Resection of acral fibromyxoma tumor at the digital tip and reconstruction with advancement flap. A case report

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Case Report

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Background: Acral fibromyxoma is a rare benign soft tissue tumor that usually develops in the periungual or subungual region of the digits. Although histologically benign, its infiltrative growth pattern and tendency for local recurrence require complete surgical excision with tumor-free margins. In digital tip lesions, this approach may result in tissue defects that compromise both functional and aesthetic outcomes. Local advancement flaps represent an optimal reconstructive option, providing tissue of similar thickness, color, and sensitivity, while minimizing donor site morbidity. Compared to skin grafts, local flaps allow for improved healing, preservation of the nail apparatus, and restoration of protective sensibility. The combination of complete surgical resection with local flap reconstruction ensures oncological safety, reduces recurrence risk, and enhances functional and cosmetic recovery. Therefore, this technique should be considered the first-line surgical strategy for the management of acral fibromyxoma in the digital tip.

Keywords: Acral fibromyxoma, Advancement flap, Digital reconstruction

Acral fibromyxoma (AMF), also known as digital fibromyxoma or superficial acral fibromyxoma, is a benign, slow-growing mesenchymal tumor with a predilection for the nail apparatus and the digital tips of the hands and feet. Clinically, it manifests as a painless, insidious, sub- or periungual nodule that can cause nail deformity and, in some cases, bone erosion due to pressure. It was initially described in 2001 and has since been established as a distinct entity, although it is frequently underdiagnosed in clinical surgical and dermatological practice [1,2,3,4].

Histopathologically, AMF is characterized by a poorly defined dermal proliferation of spindle and stellate cells embedded in a myxoid to fibromyxoid stroma, with delicate vasculature and the presence of mast cells [1,5]. Immunohistochemistry reveals intense expression of CD34 and, in some cases, EMA, and is negative for S100, desmin, and actin, which helps rule out tumors of neural or myofibroblastic origin [5]. Molecular studies have identified the loss of RB1 (13q14 deletion) as a recurrent finding, linking it to the group of soft tissue tumors associated with deletion of this gene [6,7]. Differential diagnoses include digital myxoid cyst, superficial angiomyxoma, myxoid neurothekeoma, neurofibroma, myxoid dermatofibrosarcoma protuberans, and giant cell tumor of the tendon sheath [3,8]. Peri/subungual location, diffuse positivity for CD34, and negativity for S100 and muscle markers usually guide the diagnosis of FMA. Imaging (X-ray or MRI) can demonstrate secondary bone involvement due to pressure, but confirmation is always histological [4,8].

The treatment of choice is complete surgical resection with clear margins, with the goal of preserving digital function and aesthetics. Local recurrence varies between 10–25%, especially in cases with positive margins or incomplete resections [2,9]. In lesions involving the nail bed, reconstruction with whole skin grafts or thin local flaps should be considered to preserve aesthetic and functional function [3,9,10]. Although the tumor may exhibit locally aggressive behavior, no cases with metastasis or malignant transformation have been reported to date [2].

For the plastic surgery resident, the key aspects are: (1) suspect AMF in chronic digital tip nodules or those with atypical nail deformity; (2) perform an adequate diagnostic resection that allows for complete histological and immunohistochemical evaluation; (3) discuss with pathology the usefulness of molecular studies of RB1 in doubtful cases; (4) plan reconstruction of the nail apparatus and digital coverage using conservative techniques; and (5) ensure prolonged clinical follow-up due to the risk of recurrence. The inclusion of FMA in the 2020 WHO

