



## Antibiotic-loaded cement: A viable alternative to amputation in the treatment of diabetic foot osteomyelitis - A case report

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### Abstract

This article shows the long-term success of surgical debridement and antibiotic-loaded cement spacers, as an alternative to amputation, in a 32-year-old male diabetic Type I patient with Osteomyelitis (OM) of first metatarsal base and medial cuneiform of the left foot. OM is a common complication of diabetic foot infections and when it involves the proximal phalanx or metatarsal head, amputation at the Lisfranc ligament level is the recommended treatment. However, its management is not well standardized yet. The objective of this article is to describe the treatment with bone curettage and filling with antibiotic-loaded cement and its mid-term clinical outcomes, as an alternative to usual management. Local antibiotic treatment with cement could be equally effective as amputation without the morbid and functional implications that the latter option entails, nevertheless more evidence is required to develop general recommendations.

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### Introduction

The prevalence of diabetic foot OM has been estimated at 23.5% in outpatient settings and 66% in hospitalized patients [1]. Additionally, it globally affects the forefoot more frequently (90%), followed by the midfoot (5%) and the hindfoot (5%) [2]. The therapeutic objectives in this condition are infection resolution and restoration of limb functionality, this objective is reached mainly through surgery, long-term systemic antibiotics and physical therapy.

Surgical treatment involves debridement of devitalized tissues, irrigation, and bone resection with infection-free margins [2], the intervention could also include management of dead space and wound, bone stabilization, and bone grafting in the case of large bone defects. This procedure may impact foot mechanics, often necessitating amputations at various functional levels of the limb [3]. The risk of amputation above the ankle is

significantly higher when OM is present in the hindfoot (50%) compared to the midfoot (18.5%) and the forefoot (0.33%) [2]. Often, after surgery patients have to go through a long rehabilitation process because of the change in the foot structure. Some alternative techniques have been described, but the most used one seems to be the amputation. The objective of this article is to describe the treatment with bone curettage and filling with antibiotic-loaded cement in a diabetic patient with chronic OM of the midfoot and its mid-term clinical outcomes.

### Case presentation

A 32-year-old male patient, with a history of Type I Diabetes Mellitus, bilateral pes planus valgus, and arterial hypertension, arrives at the emergency department due to month and a half evolving condition consisting of a wound on the left foot caused by a burn with boiling water, initially managed with dressings and oral antibiotic treatment. Increased inflammation, pain,



and functional impairment are noted in the left foot. Laboratory tests reveal elevated inflammatory markers and a Magnetic Resonance Imaging shows findings consistent with OM of the base of the first metatarsal and the medial margin of the first cuneiform of the left foot, along with a pericapsular laminar collection.

Patient is hospitalized for intravenous antibiotic management, surgical cleansing, and the insertion of a cement spacer impregnated with antibiotics. During the first surgical cleansing, devitalized tissue is excised, and pockets discharging purulent fluid are observed. Cement impregnated with Ceftazidime and Vancomycin is placed, and an aspirating Vacuum Assisted Closure is installed. Two more surgical cleansings are performed in the following days, without any new relevant findings. The patient receives a total of 14 days of intravenous antibiotic treatment and undergoes microsurgical Free Flap reconstruction. Due to a favorable evolution, is discharged with intravenous antibiotic management to complete 4 weeks and wound care. Follow-up appointments were conducted at 2,3,4,6, and 12 months, in which the patient exhibited no signs of infection recurrence, without clinical or radiological deformity, and reported pain free-motion as well as other favorable outcomes through self-reported questionnaires.



Figure 3: AP and lateral radiographs of the left foot at 12 months follow-up.



Figure 4: Left foot at 12 months follow-up.



Figure 1: Preoperative wound in left foot.



Figure 2: AP and lateral radiographs of the left foot, after first surgical cleansing.

Discussion

Treatment of OM is perhaps the most controversial area regarding the management of complications in diabetic foot care. Physicians often have to make decisions about its management with inadequate data, largely due to the scarcity of evidence on the subject, resulting in heterogeneity and uncertainty in practice. The usual approach for a condition like this would typically involve amputation through the Lisfranc joint [3].

It has been described that the use of antibiotic-loaded cement combined with systemic antibiotic therapy may reduce the number of amputations, preserving greater stability and biomechanics of the foot [4]. Regarding the management of OM in diabetic feet, the use of antibiotic-loaded cement could be a functional mid-term alternative. It is known that an ideal surgical plan should also prioritize the preservation of weight-bearing capacity whenever feasible. In accordance with the outcomes delineated in this article, it appears reasonable to propose the integration of less invasive methodologies in the

management of this pathology. Such approaches more effectively preserve the foot's anatomy, potentially facilitating enhanced recovery and functionality. Currently, there are no large-scale studies that objectively compare both alternatives in terms of functional outcomes, but there are reported case series with favorable results for the presented management [5].

### Conclusion

Antibiotic cement is a tool with favorable outcomes in the management of OM in diabetic feet, and its proper use could reduce the need for amputation in certain situations. However, the current evidence available does not allow for general recommendations for all patients with these conditions. Clinical judgment must be combined with a thorough understanding of the specific clinical situation of each patient. Further research would be helpful to demonstrate that local antibiotic treatment with cement could be equally effective as amputation without the morbid and functional implications that the latter option entails.

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