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## Case Report

# Treatment of a chronically infected nasal silicone prosthesis with continuous antibiotic irrigation and gentamicin-impregnated polymethylmethacrylate beads

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## ABSTRACT

Infected nasal alloplasts in revision rhinoplasty can be a complex problem, as timing between implant removal and reconstruction is the major limiting factor. Delaying reconstruction can result in loss of mechanical support, a constricted nose, and in severe cases, complete nasal airway collapse and respiratory compromise. In this case report, we describe a novel surgical approach for the management of a chronically infected nasal implant combining techniques used to treat biomaterial-associated infections: antibiotic-impregnated polymethylmethacrylate beads and a continuous catheter-based antibiotic irrigation system.

We report a case of a chronic alloplastic-associated infection following nasal reconstruction using a silicone implant. We utilized a two-staged approach. The involved nasal implant was removed and replaced temporarily with gentamicin-impregnated polymethylmethacrylate beads and a continuous closed irrigation and drainage system with local and parenteral delivery of antibiotics. Both modalities allowed

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for complete eradication of the infection. In addition, the gentamicin beads provided sufficient mechanical support in order to minimize the risk of skin contracture. Twelve days after her initial surgery, nasal reconstruction was performed using a cadaver bone graft. The patient was followed for two years postoperatively and has shown good results with no evidence of skin contracture or recurrent infection. This technique may allow for shorter delay in revision surgery and reduce the risk of long-term complications without compromising functional and aesthetic outcomes.

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## Introduction

Alloplastic nasal implants have been widely used for rhinoplasty for many years.<sup>1–3</sup> However, they have a much higher rate of infection compared to autologous bone and cartilage grafts.<sup>1–3</sup> The treatment of infected implants is complex and varies with the extent of infection and experience of the surgeon. Traditionally, a multi-staged approach would be offered with removal of the implant, debridement of devitalized tissue, treatment with antibiotics, and subsequent reconstruction. A dilemma often arises with such infections owing to the development of biofilms on the implant surface, which can limit antibiotic penetration and delay secondary reconstruction.<sup>3,4</sup> In addition, removing the implant without replacing it with a spacer may result in a constricted soft tissue envelope.<sup>1,2</sup>

In this report, we describe a novel surgical approach for the management of a chronically infected silicone implant combining two successful techniques used to treat biomaterial-associated infections in orthopedic and breast reconstructive surgery. The first approach involves the use of antibiotic-impregnated polymethylmethacrylate (PMMA) beads.<sup>5–7</sup> Their application has made them favorable in orthopedic surgery due to their mechanical and therapeutic properties—to maintain normal alignment after removal of infected prosthetic joints, and allow local release of antibiotics to the surrounding tissue.<sup>5–7</sup> Lastly, the authors report the use of a continuous catheter-based antibiotic irrigation system combined with systemic antibiotics, which has been used to salvage infected nasal cartilage and tissue expanders following breast reconstruction.<sup>3,8</sup>

## Methods

The patient was a 38 year-old woman of Filipino origin who had undergone nasal reconstruction with a silicone nasal implant for a cleft lip and palate deformity, which was performed in the Philippines in 2003. Several years following her repair, she suffered recurrent sinus infections. In 2014, she was evaluated in the office. She was found to have an abscess cavity that lied in continuity with the implant. The external nose was deformed and swollen, and the columella was significantly retracted. Intranasal exam showed a right-sided abscess draining purulent exudate (Figures 1 and 2). She was then treated with oral Doxycycline as an outpatient. Despite weeks of suppressive therapy, she had minimal resolution of her symptoms. For this reason, it was decided that we needed to remove the implant and drain the abscess intraoperatively to prevent further infection.

On January 9, 2015, the patient underwent complex removal of the infected silicone implant, exploration and drainage of the abscess, irrigation using an indwelling catheter-based irrigation system, and placement of the antibiotic-impregnated PMMA beads. Incision at the glabella, nasal tip and columella were made due to significant adhesion of the implant to the surrounding soft tissue. The silicone implant was then explanted and the purulent material was cultured. The pocket was subsequently drained and cleaned of granulation tissue with a curette.

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