Case Report

Giant cell tumor of tendon sheath of the foot: A rare case report

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ABSTRACT

Giant cell tumor of tendon sheath (GCTTS) is a benign soft-tissue lesion arising from the synovium of tendon sheaths and is most commonly encountered in the fingers and hand. Involvement of the foot is uncommon and may lead to delayed diagnosis due to its indolent clinical course. We report a case of a 36-year-old male who presented with a painless, gradually progressive swelling over the right foot for 5 years. Radiological evaluation, including ultrasonography and magnetic resonance imaging, suggested a soft-tissue tumor with features suspicious of GCTTS. Fine-needle aspiration cytology revealed a giant cell-rich lesion. Complete surgical excision was performed, and histopathological examination confirmed the diagnosis of localized type GCTTS. This case emphasizes the importance of clinicoradiological correlation and histopathology in the diagnosis of long-standing soft-tissue swellings of the foot.

Key words: Foot, Giant cell tumor of tendon sheath, Histopathology, Soft-tissue tumor

Giant cell tumor of tendon sheath (GCTTS) is a benign proliferative lesion originating from the synovium of tendon sheaths, bursae, or joints [1]. It represents the second most common soft-tissue tumor of the hand after ganglion cysts [2]. GCTTS accounts for approximately 1–2% of all soft-tissue tumors, with involvement of the foot reported far less frequently than the hand and wrist [3]. Clinically, it presents as a slow-growing, painless mass, often leading to delayed presentation. Involvement of the foot poses a diagnostic challenge due to its rarity and wide differential diagnoses. We report a case of localized GCTTS of the foot with detailed clinical, radiological, surgical, and histopathological findings.

CASE REPORT

A 36-year-old male presented with a painless swelling over the dorsum of the right foot, which had gradually increased in size over a period of 5 years (Fig. 1). There was no history of trauma, fever, or systemic illness. On local examination, a firm, non-tender swelling was noted over the dorsal aspect of the right foot in the region between the second and third digits. The swelling was mildly mobile and appeared attached to the underlying tendon sheath. The overlying skin was normal. Neurovascular examination of the foot was unremarkable, and the range of motion of the adjacent toes was preserved.

Ultrasonography revealed a well-defined heteroechoic lesion without internal vascularity, measuring approximately 1.8 × 1.7 × 1.6 cm, extending into the subcutaneous plane [4]. Magnetic resonance imaging demonstrated a well-defined soft-tissue lesion measuring approximately 37 × 19 mm on the dorsal surface of the foot between the second and third interphalangeal spaces. The lesion appeared hyperintense on proton density images and isointense on T2-weighted images, with heterogeneous post-contrast enhancement. Mild pressure effect on the adjacent bone and extension into the intervening tendon and soft tissue were noted. A radiological diagnosis of GCTTS was suggested [5]. The difference in lesion size between ultrasonography, magnetic resonance imaging (MRI), and gross examination was attributed to variation in imaging planes, lesion extent, and intraoperative measurement. Fine-needle aspiration cytology revealed moderately cellular smears composed of foamy macrophages and multinucleated giant cells in a background of lymphocytes and occasional plasma cells, without cytological atypia.

The patient underwent complete surgical excision through a dorsal longitudinal incision. Intraoperatively, the lesion was well-circumscribed, lobulated, and firmly attached to the tendon sheath, without infiltration into adjacent bone or muscle. The mass was excised in toto.

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Post-operative recovery was uneventful, and the patient was advised of routine wound care and follow-up. The patient was relieved following surgical excision, as the swelling had been gradually increasing for several years. He expressed satisfaction with the outcome and reported no discomfort or limitation in daily activities during follow-up.

At 6-month follow-up, the patient remained asymptomatic with no clinical evidence of recurrence and had full functional recovery.

