SKIN

BRIEF ARTICLE

Granular Cell Tumor on the Finger of a 7-Year-Old Boy: A Case Report

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ABSTRACT

Granular cell tumor (GCT) is a rare neoplasm originating from Schwann cells and is classified into benign and malignant subtypes. This report presents the case of a 7-year-old boy with a GCT located on the third finger of his right hand. The lesion measured 1 cm × 1 cm and was characterized by a nodular appearance with a keratotic surface, well-defined borders, and a scaly collar at the base. Histopathological examination revealed the presence of large polyhedral cells with small, centrally located, hyperchromatic nuclei and cytoplasm filled with eosinophilic granules, consistent with a benign granular cell tumor. This case highlights the importance of thorough histopathological evaluation and interdisciplinary collaboration in the accurate diagnosis and management of GCT, particularly in pediatric patients and in atypical locations.

INTRODUCTION

Granular cell tumor (GCT) is a rare neoplasm that originates from Schwann cells, initially described by Abrikossoff in 1926. It is classified into benign and malignant subtypes. The benign form is more common, typically measuring less than 2 cm, whereas the malignant subtype is less frequent but can grow up to 15 cm. Malignant transformations are rare, occurring in less than 2% of cases. The overall prevalence of GCT is estimated at 0.019% to 0.03% in the general population.[1]

GCT can occur at various anatomical sites, including the skin, subcutaneous tissues, and mucosal surfaces, with the head, neck, and trunk being the most common locations. Although less common, GCTs can also involve internal organs, more rarely originating from muscle tissue.[2]

Clinically, the presentation of GCT varies widely, with many cases being asymptomatic or incidentally discovered. Histopathological features include infiltrative growth patterns, varying tumor sizes, and occasional mucosal involvement.[3] This expanded understanding of GCT's histogenesis sheds light on its pathophysiology, aiding in the accurate

diagnosis and treatment of this rare neoplasm.[4]

The histogenesis of GCT has been a subject of debate; it was initially thought to originate from myoblasts due to their infiltration among muscle bundles. However, contemporary evidence supports that these tumors originate from Schwann cells, as indicated by morphological, immunohistochemical, and ultrastructural findings.[1]

CASE REPORT

A 7-year-old boy presented with a mass on the third finger of his right hand. The lesion, present for 2 years, was characterized by depressed hyperpigmentation, firm consistency, and mild tenderness. The patient had no significant medical, family, or genetic history, and no prior interventions were reported.

On physical examination, a 1 cm × 1 cm lesion was observed on the third finger of the right hand. The lesion had a nodular appearance with a keratotic surface, well-defined borders, and a scaly collar at its base, located on the external lateral side (**Figure 1**). No discharge, systemic symptoms, or regional lymphadenopathy were noted. Initially suspected to be a pyogenic granuloma, a shave biopsy was performed, revealing a GCT, also known as Abrikossoff tumor.

