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Case Report

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*Corresponding author

*Ana Ma Rayo Pérez, Degree in Podiatry from the University of Seville. Official Master's in Foot Surgery from the Catholic University of Murcia. Honorary Research Assistant in the Department of Podiatry at the University of Seville.

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A Big Synovioma in foot of unfrequent location. A Proposal of a Case

Ana Ma Rayo Pérez[1]*, Francisco Javier Rodríguez Castillo[2], Raquel García de la Peña[3]

[1]Degree in Podiatry from the University of Seville. Official Master's in Foot Surgery from the Catholic University of Murcia. Honorary Research Assistant in the Department of Podiatry at the University of Seville.

[2]Official Master's in New Care Trends in Health Sciences at the University of Seville. Honorary Research Assistant in the Department of Podiatry at the University of Seville.

[3]PhD from the University of Seville. Associate Professor in the Department of Podiatry at the University of Seville.

Abstract

Digital synovial is a soft tissue tumor that primarily affects adolescents and adults, with 30% of cases occurring in individuals under 20 years of age. It is found in the synovial sheaths of the fingers and toes and can impact the flexor and extensor tendons. These tumors are biphasic, featuring clefts lined with epithelioid cells and excessive mucin production, which can histologically resemble mucous cysts. Clinical diagnosis is challenging due to mild symptoms and general absence of pain unless the mass rubs against footwear, necessitating histological and imaging tests for confirmation. As a neoplasm, its treatment is surgical.

Introduction

Synovial sarcoma is a type of soft tissue tumor that predominantly affects adolescents and adults, with 30% of cases found in individuals younger than 20 years old. This tumor is known for its potential to invade surrounding tissues, commonly developing within the synovial sheaths of the fingers and toes, and can involve both flexor and extensor tendons (1,2).

From a histological perspective, synovial sarcomas are biphasic, featuring clefts lined with epithelioid cells and an overproduction of mucin, which can lead to confusion with mucous cysts during diagnosis (3). These tumors usually present with mild symptoms, making them challenging to identify. Typically, pain is not experienced unless the mass creates friction with footwear. Clinically, a well-defined, soft, and movable mass that gradually increases in size is often detected. Additionally, there may be a restricted range of motion in the affected finger (2,4,5).

Diagnosing synovial sarcoma involves a thorough review of the patient's medical history, a detailed physical examination, and the use of imaging studies. During the physical exam, the mass's size, shape, location, consistency, mobility, and relationship with nearby structures should be carefully evaluated. Ultrasound is typically the first imaging modality used, revealing a well-defined, mobile, anechoic mass associated with a tendon. MRI is essential for confirmation, showing the tumor as a well-defined mass that appears hypointense on T1-weighted images and hyperintense on T2-weighted images. A conclusive diagnosis is made through biopsy and histopathological analysis (1,3,6,7).

In terms of treatment, even though synovial sarcoma is benign, it requires complete surgical excision with clear margins. This involves making an incision

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appropriate to the lesion and carefully removing the tumor. After excision, a histopathological examination of the specimen is crucial (5,8,9).

The outlook for patients with synovial sarcoma is generally positive if the tumor is entirely removed. Recurrence is uncommon when complete excision with clear margins is achieved. However, if the excision is incomplete, there is a higher risk of recurrence, possibly necessitating additional surgical procedures (1,10).

Case Report

A 41-year-old patient with no relevant medical history or allergies attended the podiatry clinic in September 2023. He reported a gradually growing mass on the dorsum of his right foot, which prevented him from wearing certain types of footwear.

During the clinical examination, a well-defined, palpable, mobile and partially depressible mass was identified on the dorsum of the forefoot, in the lateral area at the level of the fourth metatarsal. The patient did not report pain on palpation or during movement of the toes (Illustration 1A).

The ultrasound examination revealed a well-defined, anechoic, dense and mobile mass associated with the extensor tendon of the fourth toe of the right foot. The mass measured 2.75 x 2.20 cm.