Pathological Findings

Gross examination revealed a lobulated, grayish-white to grayish-brown soft-tissue mass measuring 4.5 × 3 × 2 cm. The external surface was irregular, and the cut surface showed heterogeneous grayish-yellow to brown areas. The lesion was well circumscribed and unencapsulated (Fig. 2).

Microscopic examination showed a tumor composed predominantly of mononuclear cells with abundant cytoplasm, admixed with occasional multinucleated giant cells (Fig. 3). Foci of hemosiderin-laden macrophages were present in a background of hyalinized stroma and fibrocollagenous tissue. No significant nuclear atypia or increased mitotic activity was identified (Fig. 4). These features were consistent with GCTTS, localized type [1,3].

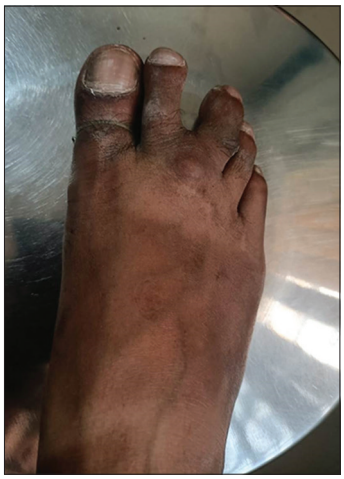

Figure 1: Clinical photograph showing a well-defined swelling over the dorsum of the right foot involving the region between the second and third digits

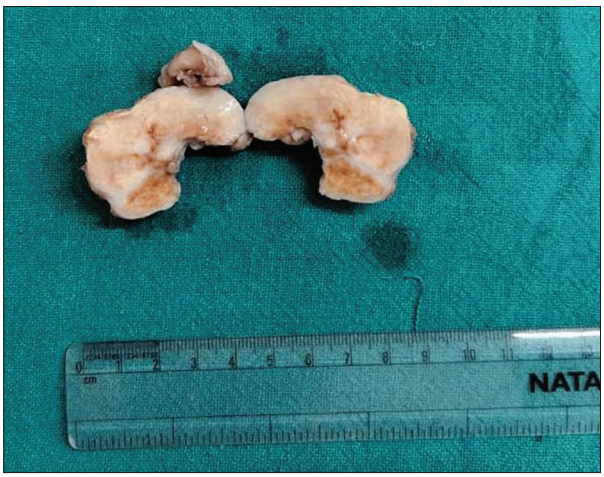

Figure 2: Gross photograph of the excised specimen showing a lobulated, grayish-white to grayish-brown soft-tissue mass with heterogeneous cut surface

DISCUSSION

GCTTS is a benign lesion characterized by synovial-like mononuclear cells, multinucleated giant cells, foamy macrophages, and hemosiderin deposition [1]. It is considered the localized counterpart of pigmented villonodular synovitis and most commonly affects the hand, particularly the fingers [2]. Involvement of the foot is uncommon and accounts for a small proportion of reported cases [3,6].

The exact pathogenesis of GCTTS remains uncertain, with proposed mechanisms including inflammatory, traumatic, and neoplastic origins, with recent studies suggesting a role of CSF1 overexpression [7,8].

Clinically, GCTTS presents as a slow-growing, painless mass, which often leads to delayed diagnosis,

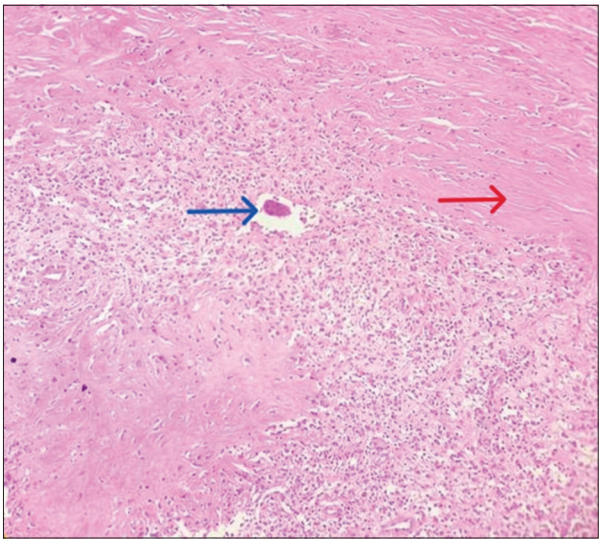

Figure 3: Photomicrograph (H&E, ×100) showing a cellular lesion composed of mononuclear cells with scattered multinucleated giant cells (blue arrow) in a fibrocollagenous stroma (red arrow)