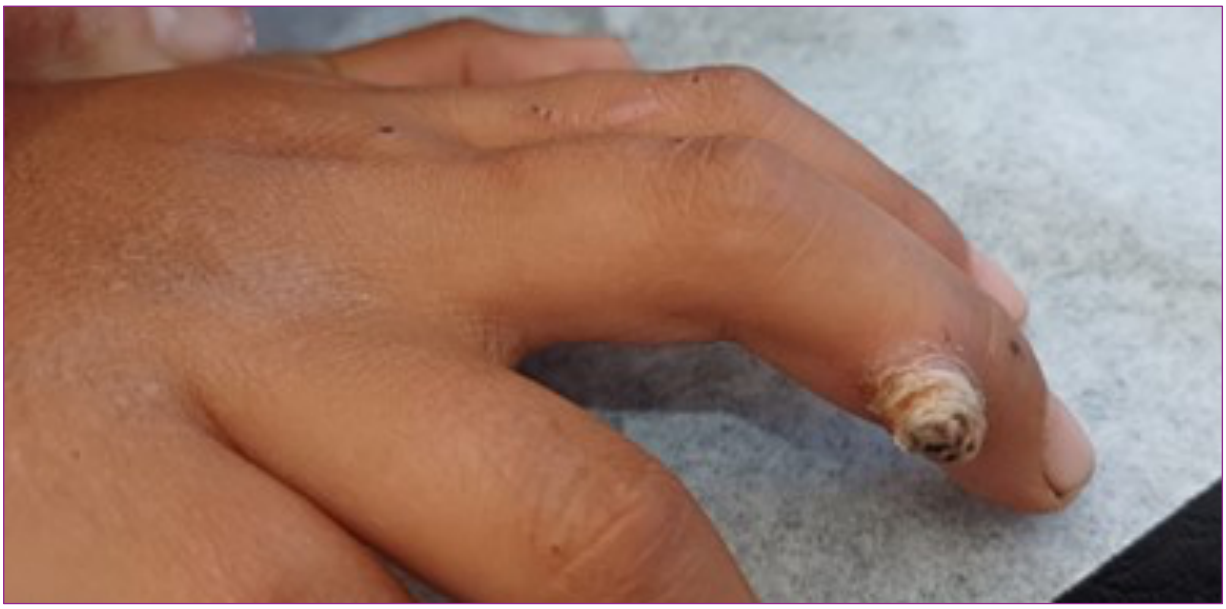

Figure 1. Giant cell tumor located on the third finger of the right hand in a 7-year-old boy, presenting as a nodular lesion with a kerattic surface, well-defined borders, and a scaly collar at the base, measuring 1 cm × 1 cm.

The lesion had started developing approximately 2 years prior to the current presentation, showing slow and gradual growth. Diagnostic confirmation was achieved through physical examination and histopathological analysis of the biopsy. Histopathology revealed a benign GCT characterized by large polyhedral cells with small, centrally located hyperchromatic nuclei and cytoplasm filled with eosinophilic granules (**Figure 2**). These findings confirmed the benign nature of the tumor and suggested regular monitoring due to its location and growth pattern.

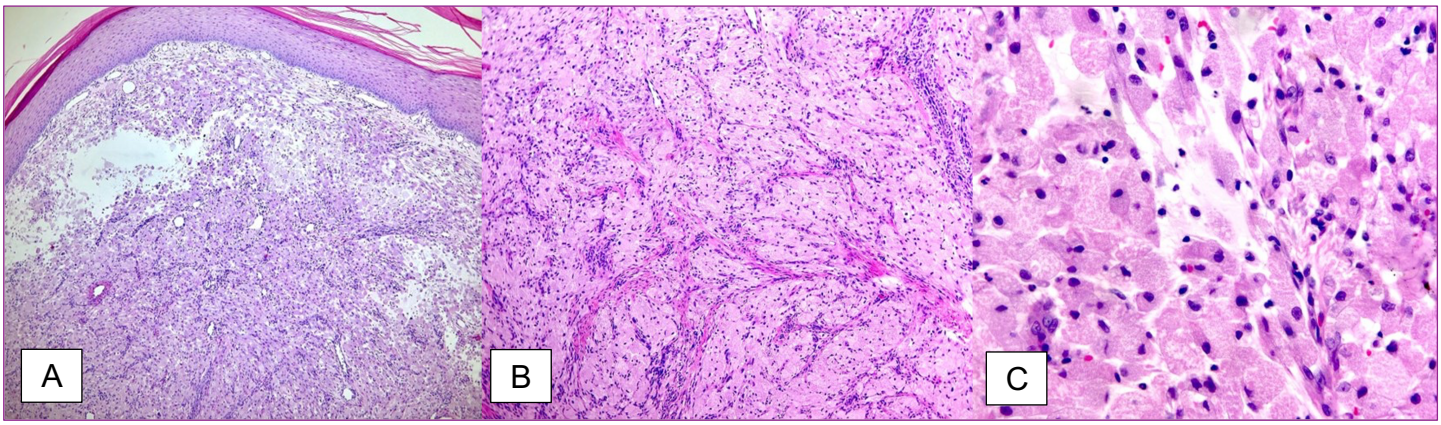

Figure 2. (A) Histological section of a granular cell tumor stained with hematoxylin and eosin. There is a proliferation of large cells with eosinophilic granular cytoplasm and round to oval nuclei. Clear areas within the tumor parenchyma suggest possible necrosis or cystic degeneration. (B) Higher magnification of the granular cell tumor showing irregular architecture and infiltration into the surrounding connective tissue. Cells display variability in size and shape, with abundant granular cytoplasm, typical features of this type of neoplasm. (C) Close-up view of the granular cell tumor, emphasizing the characteristic granular cytoplasm and hyperchromatic nuclei of the tumor cells. (10 × magnification–H & E stain).

