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CASE REPORT
Hand

Forearm Granular Cell Tumor: A Rare Entity

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Summary: Granular cell tumors are uncommon benign masses. They occur rarely and are usually solitary, nontender lesions, with a tendency to occur in the head and neck region and a predilection for the tongue. A malignant variant is even less common. To date, its origin remains uncertain. We report the case of a 19-year-old Egyptian man who presented to the Kasr eini Plastic Surgery Clinic with a swelling on the posterior aspect of his right forearm. After surgical excision and histopathological examination, it was found to be a granular cell tumor. This finding was of interest because of the rarity of the neoplasm in general, but in particular because of the scarcity of its occurrence in this anatomic location and the patient's sex, and age group. *(Plast Reconstr Surg Glob Open 2023; 11:e5485; doi: 10.1097/GOX.0000000000005485; Published online 19 December 2023.)*

Granular cell tumors (GCTs), initially termed myoblastenmyomes due to their histological resemblance to skeletal muscle cells in paraffin sections, have been a subject of considerable debate since their first description by Abrikossoff in 1926. However, with the advent of electron microscopy and immunohistochemistry studies, a shift occurred supporting the association of these tumors with Schwaniann neoplasms. Nevertheless, despite these advancements, the histogenesis of GCTs remains elusive and continues to pose a challenge in current understanding.[1–6]

The lesions are pervasive in their anatomical locations[1] but are most common in the head and neck region. It has been reported that more than 50% occur in the mouth, specifically the tongue.[3] Other organs and tissues are not exempt from sheltering them.[1,4,5,7] The tumor is uncommon, usually small, solitary, benign, painless, and may be found incidentally.[8] An estimated 1%–2% of GCTs exhibit malignant behavior.[2,4,6] Differentiation between benign and malignant tumors is of utmost importance, as complete excision of benign tumors renders the patient fully cured. However, incompletely excising malignant tumors will result in recurrence, lower survival rates, and a higher incidence of metastasis.[1,4,9] The tumors can occur at any age but are more commonly encountered between the fourth and sixth decades of life. They are also cited as more common in women than men, with a 3:1 ratio[1,5,6]; however, this ratio needs to be more persistent in the literature.[8] GCTs are frequently clinically misdiagnosed because their presentation is not dissimilar to numerous other swellings. Consequently, accurate identification and differentiation are typically achieved through histopathological assessment.

We report on our findings in a patient with a benign form of GCT in a rare location, precisely, the posterior aspect of the forearm.

CASE

A 19-year-old male patient presented with a firm swelling on the posterior aspect of his right forearm (extensor zone 8) of 1-year duration, a sudden onset, and progressively enlarging course (see Fig. 1). The swelling was not associated with numbness, paraesthesia, or affection of motor power. It increased in size with muscle contraction, suggesting on clinical examination that the swelling was superficial to the muscles (see Figs. 2 and 3). magnetic resonance imaging (MRI) was ordered for the right forearm, and it revealed a subcutaneous well-defined oval mass lesion measuring 2.1×1.1 cm in axial dimensions (Fig. 4). Typical MRI signal pattern of the examined bones and standard study of the examined muscles with preserved intermuscular fat planes were present (see Figs. 2 and 3). The tumor was surgically excised under general anesthesia by applying a tourniquet over the arm. The incised skin was closed with 3-0 Prolene interrupted transverse mattress sutures. A Steripad bandage was used, and a light-fitting crepe bandage was lightly applied on top of it. The patient was instructed to elevate his forearm in the immediate postoperative period. Sutures were removed 2 weeks postoperatively, and recovery was uneventful. After surgical removal and histopathological examination, the tumor returned as a benign granular cell tumor.

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Fig. 1. Preoperative image of the posterior aspect of the patient's right forearm and dorsum of right hand depicting the swelling in extensor zone 8.

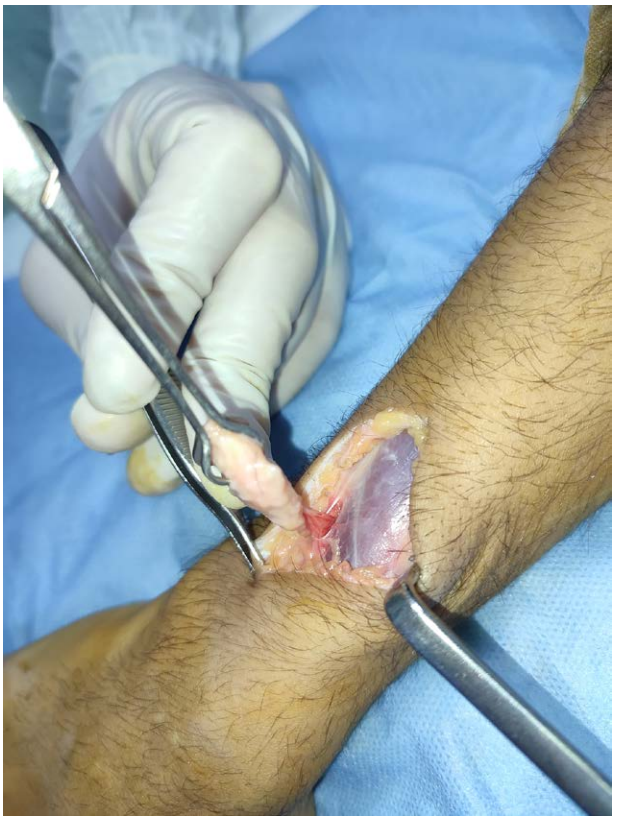

Fig. 2. Intraoperative image of granular cell tumor during excision. The tumor was found superficial to the muscles in the posterior aspect of the forearm.

