

INTRODUCTION

There is a scarcity of podiatric literature regarding specific treatment protocols for exposed hardware in the lower extremity. Consequently, the foot and ankle surgeon must manage these patients from experience and with intuition while considering several aspects of the patient scenario. We offer a case presentation with review of literature regarding protocol for instances of exposed hardware in the lower extremity.

A retrospective observational chart analysis was performed. In the scarce literature that exists pertaining to exposed hardware little has been shown regarding its incidence, risk factors or overall prognostic value of interventions and follow-up.

LITERATURE REVIEW

Much of what we know and utilize regarding the incidence and treatment of exposed and infected hardware stems from the complications of prosthetic implants of the hip and knee joints which derives from a paucity of literature for specifics related to hardware involvement. Many subscribe to the notion that similar principles apply between hardware, devices and treatment regimens across all specialties, be it with the use of pins, rods, plates, screws or prosthetic implants.

Zimmerli et. al¹⁹ discussed the viability of internal hardware and formulated a selection process for debridement with retention of hardware in patients with total hip or knee prostheses and advocated that symptoms or hardware exposure be less than three weeks old, the hardware must be stable and without a sinus tract and have positive susceptibility to antibiotics against surface-adhering microbes.

Permanent explantation is utilized either when there exists a limitation secondary to poor bone quality, insufficient soft tissue coverage, presence of highly resistant organisms, or when sufficient integrity exists such that the hardware may be removed without compromise.

Hardware replacement may be performed either as a one or two staged approach. Rudelli showed an 87.5% success rate following one-stage replacement of infected total hip arthroplasties with bone graft in 32 patients with a mean follow up of 103 months¹².

The two-stage hardware replacement yields an 86-95% success rate^{4,12,16}. This has widely become considered the “gold standard” for prosthetic hardware infection.

Puhto et. al¹⁰ advocated six weeks of antibiotic therapy between staged reimplantation in total knee arthroplasties.

CASE REPORT

Presentation: 75 year old male with a PMH of DM Type 2, HTN, CAD with stent placement and Hypothyroidism presented to the ED with several weeks complaint of redness, swelling and drainage to the left foot at the site of previous Charcot arthrodesis with now purulent drainage and visible internal hardware within the wound base.



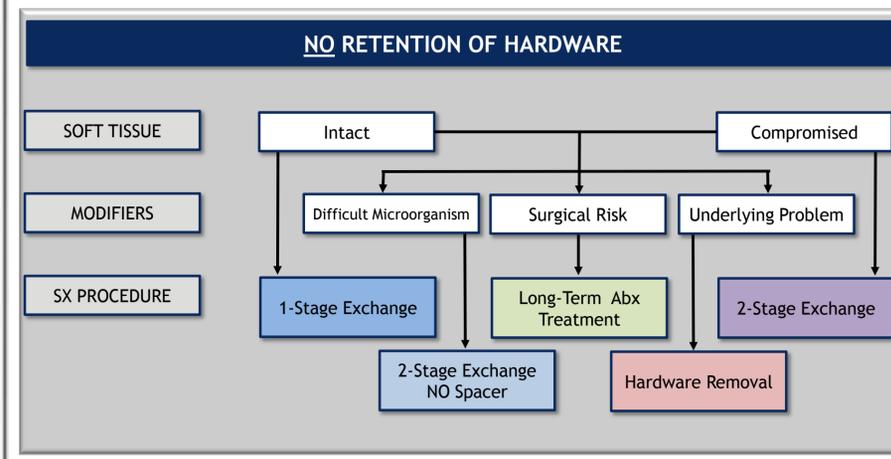
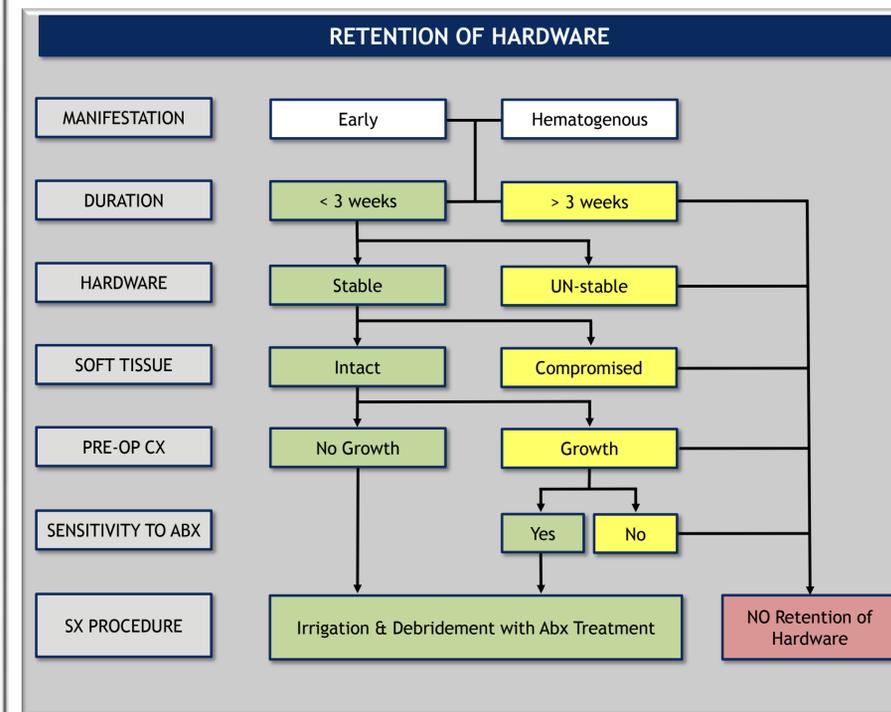
Consultation: Obtained with Infectious Disease, Vascular Surgery, and Orthopedic Surgery, who began empiric antibiotic therapy, performed angiography which confirmed three vessel patency to the foot, and evaluated the integrity of the exposed hardware as well as the fusion sites, respectively.

OR: Surgical debridement with complete explantation of all internal hardware was performed. Bone and tissue cultures were taken intraoperatively. Delayed primary closure was performed and the patient was placed non-weight bearing in a posterior splint dressing.

Post Operative: Four successive weekly total contact casts (TCC) were placed after which time, skin sutures and staples were removed in total and the patient was placed full weight bearing in a controlled ankle motion (CAM) walker with light sterile dressing atop his incision. 10 weeks after initial presentation the patient was completely healed.



TREATMENT ALGORITHM



CONCLUSION

Any presentation of exposed internal hardware can be a belabored and costly process both for the patient and clinician, alike. Although an empiric strategy often dictates initial treatments guided by the overall health of the patient, bone, soft tissues and hardware with consideration for pathogens, it becomes even more critical to establish and respect steadfast guidelines in order to ensure the best possible outcomes.

Although we recommend a multi-disciplinary approach to instances of exposed hardware with a superfluity of wound healing options including serial debridement, negative wound pressure therapy and serial total contact casting, there remains a need for large, long-term, randomized, prospective studies to both establish incidence likened to that of our orthopedic cohorts and to aide in determination of a reliable and reproducible protocol for the podiatric surgeon to best treat these patients.

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