

STATEMENT OF PURPOSE

Primary aim: A Case Report with the aim to highlight the first known documented patient with a successful definitive *entire* midfoot antibiotic spacer.

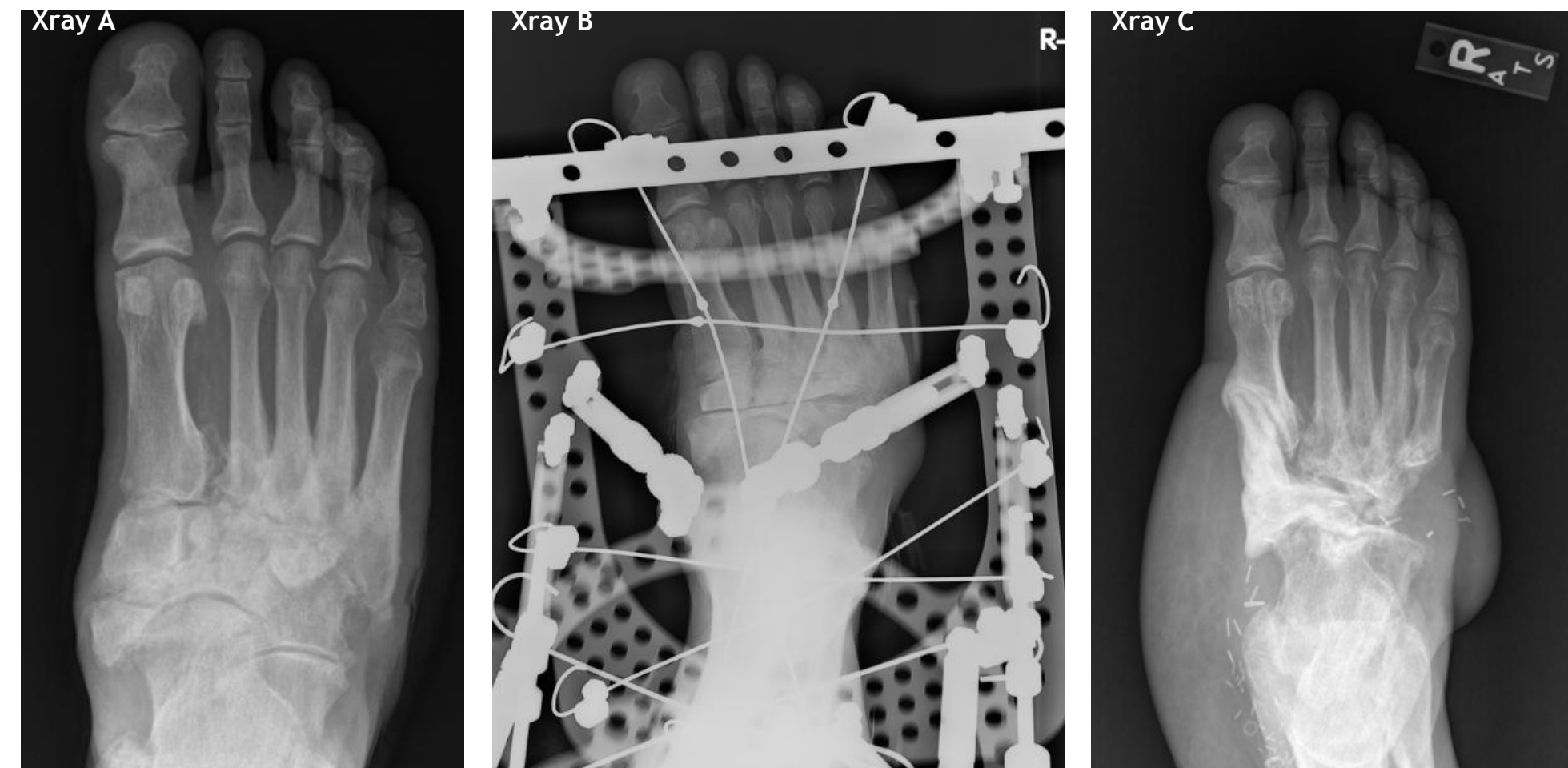
LITERATURE REVIEW

Antibiotic spacers, usually comprised of polymethylmethacrylate (PMMA), are commonly utilized in lower extremity to fill osseous voids secondary to infection and deliver local antibiotics to the surrounding tissues. Historically, most cases involve temporary insertion of an antibiotic spacer, stabilized by external or internal fixation, then removed and filled with autogenous or allogenic bone graft (Reiner et al, Miller et al). However, in a high risk patient, exchange for hardware may not be prudent. There have been reports on the long term use of cement spacers in infected total hip and total shoulder replacements (Ferrao et al) but extremely limited documentation on retained antibiotic spacers in the infected foot.

Hong et al present a case report of an ambulatory patient with definitive antibiotic spacer with no open wounds at 2 year follow up. Elmarsafi et al presented a patient at 38 month follow up with a successfully retained medial column antibiotic spacer after free tissue transfer. The only known multi-patient study is a retrospective review also by Elmarsafi et al in 2017. This review evaluated 30 patients who underwent placement of a permanent antibiotic-eluting cement spacer. Ten patients experienced spacer failure requiring removal and 20 patients had successfully retained spacers, with the longest retained spacer at latest follow up being 76 months.

