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SQUAMOUS CELL CARCINOMA ARISING IN CHRONIC LYMPHEDEMA OF THE RIGHT LOWER LIMB: A RARE CASE OF MARJOLIN'S ULCER IN A FILARIAL LIMB

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Abstract

Background: Marjolin's ulcer is a rare, aggressive malignancy developing in chronically inflamed or scarred tissues. While most often associated with burn scars, chronic lymphedema—particularly filarial—can also undergo malignant transformation.

Case Presentation: We present a 70-year-old male with a 30-year history of right lower limb filariasis who developed a chronic, non-healing ulcer over the dorsum of the foot. Histopathological examination confirmed well-differentiated squamous cell carcinoma. Considering the absence of lymph node involvement and the risks associated with below-knee amputation (BKA) in a filarial limb, the patient underwent forefoot amputation with fillet flap reconstruction.

Conclusion: This case emphasizes the feasibility of limb-preserving surgery in carefully selected patients with SCC arising in chronic lymphedema. The use of a fillet flap allowed optimal soft tissue coverage, avoided major amputation, and preserved ambulation.

INTRODUCTION

Marjolin's ulcer denotes malignant transformation, typically squamous cell carcinoma (SCC), within long-standing wounds or chronic inflammatory conditions. It is most commonly seen in burn scars, but has also been reported in pressure sores, venous ulcers, and—more rarely—in chronic lymphedema. In tropical countries, **filarial lymphedema is a common cause of chronic limb swelling**, often leading to tissue fibrosis, chronic inflammation, and impaired immune surveillance.

While below-knee amputation (BKA) is traditionally considered the standard of care for aggressive or large SCC of the foot, we report a unique case where a **forefoot amputation with fillet flap cover** was successfully used, allowing limb preservation in a functionally dependent elderly patient.

CASE PRESENTATION

A 70-year-old male presented with an 8-month history of a non-healing ulcer over the dorsum of the right foot, associated with purulent discharge for 3 months. He was a known case of right lower limb filariasis for the past 30 years, with chronic lymphedema and intermittent episodes of cellulitis.

Examination Findings:

- 6 × 7 cm ulcer over the dorsal foot with everted margins, tenderness, purulent discharge, bleeding, maggots
- Warmth extending to mid-leg
- No sensory loss or varicosities
- Restricted ankle mobility, no palpable inguinal nodes

Investigations:

- **Edge wedge biopsy**: Well to moderately differentiated SCC with keratin pearls, brisk mitoses, lymphoplasmacytic infiltrate
- **USG Inguinal region**: No lymphadenopathy

- **CT Foot**: Large soft tissue mass over forefoot with ulceration, periosteal reaction but no cortical erosion; calcified vessels consistent with filariasis; no gas formation or fluid collection

