

# Bilateral erosion of malar implants into the maxillary sinuses

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Augmentation malarplasty is a cosmetic procedure rarely associated with complications; however, some reported complications are severe. The authors describe a case of missed diagnosis in a patient with chronic sinusitis secondary to erosion of malar implants into the maxillary sinuses. A review of the literature demonstrates that all severe complications of implant-based malar augmentation involve bone erosion and occur many years after initial placement. Silicone implants may have a higher risk for bone erosion and severe complications; however, it is not clear whether this risk is only associated with implants that have not been adequately fixed to the underlying bone. Surgeons should ensure that implants will not move from their original location, and screw fixation is the most reliable method for this purpose. Patients undergoing augmentation malarplasty should be informed of this potential complication so that lengthy workups and unnecessary treatments can be avoided.

**Key Words:** Malar augmentation; Malar implant; Cheek implant

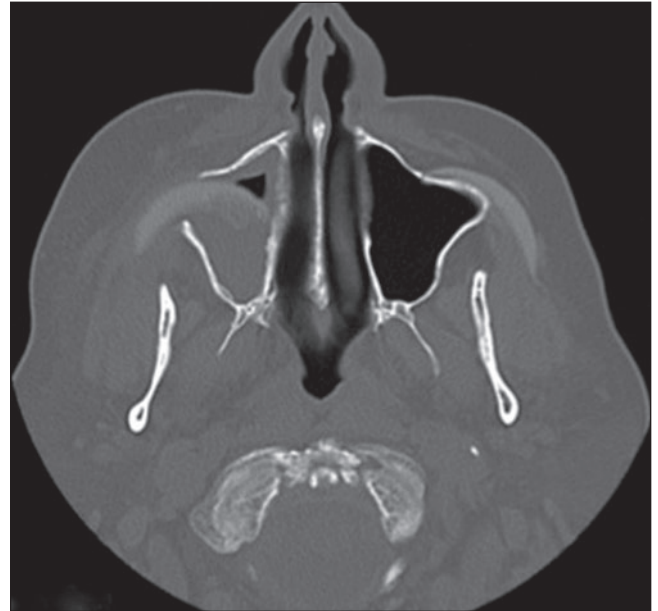
The use of implants for aesthetic and reconstructive malar augmentation was first introduced in 1971 by Hinderer (1) and Spadafora et al (2). Recent advances in injections (both synthetic and autologous) for mid-face volume enhancement have decreased the popularity of this procedure; however, for many years malar implants were the mainstay, and they are still in use today (3,4). Most reports in the literature cite complication rates of 1% to 2% (5-13). Rarely, severe complications have been reported (14-17). Each severe complication involves bone erosion, and involves implants moving into adjacent anatomic areas.

We present a case of bilateral erosion of silicone malar implants into the maxillary sinuses. The condition went unrecognized for some time, resulting in potentially avoidable treatments. A literature review demonstrates common themes, from which we make recommendations for avoidance of this complication.

The present report was approved by the Institutional Review Board of our institution, and written consent was obtained from the patient.

## CASE PRESENTATION

The patient was a 60-year-old woman who had bilateral malar implants placed 17 years previously. She presented with a computed tomography scan performed to evaluate right-sided facial cellulitis. She experienced recurrent sinusitis for the previous six years, which was associated with high fevers and right-sided facial pain. She had been treated with many courses of oral antibiotics, sinus drainage procedures and removal of all of her right maxillary molars. A computed tomography scan demonstrated markedly thickened mucosa on the right. The left sinus had mild mucosal thickening. The right implant had traversed the anterior portion of the maxilla and was eroding the



**Figure 1)** Computed tomography image demonstrating bilateral erosion with sinusitis on right

naso-antral wall medially (Figure 1). The left-sided implant had also eroded through the anterior wall of the sinus and was within the maxillary antrum for a distance of approximately 2 mm. Based on these findings, it was concluded that the implant erosion had caused persistence, and possibly initiation, of the patient's sinusitis. Both implants were found to be within the maxillary sinus at operation, and were removed through intraoral incisions (Figure 2). They were made of silicone and had a Dacron patch on their posterior surface (Figure 3).

