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Fillet Flap For Non-Healing Ulcer Of Foot Revisited

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I. Background

Tissue from amputated or nonsalvageable limbs can be utilized for reconstructing complex defects resulting from tumors and trauma, embodying the "spare parts" concept. Fillet flaps, defined as axial-pattern flaps capable of functioning as composite-tissue transfers, can be applied as either pedicled or free flaps. They serve as a valuable reconstruction strategy for significant defects, provided there is adjacent tissue available.

Toes are particularly susceptible to ischemia due to their limited vascular supply and exposure to continuous trauma from activities like standing and walking, especially when wearing tight shoes. Individuals with risk factors for vascular compromise—such as diabetes, peripheral vascular disease, trauma, infection, and tumors—are especially at risk for toe necrosis. Various medical approaches exist for managing skin and soft tissue necrosis in the toes, tailored to the cause and extent of the necrosis. Amputation is often a fundamental treatment to halt ongoing necrosis by removing the affected tissue. After amputation, several methods can be employed to cover defects, including local flap coverage, skin grafts, and free tissue transfer. Toe fillet local flap coverage is considered an ideal surgical method due to its excellent outcomes and minimal donor site morbidity.

The core principle of traditional toe reconstruction involves amputation followed by local flap coverage, aiming to preserve as much bone and soft tissue as possible to prevent adjacent toes from collapsing into the void left by the amputation. It is intuitive that retaining a longer portion of the toe yields better functional and aesthetic results. The well-known terminal Syme's amputation procedure aligns with this concept, aiming to preserve maximum toe length and commonly used in clinical settings. However, a significant drawback of this technique is the risk of poor wound healing, often caused by tension around the wound margins due to insufficient bone resection.

II. Case Report

A 69 year old woman with a history of diabetes presented to our institution with a 2 year history of non-healing ulcer on the medial aspect of Great toe (Figure 1). The patient was earlier managed by antiseptic dressing without any significant improvement. On physical examination the wound was located on the medial aspect of head of the first metatarsal and measured 2 x 2 cm in size. The second toe to fifth digit seemed normal with no signs of infections or ulcers. Dorsalis pedis was palpable. Active toe movements were present. With other routine laboratory tests we also did an Xray of the foot.

The Xray report were suggestive of Osteomyelitis in the Metatarsal head of great toe (figure 3). Amputation of the great toe (proximal 1/3rd of metatarsal) was performed. The medial soft tissue and skin were elevated and the bony phalanges were filleted out from the skin, with careful preservation of the neurovascular bundle. The fillet flap demonstrated excellent vascularity (figure 4). It was then used to cover the area of amputated great toe and ulcer (figure 5). Post operatively tissue was sent for culture and demonstrated pseudomonas aeruginosa. The wound was examined on 5th postoperative day to rule out any signs of necrosis, dehiscence or infection, The wound healing was uneventful and the sutured were removed after 2 weeks.

Figure 1 Non-healing Ulcer

Figure 2 Incision for fillet flap

Figure 3 Xray - Suggestive of osteomyelitis in first metatarsal head

Figure 4 Post-Amputation

Figure 5 Post-operative

Table 1 Aerobic Culture Report

Microorganism Isolated : Pseudomonas Aeruginosa

ANTIBIOTIC	SENSITIVITY	MIC VALUE
Piperacillin/Tazobactam	Sensitive	16
Amikacin	Sensitive	4
Gentamicin	Sensitive	<=1
Ceftazidime	Sensitive	2
Cefepime	Sensitive	8
Ciprofloxacin	Sensitive	0.25
Levofloxacin	Sensitive	0.5
Imipenem	Sensitive	2
Meropenem	Sensitive	0.5
Colistin	Sensitive	<=0.5

III. Conclusion

This case report describes the surgical technique of great toe fillet flap for wound closure. The advantages of this technique include good soft tissue durability and preventing the need for more proximal amputation for adequate soft tissue coverage. The consistent presence of an axial vessel makes the fillet flap a reliable local flap to be used in specific circumstances where the loss of a toe is unavoidable.

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