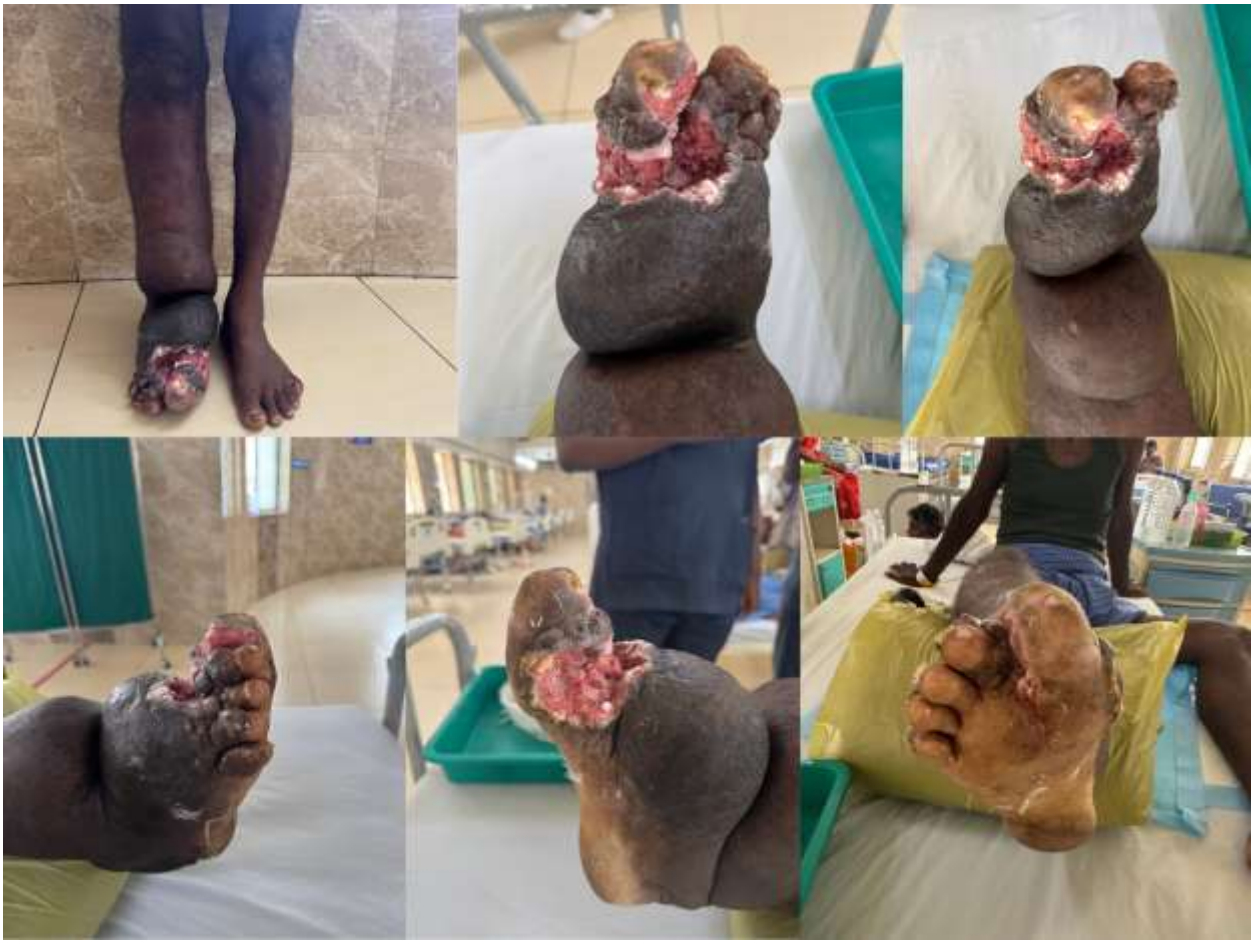

Figure 1: Clinical picture

Treatment

Given the localized nature of the tumor and absence of bony invasion or nodal spread, the patient underwent **forefoot amputation with fillet flap coverage**. The fillet flap, harvested from uninvolved plantar soft tissue, allowed tension-free coverage of the defect with good vascularity.

Figure 2: Forefoot amputation with 1cm margins around the ulcer

Figure 3: Primary closure with fillet flap

Histopathology of amputated specimen:

- Ulceroproliferative lesion (16 × 11 × 2.5 cm) with invasive, well-differentiated SCC
- Clear proximal skin, soft tissue, and bony margins
- No lymphovascular or perineural invasion
- Monckeberg's sclerosis noted in blood vessels (consistent with chronic lymphedema)

Adjuvant Treatment:

The patient received two cycles of chemotherapy with: **Paclitaxel 160 mg and Carboplatin 300 mg**

Outcome and Follow-Up

The patient recovered uneventfully and was independently ambulant without support at 3-month follow-up. There were no signs of recurrence or wound complications. The fillet flap remained viable and well-integrated.

Figure 4: Patient post 3 months follow up and ambulating

Discussion

Marjolin's ulcers are aggressive malignancies with a high rate of recurrence and metastasis. Chronic lymphedema—though a rarer precursor than burns—has been increasingly recognized as a risk factor for SCC, particularly in tropical regions with endemic filariasis. Few cases have been documented in the literature:

- **Yagi et al. (2000)** reported SCC in chronic lymphedema secondary to lymphatic obstruction, treated by wide excision and grafting.
- **Pahwa et al. (2011)** described a case of SCC in a filarial limb that required below-knee amputation.
- **Pezzeshki et al. (2020)** highlighted the diagnostic delay and poor prognosis associated with malignancies in lymphedematous limbs.

In most reported cases, **BKA is often the treatment of choice** to ensure oncologic clearance due to frequent nodal involvement and deep infiltration. However, in our case, **multiple factors guided us towards a conservative, function-preserving approach**:

1. **No Lymph Node Involvement:**

Clinical and ultrasonographic examination of bilateral inguinal nodes showed no evidence of lymphadenopathy. This could be attributed to **chronic lymphatic obstruction from filariasis**, which **masks or impedes typical lymphatic spread**, leading to falsely negative nodal status. This has been previously observed in similar cases from endemic regions.

2. **Localized Tumor Without Bone Invasion:**
   Imaging (CT foot) showed no cortical erosion or significant bony involvement, with tumor margins confined to the soft tissue of the forefoot.
3. **High Morbidity of BKA in a Filarial Limb:**
   Below-knee amputation in an already fibrotic, edematous, and poorly vascularized limb would have resulted in significant **wound healing challenges, delayed rehabilitation, and long-term disability**. Given the **advanced age of the patient and his dependency on daily ambulation**, we prioritized a **functionally optimal outcome**.
4. **Excellent Postoperative Recovery:**
   The patient achieved pain-free, unassisted ambulation post-forefoot amputation and tolerated adjuvant chemotherapy well. Histopathology confirmed **clear proximalmargins**, validating the adequacy of local excision.
5. **Use of Fillet Flap**: Allowed **oncologically sound resection** with primary soft tissue coverage using the patient's own non-functional tissue—**avoiding donor site morbidity and preserving limb contour and balance**.
   This case illustrates that **in carefully selected patients**, forefoot amputation offers an **oncologically sound yet limb-preserving** alternative to BKA. Additionally, our case adds to the growing body of evidence suggesting that **Marjolin's ulcers in filarial limbs may have atypical lymphatic spread patterns**, warranting individualized management strategies. Compared to prior cases requiring major amputation, our approach achieved **clear surgical margins** and preserved ambulation, emphasizing that **forefoot amputation with fillet flap is a viable alternative in select patients** with SCC of the foot.

CONCLUSION

Squamous cell carcinoma developing in a chronically lymphedematous limb, particularly due to filariasis, represents a rare and challenging clinical entity. This case emphasizes the importance of maintaining a high index of suspicion for malignant transformation in long-standing, non-healing ulcers, especially in endemic regions. While below-knee amputation is often considered the standard surgical approach for foot malignancies, our case demonstrates that, in carefully selected patients with localized disease and no radiological or pathological evidence of nodal or bony involvement, **forefoot amputation with fillet flap reconstruction can provide an oncologically safe and functionally superior alternative**. This limb-sparing approach allowed early mobilization, preserved independence, and minimized morbidity in an elderly patient, underscoring the value of individualized, patient-centered surgical decision-making in complex oncologic scenarios.

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