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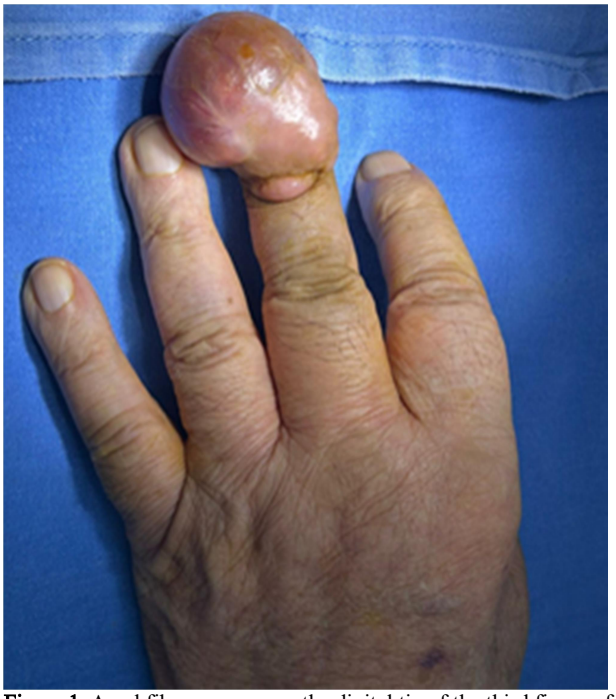

Figure 1. Acral fibromyxoma on the digital tip of the third finger of the left hand with accelerated growth after biopsy.

Classification of Soft Tissue Tumors within the fibroblastic/fibromyxoid spectrum reinforces its recognition and proper management in surgical practice [7,8].

Case report

We present the case of a 77-year-old male with no significant disease or previous surgical history. The only history of the tumor was a biopsy of a small tumor on the digital tip of the third finger of the left hand, which revealed acral fibromyxoma. Subsequently, the patient presented a significant increase in volume in this region over a period of 3 months (Figure 1). A protocol was established, and the tumor was resected. The surgical procedure revealed complete invasion of the germinal matrix, so its extraction was performed. It was decided to cover the defect with a local flap advancement and a splint with nail plate substitute in a sterile matrix. The flap was approached to ensure adequate vascularity and closed with simple 4/0 nylon sutures. (Figure 2) We can observe the complete extraction and the size of the tumor once removed. (Figure 3)

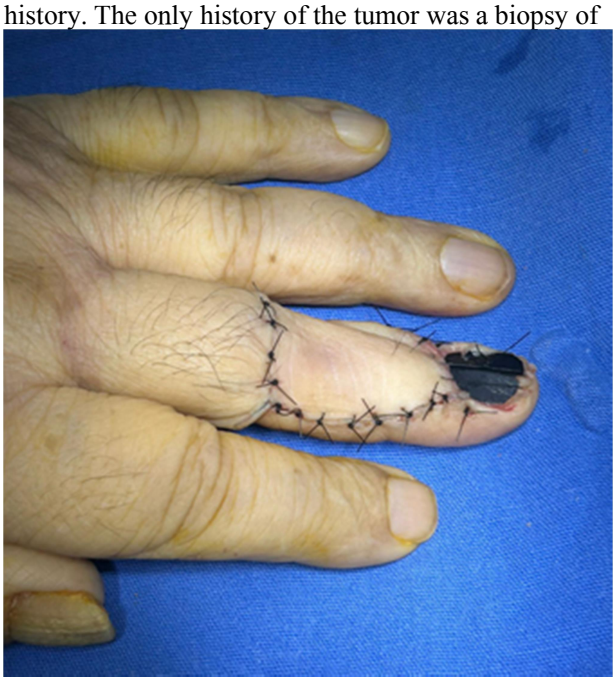

Figure 2. Local advancement flap, which is rotated with its pedicle on the ulnar side of the back of the third finger of the left hand. Tension-free closure and splint placement in the nail matrix.