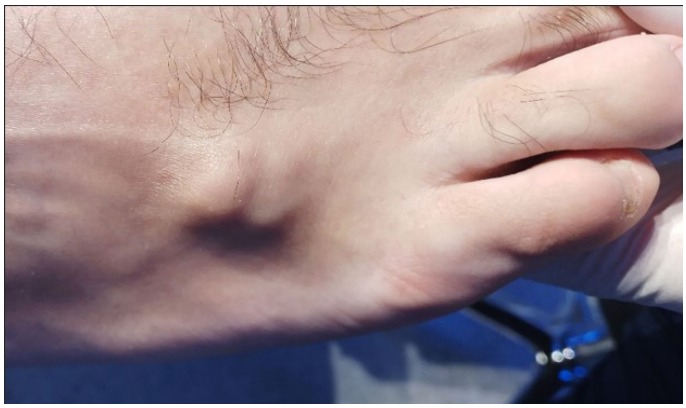

Figure 1: *Clinical Illustration*

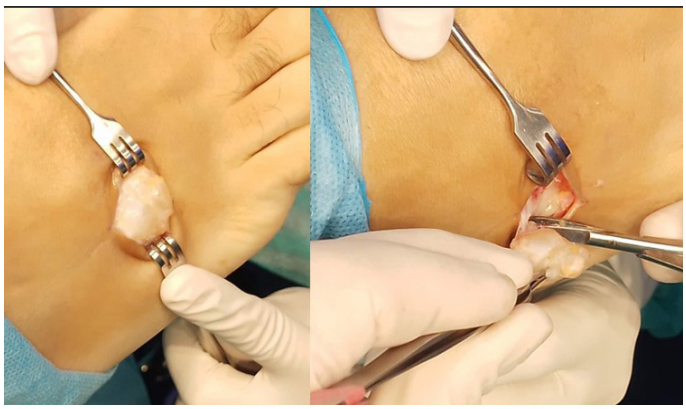

Figure 3: *Excision of Synovial*

During the initial podiatry consultation in February 2024, a fine needle aspiration biopsy was performed using a 14G needle (2.0 x 30 mm) to sample the contents of the mass. However, no results were obtained due to the high density of the contents. Consequently, it was decided to proceed with complete excision of the mass.

Subsequently, a surgical intervention was performed under local anesthesia on an outpatient basis in March 2024. First, a longitudinal incision was made on the third toe, slightly lateralized. Then, dissection by planes was conducted, taking special care not to rupture the tumor or damage adjacent nerve structures. Once the tumor was identified, it was excised (Illustration 3).

After the tumor was excised, the surgical site was thoroughly inspected to ensure that no remnants of the lesion were left behind. The wound was then closed using layered sutures, and a dry dressing was applied to the area. The patient was prescribed oral analgesics (Paracetamol, 1g every 8 hours for 5 days) along with prophylactic antibiotics (Azithromycin 500 mg, once daily for 3 days).

At the first follow-up appointment, which occurred seven days post-surgery, the surgical site appeared to be healing well, and the patient demonstrated a satisfactory range of motion in the third toe. A new dry dressing was applied. Fourteen days after the surgery, the sutures were removed, and another dry dressing was placed over the area. Starting 20 days post-surgery, the patient was advised to wear athletic shoes until the final follow-up, which took place one month after the operation. During the follow-up in September 2024, no complications were observed, leading to the patient's final discharge.

Histopathological analysis revealed a well-defined mass measuring 2.3 x 1.8 cm, composed of proliferating synovial cells, a myxoid matrix, and isolated areas of fibrosis.

Discussion

The term "cyst synovial" remains somewhat ambiguous and is often confused with ganglions or synovial cysts in the literature. A ganglion is defined as a protrusion of synovial fluid through a weakened area or rupture in the joint capsule, usually measuring between 3 to 6 mm in thickness. These are most commonly found in the hands, with approximately 65% of cases occurring in this location. As such, a synovial cyst is essentially a smaller ganglion. Both conditions are considered degenerative, reflecting underlying joint abnormalities (11–13).

Synovial sarcoma can develop in various locations, with the dorsal side of the wrist being the most frequent site, accounting for 60% of cases. This condition typically affects young adults and does not show a gender preference. Additionally, 15% of cases occur on the palmar side of the

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wrist, while 5% are found within the flexor tendon sheaths (9,10,14).

The exact cause of synovial sarcoma remains unclear, though some studies suggest a potential link to trauma in up to 19% of cases, while others associate it with chronic stress on connective tissue (15–17).

Recognized as a benign neoplasm, treatment strategies vary among different authors. For smaller lesions, some recommend localized triamcinolone injections, despite their high recurrence rate. However, most experts prefer surgical excision as the primary treatment, advocating for complete removal of the tumor with clear margins and careful dissection (1,2,17).

Recurrence of this condition is generally uncommon, particularly when excision is performed meticulously. Nonetheless, there is a reported risk of around 10% of cases progressing to synovial sarcoma, a rare malignant tumor that represents approximately 5% of all soft tissue tumors (6,10,18).

It is important to note that the literature on digital synovial tumors in the foot is limited, with most reports focusing on cases in the hand, often presented as case studies or expert opinions. This underscores the need for more comprehensive studies to further explore this clinical entity, aiming to enhance understanding of its etiology, diagnosis, and treatment.

Conclusion

Digital synovial tumors are rare benign neoplasms associated with the synovial sheath of flexor or extensor tendons. They typically present as a palpable, painless, and well-defined mass with slow growth. Diagnosis is based on a combination of clinical assessment, ultrasound imaging, and histological examination. The preferred treatment is complete excision due to the tumor's neoplastic nature.

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