRI is well established as the investigation of choice. However, a significant proportion of glomus tumours are extra-digital, but the discussion of MRI findings of extra-digital tumours is limited and restricted to case reports. We present a case of a solitary painful forearm lesion in an 81-year-old man, and review the English literature on extra-digital glomus tumours documenting MR imaging features. Radiologists should be aware of the existence of these lesions, particularly in the setting of chronic pain and focal tenderness.

Key-words: Paraganglioma – Extremities, MR.

Case report

An 81-year-old man presented with a sub-cutaneous nodule in the dorsal forearm that had been slowly growing over 10 years. It was slightly bluish in colour. It had become increasingly painful and was exquisitely tender on palpation.

MRI demonstrated a 6 x 12 x 14 mm ovoid subcutaneous lesion which abutted the superficial muscular fascia on the extensor compartment (Fig. 1). It was hypointense on T1 and hyperintense on T2 and STIR. It was well margined and no intralesional fat was seen. There was no blooming seen on gradient echo sequence. On ultrasound, the lesion was solid but uniformly hypechoic.

Fig. 1. — MRI left proximal forearm (GE echospeed 1.5T) demonstrating a subcutaneous lesion overlying the extensor compartment (arrow). A: TE 14 TR73, B: TE105 TR3700. The lesion is well defined with a hypointense capsule. It is hypointense on T1 and hyperintense on T2 relative to muscle.

Fig. 2. — High power H&E stain of core biopsy demonstrating nests to sheets of uniform rounded cells with centrally located round nuclei and eosinophilic cytoplasm, set in a richly vascular background of capillary-sized vessels.

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An ultrasound guided core biopsy was performed, which showed nests of uniformly appearing rounded cells with centrally located round nuclei and eosinophilic cytoplasm, set in a richly vascular background of capillary-sized vessels with varying degree of perivascular hyalinization (Fig. 2). There were no mitotic figures or cytologic atypia present. Tumour cells demonstrated strong H-caldesmon and moderate smooth

<table>
<thead>
<tr>
<th>Author</th>
<th>Age/Sex</th>
<th>Site &amp; Presentation</th>
<th>Presentation</th>
<th>MRI</th>
<th>Ultrasound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith</td>
<td>62 F</td>
<td>Radial nerve</td>
<td>Pain</td>
<td>-</td>
<td>25 mm hypoechoic well defined lesion</td>
</tr>
<tr>
<td>Mabit</td>
<td>45 M</td>
<td>Patellar tendon</td>
<td>Pain</td>
<td>Ovoid 1 cm, ↑T1, Only T1 weighted sequences performed</td>
<td>Patella tendon enlarged and hypoechoic.</td>
</tr>
<tr>
<td>Yoshikawa</td>
<td>35 M</td>
<td>Supraspinatus</td>
<td>Pain</td>
<td>Ovoid 4 x 2 cm ←→ T1, ↑T2</td>
<td>Ovoid hypoechoic mass</td>
</tr>
<tr>
<td>Amillo</td>
<td>38 F</td>
<td>Vastus lateralis</td>
<td>Pain</td>
<td>Ovoid, 3 cm ↓T1, ↑T2, Enhanced, central non-enhancing area</td>
<td></td>
</tr>
<tr>
<td>Mohler</td>
<td>55 F</td>
<td>Plantar foot</td>
<td>Pain</td>
<td>Ovoid 1 cm, ↓T1, ↑T2</td>
<td></td>
</tr>
<tr>
<td>Hardy</td>
<td>65 M</td>
<td>Hoffa fat pad</td>
<td>Pain</td>
<td>Ovoid 10 mm ↓T1, ↑T2</td>
<td></td>
</tr>
<tr>
<td>McDonald</td>
<td>40 M</td>
<td>Buttock – subcutaneous</td>
<td>Pain</td>
<td>Ovoid 6 mm ↓T1, ↑T2</td>
<td></td>
</tr>
<tr>
<td>Abela</td>
<td>52 M</td>
<td>Scapula region - subcutaneous</td>
<td>Dull ache</td>
<td>Round 10 mm ←→ T1, ↑STIR</td>
<td>Hyper-echoic, well defined, prominent vascularity [not shown]</td>
</tr>
<tr>
<td>Gonzalez-Llanos</td>
<td>50 M</td>
<td>Periosteal, distal femoral diaphysis</td>
<td>Pain</td>
<td>Ovoid 12 mm ↓T1, ↑T2</td>
<td>Ovoid, hypoechoic</td>
</tr>
<tr>
<td>Waseem</td>
<td>73 M</td>
<td>Subcutaneous knee</td>
<td>Pain</td>
<td>Ovoid 50 mm ↓T1, ↑T2</td>
<td>Enhanced.</td>
</tr>
<tr>
<td>Senol</td>
<td>21 M</td>
<td>Forearm, superficial, adjacent to ulnar sensory nerve</td>
<td>Pain, neuralgia</td>
<td>Ovoid 20 x 10 mm ←→ T1, ↑T2, ↑TIRM, enhanced.</td>
<td></td>
</tr>
</tbody>
</table>