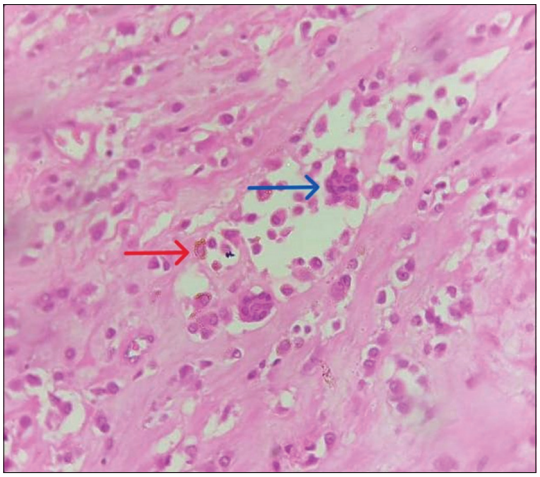

Figure 4: Photomicrograph (H&E,×400) highlighting multinucleated giant cells (blue arrow) and hemosiderin-laden macrophages (red arrow). No cytological atypia is seen

as observed in the present case. The long duration of symptoms and lack of functional impairment are typical features.

Imaging plays an important role in pre-operative evaluation. Ultrasonography usually shows a well-defined hypoechoic or heteroechoic lesion, whereas MRI is the modality of choice for assessing lesion extent and relationship to adjacent structures [4,5]. However, imaging findings are not pathognomonic, and histopathological examination remains the gold standard for diagnosis.

The differential diagnosis of soft-tissue tumors of the foot includes fibroma of tendon sheath, ganglion cyst, pigmented villonodular synovitis, synovial sarcoma, and giant cell-rich lesions [9]. Histologically, fibroma of the tendon sheath lacks multinucleated giant cells and hemosiderin deposition, while malignant lesions show cytological atypia and increased mitotic activity, which were absent in the present case.

Complete surgical excision is the treatment of choice. The reported recurrence rate for localized GCTTS ranges from 4% to 20%, with higher rates associated with incomplete excision and diffuse type lesions [3,10,11]. Careful dissection and removal of the lesion, along with the involved tendon sheath reduces the risk of recurrence. In the present case, complete excision resulted in no recurrence at 6-month follow-up.

CONCLUSION

GCTTS should be considered in the differential diagnosis of long-standing soft-tissue swellings of the foot. A combined clinicoradiological and histopathological approach is essential for accurate diagnosis. Early surgical excision offers an excellent prognosis.

Clinical Message

Although rare in the foot, giant cell tumor of the tendon sheath should not be overlooked in chronic, painless soft-tissue swellings, and histopathological examination remains the gold standard for diagnosis.

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AUTHOR'S CONTRIBUTIONS

Dr. Shujaat Khan: Conceptualization, case documentation, histopathological evaluation, manuscript drafting, and final approval; Guarantor; Dr. (Brig.) Vinod Raghava: Overall supervision, critical intellectual input, and final approval; Dr. Dipiya Tikoo: Histopathological interpretation and critical manuscript revision; Dr. Shahnaz Parveen: Clinical correlation, literature review, and manuscript editing; Dr. Shweta Chaturvedi: Data acquisition, slide review, and microscopy analysis; Dr. Shashwat Joshi: Slide preparation, photomicrograph documentation, and literature support; Dr. Gagandeep Kaur: Photomicrograph documentation, Grossing Assistance and literature support.

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