The loss of skeletal integrity after resection of infected bone causes biomechanical compromise due to new unbalanced weight distribution, leading to increased pressures on an already at risk foot. These functional consequences create challenges in further limb salvage efforts. In the proper patient, as shown through this case study, the use of PMMA cement spacers can provide a viable long term reconstructive option in the effort to delay or prevent major lower extremity amputation.

IMAGES



Xray A: Weight bearing pre-operative DP radiograph. Xray B: Midfoot wedge resection with external fixator placement on 1/14/15. Xray C: Weight bearing Xray at 15 months post-operatively



Image A: Intra-operative image of ALT free tissue transfer to cover defect overlying antibiotic cement spacer. Image B: Final clinical photo at 15 months post-operatively with no pre-ulcerative lesions. Image C: Photograph of patient's custom shoes with no assistive devices needed for ambulation.

CASE REPORT

Case Report: One patient underwent Charcot reconstruction complicated by midfoot osteomyelitis requiring multiple operations for infection clearance and closure. The final construct resulted in a definitive spacer replacing the navicular, cuboid, all cuneiforms and first metatarsal base as the sole structure connecting the rearfoot and forefoot.

HPI: 60M presents on 1/24/13 for evaluation of right lateral foot wound that began as a blister in October 2012. Patient recently discharged home from OSH w/ Ancef TID via picc and VNA; hospitalized for treatment of right foot osteomyelitis.