DISCUSSION

This case underscores the importance of considering GCTs as a differential diagnosis when encountering pediatric patients with similar lesions. The benign nature of GCTs, combined with their distinctive histopathological features, emphasizes the need for accurate diagnostic procedures to avoid overtreatment and unnecessary anxiety for patients and their families.

The diagnosis in this case was confirmed through histopathological analysis, which revealed large polyhedral cells with eosinophilic granules and the absence of necrosis, atypical mitotic figures, or pleomorphism. These findings were sufficient to establish the benign nature of the lesion without requiring advanced imaging techniques such as MRI. Recognizing these distinctive features is essential to differentiate GCTs from other hand tumors, such as hemangiomas, lipomas, glomus tumors, and tenosynovial giant cell tumors, and to guide appropriate management.

Below, we discuss the differences between GCTs and other common hand tumors such as hemangiomas, lipomas, glomus tumors, and tenosynovial giant cell tumors to highlight their distinguishing features. (**Table 1**)

Granular Cell Tumor (GCT)

GCTs typically present as firm, hyperpigmented lesions. Histopathologically, they are characterized by large polyhedral cells with eosinophilic granules, confirming their benign nature.[6]

Hemangioma

Hemangiomas are often present as painless masses and are characterized by vascular channels and phleboliths on MRI or ultrasound. Unlike GCTs, hemangiomas show intense hyperintensity on T2-weighted MRI and homogeneous gadolinium enhancement.[7]

Table 1. Comparison of common soft tissue tumors of the hand, highlighting their typical presentation, diagnostic methods, and distinguishing histopathological features. Sources: Nepal et al., 2019 (1); Lans et al., 2022 (2).

Tumor Type	Common Location	Presentation	Diagnosis	Differentiation
Granular Cell Tumor	Various	Firm, hyperpigmented lesion	Histopathology	Eosinophilic granules
Hemangioma	Hands	Painless mass	MRI, Ultrasound	Vascular channels, phleboliths
Lipoma	Hands	Painless, mobile mass	MRI, Ultrasound	Fat signal on MRI
Glomus Tumor	Hands	Painful, subungual mass	MRI, Ultrasound	Intense vascularity
Tenosynovial Giant Cell Tumor	Hands	Lobulated, painless mass	MRI	Hemosiderin, giant cells

Lipoma

Lipomas present as painless, mobile masses and show fat signals on MRI. Histologically, they consist of mature adipose tissue, which differentiates them from GCTs that lack adipose components and feature eosinophilic granules.[7]

Glomus Tumor

Glomus tumors are typically painful and located subungually. They are distinguished by intense vascularity on MRI and post-contrast enhancement, features not seen in GCTs.[7]

Tenosynovial Giant Cell Tumor (TGCT)

TGCTs are lobulated, painless masses adjacent to tendons, identified by hemosiderin-laden histiocytes and giant cells on histopathology. They are more locally aggressive than GCTs and have a higher recurrence rate.[7]

CONCLUSION

Recognizing GCT, particularly in atypical locations such as the fingers in pediatric patients, is crucial for ensuring appropriate management and avoiding unnecessary interventions. Accurate histopathological evaluation and differentiation from other soft tissue tumors of the hand, such as hemangiomas, lipomas, glomus tumors, and TGCTs, are essential for providing optimal patient care. A correct diagnosis can prevent unnecessary interventions, including repeated biopsies, unwarranted imaging studies, or overly aggressive surgical excisions, which may cause additional anxiety and physical burden for pediatric patients and their families. This case contributes to the literature by highlighting the distinctive features of GCTs and emphasizing the importance of considering this rare diagnosis in clinical practice.

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