DISCUSSION

Granular cell tumors (GCTs) are infrequent benign proliferations that have been documented to manifest at various anatomical sites throughout the body. Nevertheless, a prevailing observation suggests that the head and neck region represents the predominant location for GCT occurrence, accounting for approximately 65% of cases, with the tongue serving as the primary site in approximately 70% of these instances.[3,10–13]

In 2017, Stemm et al published the most extensive study about GCTs arising from soft tissue, which had yet to be thoroughly studied. They reviewed the electronic files of the GCT cases of the Ohio State Medical Center Department of Pathology, only including the GCTs that occurred exclusively in soft tissues. They defined "soft tissue tumors" as those involving the subcutaneous or intramuscular tissue without the involvement of skin or other organs. Their study revealed that the most common location of granular cell soft tissue tumors was in the upper extremity, which accounted for 31.4% of the cases they studied. They also concluded that GCTs arising from soft tissues were more prominent in size, were more commonly incompletely excised, and had a higher incidence of showing atypical features.[6]

Therefore, although the most common location of GCTs, in general, is the head and neck region, those specifically occurring in soft tissues show a higher predilection for the upper extremity at 31.4% of soft tissue tumors, which is still a rare finding.[3,6,11–13]

Male-to-female prevalence is debated throughout the literature. For example, Vance and Hudson published a study in 1969 of 42 cases that showed women more commonly harboring the tumor[12]; however, a literature review and 10-year study published in 1979 showed no predilection for either sex. What is a constant finding in most literature is the mystery behind the origin of the tumor, with the dispute remaining unsettled to date; however, the tumor being of neurogenic origin is what is recently favored.[13] Occurrence is usually between the fourth and sixth decades of life.[1,5,11–13]

GCTs are typically benign; however, due to their propensity for local invasion, multicentricity, and associated pseudoepitheliomatous hyperplasia, surgeons should be aware of their potential risks. These include the likelihood of recurrence if only marginally excised and the potential future development of similar lesions.[13]

CONCLUSIONS

In conclusion, as most of the literature on GCTs of soft tissues comes from case reports or small case series, we report a case of GCT on the dorsum of the right forearm, which is a rare presentation for GCTs in general, albeit the upper extremity is the most common anatomic location for a soft tissue GCT. The definitive diagnosis is made by immunohistochemical examination. Histogenesis to date

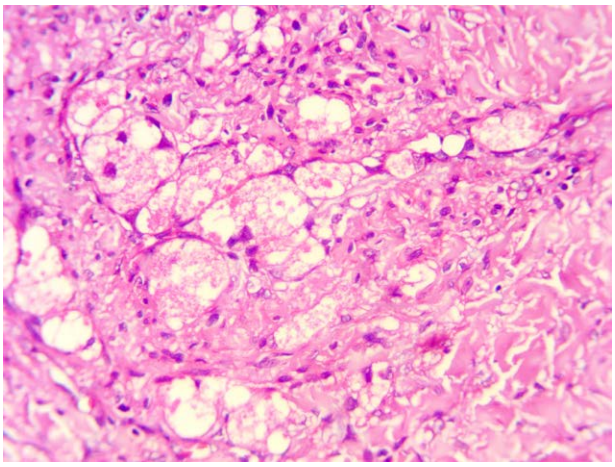

Fig. 3. High-power image of GCT under an electron microscope. Histopathological picture of the granular cell tumor showing groups of cells with abundant granular cytoplasm. Minimal nuclear pleomorphism is evident.

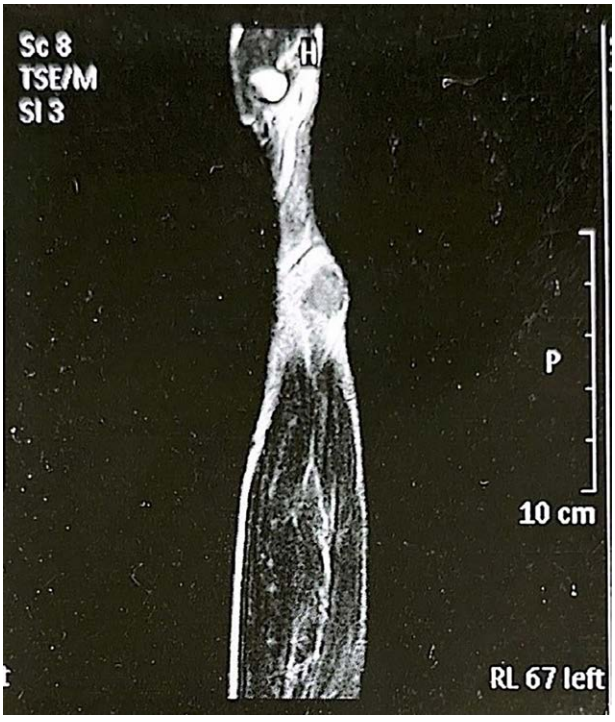

Fig. 4. MRI examination of coronal cuts of the right forearm showing a forearm subcutaneous lesion eliciting intermediate T1/T2 and high STIR signal. It is seen abutting the related aspect of the extensor muscles and tendons with no muscle or tendon invasion.

remains a source of controversy. Clinicians should be aware of this finding in the differential diagnosis of tumors in the upper limb. Surgical excision of the tumor is the safest and most feasible treatment. The surgeon excising a soft tissue lesion should be aware that GCTs of soft tissues have a higher recurrence rate and should be followed more closely, as they can behave more aggressively than dermal or organ-confined tumors.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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