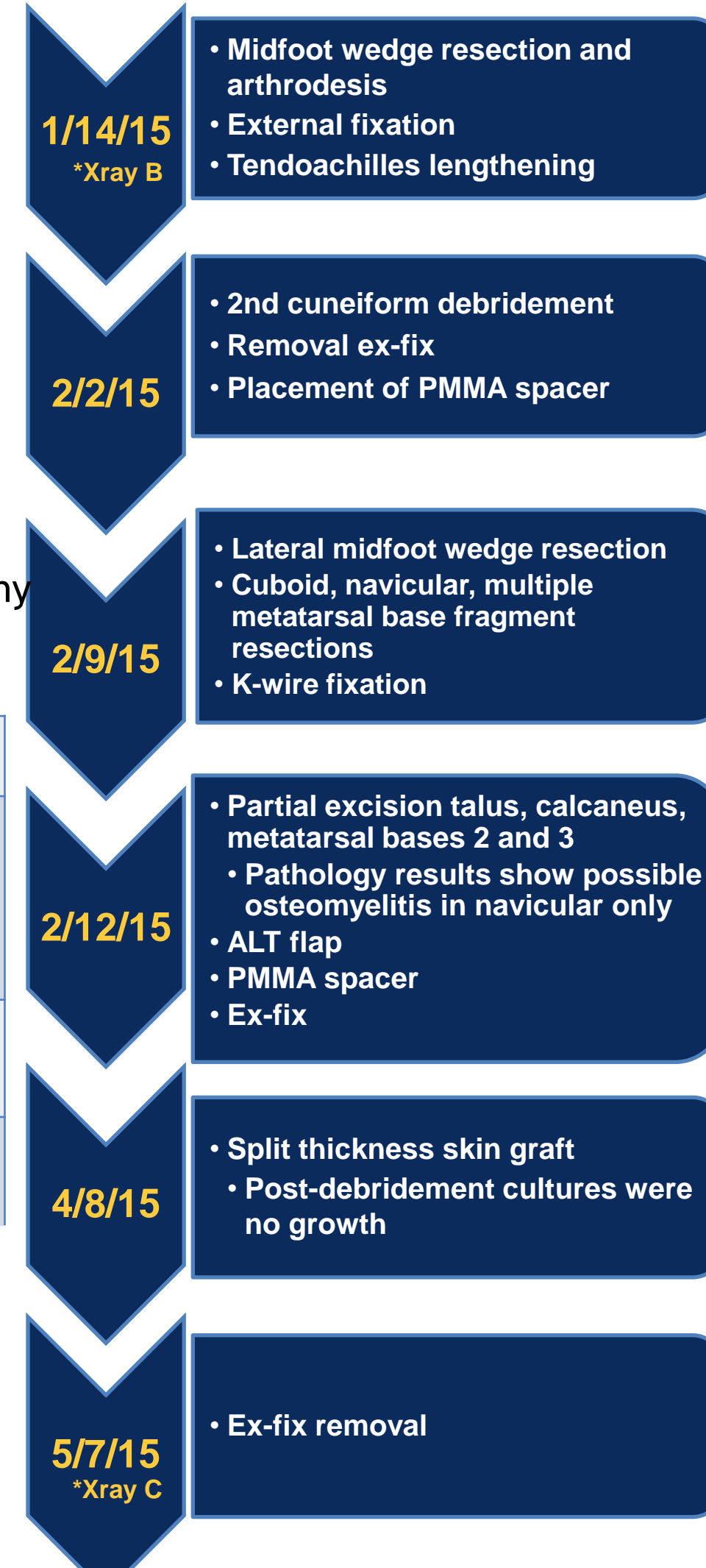
- PMH:**
- Type II Diabetes (most recent HbA1c 7.1%)
 - Hyperlipidemia
 - Charcot
 - Hypertension
 - Neuroarthropathy

Initial Physical Exam:

Vasc	No evidence of ischemia
Skin	Wound to plantar midfoot 4.0 x 2.8 x 0.3cm, moderate drainage, fibrogranular base
Neuro	Loss of protective sensation
Msk	Pes planus/charcot foot type

Notable Procedures: see right

Results: Fully ambulatory patient in custom shoes with no assistive devices and no skin breakdown at 17 month follow up after permanent midfoot spacer.



ANALYSIS AND DISCUSSION

When establishing a stable plantigrade functional foot, final constructs involving bone graft and internal hardware may not be prudent in patients with recent osteomyelitis and high risk of infection and limb loss, such as the patient in this report. Midfoot resection, secondary to osteomyelitis from failed Charcot reconstruction, in this patient with multiple comorbidities would often result in a major lower extremity amputation. With the ultimate goal of limb salvage, podiatric surgeons have a vast array of surgical tools and approaches available to provide the best outcome for the patient. This patient underwent multiple procedures including extensive bone resection, external fixator placement, free tissue transfer, skin grafting and multiple cement spacer exchanges.

The antibiotic cement spacer has added benefits of eluting antibiotics after osteomyelitis resection and fills the bone void, returning integrity to the foot. Biomechanically, a permanent midfoot-spanning cement spacer may not seem to be a viable option for reconstruction. However, if care is taken to ensure proper fit, shape and size of the spacer as to decrease any high pressure areas that could lead to new ulcer formation (Elmarsafi et al), patients can retain these spacers for extended periods of time and live many years with a functional limb. This case describes the first known documented patient with a successful definitive *entire* midfoot antibiotic spacer, illustrating that a retained antibiotic spacer is a viable reconstructive tool for surgeons to consider in complicated patients. At the 17 month follow up, the patient is fully ambulatory in custom shoes with no assistive devices or skin breakdown.

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