

Complex lower extremity wound cases with exposed hardware and their management with application of skin substitute and negative pressure wound therapy: Case Series

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Introduction

Surgical wounds with exposed hardware is a perpetual concern and challenge for any surgeon. Infection involving internal hardware can jeopardize bone healing and result in lifelong issues with bone infection, limb loss or death. When hardware is prematurely removed, complications arise if the fracture or osteotomy sites have not adequately healed rendering instability and loss of correction. The five cases presented as a case series highlight patients who recently underwent surgery and developed wound complications and exposure of internal fixation post operatively. Each case demonstrates various approaches for successful wound management without hardware removal.

Methods

Four patients with recent midfoot arthrodesis procedures sustained wound dehiscence and soft tissue loss (secondary to mechanical fall, inappropriate wound management in Skilled Nursing Facility (SNF), and below knee cast getting wet) leading to deep wounds with exposed hardware. The fifth patient underwent initial deformity correction with external fixation prior to definitive internal fixation. Due to recent surgery, hardware removal was not appropriate as it would lead to instability and loss of correction across osteotomy sites. Each patient underwent aggressive treatment with appropriate antibiotic therapy, wound debridement, application of skin substitute and application of continuous negative pressure wound therapy (NPWT) at 125 mmHg.

Results

Case 1	Case 2	Case 3	Case 4	Case 5
				
				
				

Discussion

All wounds healed within 4-8 weeks depending on the extent of initial soft tissue loss. In each case infection was detected and immediate treatment initiated, including surgical debridement and deep wound cultures to aid with antibiotic coverage in liaising with the Infectious Diseases department. Multiple applications of skin substitutes (a fish skin graft was used in this case series) assisted with immediate coverage over exposed hardware and initiation of NPWT assisted with promotion of granulation tissue formation and rapid wound closure. None of the patients required further surgery for residual infection.

The standard for infection management (I&D/debridement, thorough irrigation and removal of hardware) has been routinely implemented for decades. Contrary to previous standard of care, this case series showcases that salvage of hardware is possible with early, aggressive management.^{1,2} This includes appropriate antibiotic coverage, thorough irrigation and debridement while incorporating advanced wound modalities such as NPWT that ensures set pressure is maintained at the wound bed^{3,4} and application of skin substitutes for rapid healing.⁵ Appropriate infection management was achieved without the need for removal of hardware or limb loss in each case presented.

References

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