

**EP-218**

**절단 위기 수준의 괴사성 근막염에서  
수술실 중심의 고빈도 처치 및 단계적  
재건을 통한 구제 전략: 3례 증례  
분석과 치료 알고리즘 제안**

Structured High-Frequency Operating Room-Based Salvage Strategy for Limb-Threatening Necrotizing Fasciitis: A Three-Case Series and Treatment Algorithm



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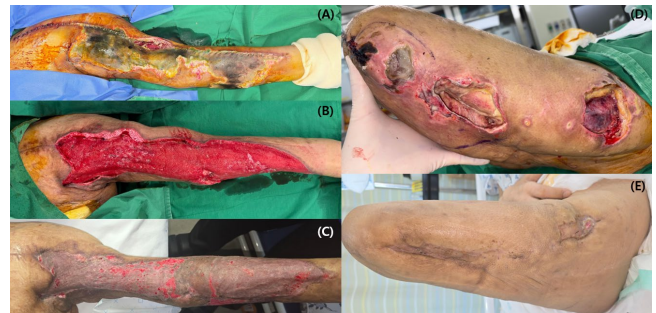
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**Purpose:** Necrotizing fasciitis (NF) in high-risk patients often necessitates proximal amputation. Current clinical standards lack structured guidance on the precise intensity and frequency of surgical interventions required for limb salvage. We propose a "Structured High-Frequency Operating Room (OR)-based Salvage Strategy" to prevent premature or excessive amputation.

**Methods:** We report three high-risk diabetic patients (one upper extremity, two lower extremities) with limb-threatening NF who were initially advised to undergo amputation. Our protocol involved: 1) Proactive OR-based debridement every 48–72 hours; 2) Serial culture-driven antimicrobial adaptation; and 3) Staged decision-tree-based reconstruction timing. Patients underwent 19–23 OR-based interventions for radical irrigation, debridement, and wound control. Definitive reconstruction was performed using acellular dermal matrix (DM) and split-thickness skin grafting once objective infection control criteria were met.

**Results:** Despite extensive tissue loss and impaired healing capacity, stable granulation beds were achieved in all cases. Complete limb salvage was achieved in Cases 1 and 2, including the anatomically vulnerable Achilles' area. In Case 3, where an above-knee amputation was pre-determined prior to plastic surgery intervention, the protocol effectively halted proximal infection spread toward the high-femur level, successfully salvaging a functional stump for rehabilitation. All cases achieved stable epithelialization within 4–6 months without recurrence.

**Conclusion:** In selected diabetic patients with severe NF, a structured, high-frequency OR-based salvage algorithm may prevent premature amputation. Persistent but criteria-driven operative management combined with adaptive antimicrobial therapy can enable limb preservation even in cases initially deemed unsalvageable.



**Fig. 1.** (A) Initial radical debridement performed upon transfer of case 1. Despite 10 days of prior antibiotic therapy at a secondary hospital, deep tissue necrosis was evident. (B) Pre-reconstructive state just before skin graft. (C) Follow-up image 1 day after the final operating room (OR) visit, demonstrating successful wound epithelialization. (D) Initial presentation of case 2 to the Department of Plastic Surgery following an above-knee (AK) amputation by Orthopedic Surgery. All wounds were found to be communicating with each other. (E) One-month follow-up showing complete epithelialization and a functional stump.

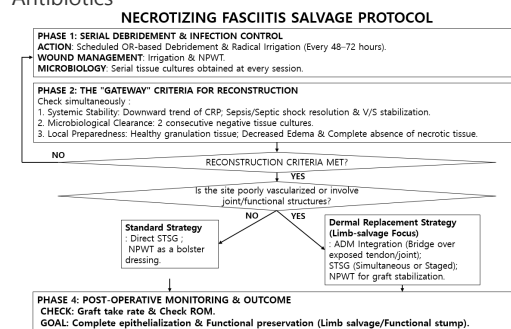


**Fig. 2.** (A) Initial radical debridement of figure 3, involving the entire lower leg and the lateral aspect of the thigh. (B) Appearance one month after the initial OR visit. (C) Final follow-up one month after reconstruction, showing complete epithelialization and successful prevention of proximal extension.

Category	Parameter	Case 1 (Shoulder)	Case 2 (Lower Leg)	Case 3 (Thigh Stump)
Demographics	Age / Sex	39 / M	58 / M	54 / M
	Key Conditions	Humerus Fx, DM	T-SAH, Multiple Trauma, DM	HF/rEF, ESRD on HD, DM, HTN
Severity at Admission	Peak CRP (mg/L)	66.3 (Pre-treated)	280.6 (PTD5)	310.0 (HD3)
	Septic Shock	No	Yes (Inotropes +)	Yes (Inotropes +)
	ICU Admission	No	Yes	Yes
Microbiology	Osteomyelitis	Yes (humerus)	No	Yes (lower leg)
	Primary Pathogen	Mixed / MRSA	Aeromonas hydrophila	ESBL E. coli
Initial Proposal	Reason for Amputation	Refractory to 10d+ Abt, Multi-level joint involvement	Circumferential involvement, Achilles exposure	Life-threatening shock
	Surgical Intensity	Total OR-based I&D	23 sessions	20 sessions
Outcome	Final Status	Limb Salvage Functional-free on elbow, wrist and hand	Limb Salvage Functional-free on whole levels of Lt. Lower extremity	Functional Stump Salvage

**Fig. 3.** Overall view of the whole cases.

\*Fx : Fracture, \*DM : Diabetes Mellitus, \*T-SAH : Traumatic subarachnoid hemorrhage, \*HF/rEF : Heart failure with reduced ejection fraction, \*ESRD : End stage renal disease, \*HTN : Hypertension, \*PTD : Post-trauma day, \*HD : Hospital day, \*Abt : Antibiotics



**Fig. 4.** Algorithm tree of necrotizing fasciitis treatment.

\*OR : Operation room, \*NPWT : Negative pressure wound therapy, \*STSG : Split thickness skin graft, \*ADM : Acellular dermal matrix, \*ROM : Range of motion