Legend:
↑ Increased signal intensity compared to muscle
↓ Decreased signal intensity compared to muscle
←→ Signal intensity similar to muscle.
were administered gadolinium demonstrated at least some contrast enhancement. Gonzalzar, Senol, and Hardy described non-homogenous enhancement (4-6). Amilho had a case of a 3 cm lesion within vastus lateralis that had a central non-enhancing area on the presented image; however, this finding was not discussed (7). Yoshikawa performed a non-contrast MR, but the post-contrast CT demonstrated peripheral enhancement of the lesion (8). Yoshikawa also documented multiple small foci of calcifications within the lesion. Our case demonstrated similar imaging characteristics with a well defined lesion showing T1 hypointensity and T2 hyperintensity. We did not administer gadolinium. The MR imaging features are non-specific and the differential diagnosis will include nerve sheath tumours, epidermal cysts, venous malformations, nodular fasciitis, and angioleiomyoma. Cat-scratch disease may also have similar imaging characteristics but the lesions are typically located at nodal stations such as epitrochlear region of the elbow and axilla.

There is some variability of the ultrasound appearance of extradigital glomus tumours. In our case, the lesion was well defined, solid, and uniformly hypoechoic. This is similar to that reported by Smith, Amilho, and Gonzalez (9, 7, 4). Abela showed a case of a subcutaneous lesion in the shoulder region which was hyperechoic (3). Mabity presented a case of a lesion within the patellar tendon which showed expansion of the tendon with hypochogenicity, but it was not mentioned whether there was a discrete lesion seen on ultrasound (10).

Pathologically, glomus tumours are usually small well-defined lesions. Microscopically, the tumour cells are uniform and round in shape with eosinophilic cytoplasm and centrally located round nuclei. The appearance can vary depending on the relative amount of glomus cells, vascular structures and smooth muscle (15). The current case shows the solid pattern with a predominance of glomus cells arranged in solid nests surrounded by capillary sized vessels. In contrast, lesions showing a predominance of dilated venous vessels and a predominance of smooth muscle cells are referred to as glomangiomas and glomangiomyomas respectively. Immunohistochemically, glomus cells are positive for vimentin, smooth muscle actin and H-caldesmon, and lack the expression for epithelial, melanocytic and vascular markers.

Treatment is surgical excision. Recurrence is rare, and usually related to incomplete excision. Malignant glomus tumours and metastases have been reported but are extremely rare (16, 17). These malignant glomus tumours typically occur in the subfascial or visceral locations, are larger (> 2 cm) in size and demonstrate malignant or atypical histological features that include marked cytologic atypia and increased mitotic activity with atypical mitotic figures (15).

Although rare, radiologists should be aware of extra-digital glomus tumours. Although the imaging features are non-specific, the clinical notion of pain is an important clue in the characterisation process. Prompt diagnosis and complete excision of the tumour often alleviates patient's pain.

References