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CASE REPORT
Reconstructive

Salvage of Infected Nasal Reconstruction with a Polymethyl Methacrylate Spacer

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Summary: Total nasal reconstruction is a challenging multistage procedure. Infections can destroy the cartilage framework and seriously compromise the result. The use of polymethyl methacrylate with antibiotics as a spacer has been described in the treatment of skeletal infections. Using this same principle, the use of a polymethyl methacrylate with antibiotics spacer for an infected nasal reconstruction is reported in a clinical case. *(Plast Reconstr Surg Glob Open 2017;5:e1300; doi: 10.1097/GOX.0000000000001300; Published online 3 July 2017.)*

Total nasal reconstruction is a challenging multistage procedure. Acute or late infection in nasal reconstruction usually leads to cartilage loss, soft-tissue collapse, and poor result.[1]

The use of polymethyl methacrylate with antibiotics (PMMa) as a solid spacer to deliver antibiotics and avoid soft-tissue collapse has been extensively described in orthopedic septic complications.[2] Applying this same principle, the clinical case of an infected total nasal reconstruction salvaged with a temporary solid PMMa spacer is presented. To the best of the authors' knowledge, this technique has not been reported before.

CASE REPORT

A 45-year-old man presented with a complete nasal defect after tumor resection. Standard staged reconstruction was performed with a radial free forearm flap for internal lining and subsequent skeletal reconstruction with cartilage grafts and a frontal paramedial flap. The patient developed acute infection underneath the frontal flap. The whole cartilage framework was debrided, and the integrity of the internal lining was checked. To avoid the collapse of the frontal flap during the time needed to cure the infection, a solid PMMa spacer with gentamicin and vancomycin with porogen[3] was molded as a temporary scaffold (Fig. 1).

One month later, infection was clinically solved with normalization of C-reactive protein levels. The frontal flap was reelevated and thinned, and the PMMa spacer was removed and replaced by a new costal cartilage nasal skeleton. The evolution was uneventful, with an acceptable final result.

DISCUSSION

PMMa spacers are widely used to treat septic skeletal complications in orthopedic surgery.[2–4] The rationale behind its use is 4-fold: first, they deliver antibiotics by elusion and provide local concentrations several times higher than those obtained after intravenous administration of the same antibiotic, without increasing systemic toxicity; second, they fill the dead space resulting from bone debridement; third, they prevent the collapse of the soft-tissue envelope overlying the treated area; and last, they keep the space for future definitive skeletal reconstruction once removed.[2,4] The addition of certain porogens to classic PMMa has been demonstrated to increase antibiotic elusion.[3]

In sharp contrast with the abundant literature on the use of PMMa in orthopedic surgery, there is a relative paucity of reports on its use in nonskeletal infections.[5]

The blood supply of lining and external flaps used for nasal reconstruction is abundant, and wound infection is uncommon.[1,6] It is mainly associated with internal lining defects, especially in the setting of reconstruction of chemically injured noses (cocaine-abuse) with heavily contaminated nasal fossae. The integrity of the internal lining reconstruction should always be checked if infection occurs in nasal reconstruction, along with aggressive debridement of the cartilage skeleton. Failure to do so will only chronify the problem. Immediate skeletal reconstruction is contraindicated after debridement of septic cartilage grafts, and leaving the frontal flap unsupported will result in irreversible skin shrinkage and collapse. The use of a PMMa spacer can achieve temporary soft-tissue support while assisting in infection control. The shape of the spacer should include the dorsum, columella, and allae,

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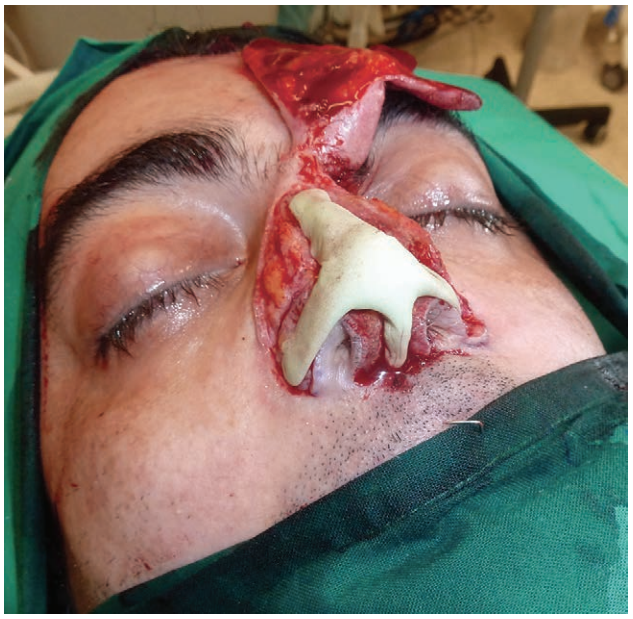

Fig. 1. Intraoperative image of the solid PMMa spacer in place after reelevation of the frontal flap and debridement of the infected cartilage skeleton. The free flap used for intranasal lining is visible underneath the spacer.

without fine details (Fig. 1) and should be bulky enough to provide space for definitive skeletal reconstruction, yet allowing wound closure. The fibrous capsule around the implant should be removed, and the frontal flap thinned when the PMMa is replaced by the definitive cartilage framework.

In this case report, during revision surgery, we used polymethyl methacrylate bone cement spacers to treat local infections, to avoid collapse of flaps, to fill voids between soft tissues, preserving cartilage sites, thus facilitating the following scaffold reconstruction. There is no need of fine-tuning polymethyl methacrylate cement as nasal skeleton shape.

In conclusion, extrapolating the experience in orthopedic surgery, the use of temporary PMMa solid spacers may be useful to avoid skin-envelope collapse in the treatment of infected major nasal reconstructions.

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