

Non-operative Management of Surgical Wound Dehiscence Following Knee Fusion: A Multimodality Approach

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Abstract

Introduction

The potential morbidity following total knee arthroplasty cannot be understated. Wound complications can range from simple, superficial erythema to deep wound infection with complete dehiscence and exposure of the surgical hardware. Periprosthetic joint infections (PJI) have an incidence of 1-2.4% oftentimes accompanied by complications including skin necrosis, wound dehiscence, and the need for rehospitalization and reoperation. We present a case of a patient who underwent a total of 11 surgeries to the right knee. The index surgery was a total knee arthroplasty for end-stage osteoarthritis. Subsequent surgeries included revisions and washouts for persistent infection with the patient ultimately requiring a knee fusion which subsequently developed a significant wound dehiscence.

Methods

Utilizing multiple advanced wound healing modalities, our team was able to achieve complete wound closure over the course of three months in the outpatient setting. These techniques were employed during weekly and biweekly advanced wound clinic visits and included: negative pressure wound therapy (NPWT), serial sharp debridement, enzymatic debridement, chemical cauterization, oral and intravenous antibiotics, multiple animal-based collagen products, non-contact, low-frequency ultrasound, and compression therapy.

Results

The outcome of complete wound closure was truly life-altering for this patient as they were advised that an above the knee amputation would be the necessary alternative if we were unable to achieve wound closure. For perspective, the largest wound dimensions were 17.0cm x 4.0cm x 1.5cm.

Discussion

It is generally accepted that operative management is required for periprosthetic knee infections with associated wound dehiscence. We present a potential, non-operative alternative in the carefully selected patient under close observation with frequent follow up in an advanced wound clinic.

Case Presentation

71 year-old male

SIGNIFICANT HISTORY:

- End stage osteoarthritis
- Prediabetes
- Hyperlipidemia
- Gout
- 11 Right Knee Surgeries

WOUND HISTORY:

Initial surgery was a right total knee arthroplasty for end stage osteoarthritis in 2020. Post-operative course was complicated by recurrent infections requiring a number of procedures including: incision and drainage, liner exchange, explantation, antibiotic spacer placement, washouts, reimplantation, muscle flaps, split thickness skin grafts, etc. After three years of treatment and procedures, the patient was ultimately offered a right knee fusion with bone allografting with the understanding that further complications would likely require an above knee amputation. Referral made to wound center approximately three weeks post operatively.



Treatment Course

Initial treatment (3/15/23) consisted of NPWT and compression in an effort to minimize soft tissue loss and decongest the periwound along with an extended course of intravenous antibiotics followed by oral therapy and frequent monitoring by our infectious disease colleagues. The patient was followed twice weekly throughout the duration of the treatment in the outpatient wound center in addition to periodic examinations by our orthopedic colleagues. Noncontact, low-frequency ultrasound was utilized at each visit. As it became clear that the superficial layers were non-viable, sharp debridement was performed (3/24/23, 4/4/23) to aid in the formation of granulation tissue (4/19/23). Following several weeks of successful negative pressure and removal of necrotic tissue, we used a number of collagen-based products on the wound bed to assist with scaffolding. At several points, curettage and use of silver nitrate was necessary to treat hypergranulation tissue. As healing continued, we were able to discontinue NPWT allowing for more frequent application of the collagen-based products (5/9/23, 5/25/23). We continued with consistent compression therapy and noncontact, low-frequency ultrasound.

Following three months of intensive, outpatient therapy, the patient's R knee incision was successfully closed, thus avoiding an above knee amputation. Of note, at approximately 10 months following discharge from clinic, the incision remains intact and the patient is ambulating with minimal use of a rolling walker.



Key Points

- Close communication with referring specialists / consultants
- Frequent clinic visits
- Appropriate sharp debridement
- Adequate compression
- Patient education and engagement for buy-in and improved compliance

Acknowledgements

We would like to thank the invaluable members of the Miami VA Wound Team, Davis Cheung, RN, CWS, and Theresa Hernandez, RN, CWOCN for their care and expertise.

References

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