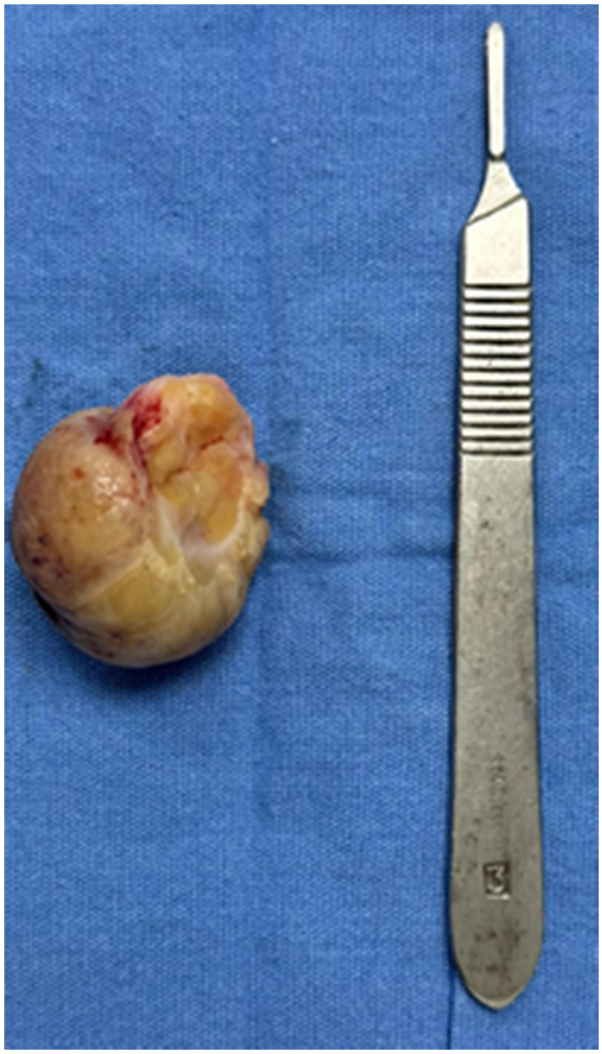

Figure 3. Tumor with complete resection of the digital tip compatible with an acral fibromyxoma according to the histopathology report.

Discussion

Digital acral fibromyxoma represents a diagnostic and therapeutic challenge for the plastic surgeon, given that its usual location in the fingertips

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and periungual region requires not only complete resection of the tumor but also the functional and aesthetic preservation of the nail apparatus. Surgical resection with oncologically safe margins is the treatment of choice and represents the only proven curative strategy [1,2]. However, due to the absence of a capsule and its tendency to infiltrate dermal tissue, obtaining clear margins can lead to considerable defects in critical areas of digital coverage [3,4].

The use of local advancement flaps is a highly useful reconstructive tool in this context. These flaps allow for the provision of neighboring tissue with similar characteristics in color, thickness, and sensitivity, promoting primary healing and reducing the risk of bone exposure or postoperative nail deformity [5]. Compared with skin grafts, local flaps provide better functional integration, less secondary contraction, and a more harmonious aesthetic result with the digital region [6].

In patients with residual defects following fibromyxoma resection, the choice of flap should be individualized according to the size, location, and nail bed involvement. Volar or lateral advancement flaps allow immediate coverage with a good prognosis for protective sensitivity and minimal morbidity at the donor site [7]. Furthermore, by ensuring adequate coverage of the nail bed, the architecture of the nail apparatus is preserved, reducing the risk of secondary dystrophies.

The literature describes recurrences of up to 25% related to incomplete resections [2,8]. Therefore, the combination of a controlled wide resection with a local advancement flap offers a doubly effective strategy: it ensures complete tumor removal with clear margins and provides immediate reconstruction with tissue of similar quality to native tissue. This contributes to a decrease in the recurrence rate and optimizes functional and aesthetic recovery at the fingertip.

Conclusion

Acral digital fibromyxoma, although benign, requires a meticulous surgical approach that balances oncological radicality with preservation of digital function. Complete resection with clear margins is the cornerstone of treatment, and when combined with reconstruction using local advancement flaps, a superior result is achieved in terms of coverage, aesthetics, and functionality. This strategy reduces complications resulting from wide resections, preserves nail architecture, and reduces the risk of recurrence, establishing itself as an ideal technique for the surgical management of benign tumors located at the fingertip.

Conflicts of interests

The authors have no conflicts of interests.

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