## DISCUSSION

The first mention of the potential problem of bony erosion was made by Stark in 1974 (18). He noted that malar augmentation was "a good idea, if it will work." His concern was that the underlying bone could become demineralized. More recently, authors have added credence to his concern because their described cases all involved some degree of bony erosion (3,14-17). Adams and Kawamoto (14) asserted that ensuring the implant is placed over the thick portion of the zygoma would prevent the complication of erosion into the sinus. However, Binder (19) and Terino (20,21) recommend augmentation of the submalar triangle, a space that is directly superficial to the anterior wall of the maxillary sinus. While this area is being more frequently augmented with soft-tissue fillers, malar implant placement has continued over the past decade (4). In our review, each implant moved from its original location to a location within the maxillary sinus,

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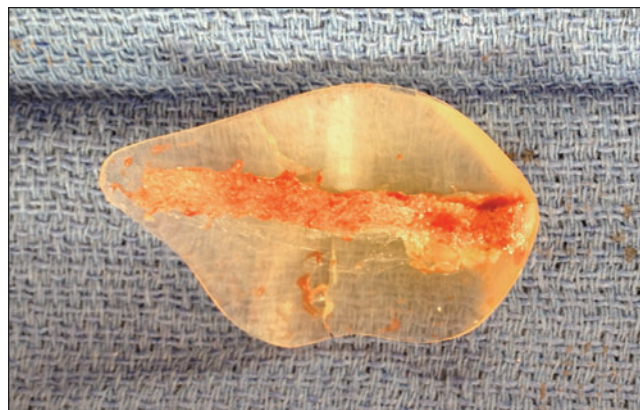


**Figure 2)** Intraoperative image of left-sided implant traversing anterior wall of maxilla

leading to the conclusion that the problem is inadequate fixation (Table 1).

Many fixation methods have been described, including transcutaneous suture bolster, Dacron strip, precisely sizing the pocket, and subperiosteal dissection using a lower ledge of soft tissue to prevent implant migration (5,7,9,13,22-24). Most recently, single- or double-screw fixation has been the method of choice (25-27). Yaremchuk (28) noted that "screw fixation prevents intra-operative or post-operative movement of the implants", which he reports as the cause of most late complications.

The other consideration is whether certain implant materials have a higher proclivity to erode through bone. The most commonly used implants today are silicone and porous polyethylene (Porex, Inc, MedPor, USA). Silicone stimulates the formation of a fibrous capsule, while porous polyethylene allows ingrowth of surrounding tissues (29,30). The most severe complications reported involve silicone implants; however, these implants have been in use the longest and are the majority of implants still in use today (ie, the ratio of complications may simply reflect the ratio of implants placed). Animal studies demonstrate that porous polyethylene causes less underlying bone erosion compared to silicone (31,32). However, none of these studies used fixation techniques, and there are no reports of a screw-fixed silicone implant causing bone erosion.



**Figure 3)** Implant after removal, Dacron patch on posterior surface

Our method is to place a silicone malar implant using an intraoral approach. A 1.5 cm incision is made in the alveolar-buccal sulcus. The subperiosteal plane is entered. The pocket is made precisely the size of the implant, with the tendency to err on the side of making a smaller pocket and then enlarging it after the implant is in place. An inferior ledge of muscle is maintained on which the implant can rest, then one or two self-drilling screws are placed through the implant. Care is taken to ensure that the screw is placed through a thick portion of the bone, either medially adjacent to the piriform aperture and/or laterally and superiorly over the zygoma.

Most concerning about the patient described above was the delay in diagnosis. Notably, while her symptoms were unilateral, we found bilateral erosion at the time of operation. The implant on the infected side had eroded much further into the sinus. It is possible that an infected tooth, rather than the implant, initiated the infection; however, the process did not resolve with removal of the teeth, leading us to conclude that the implant within the sinus caused at least persistence of the process, if not its initiation.

Erosion of malar implants into the sinus is a rare complication, and it tends to be a very late complication, occurring on average, 11.25 years after original placement. To avoid this complication, surgeons should rigidly fix the implants into place, and patients should notify their treating physicians of the presence of malar implants in the case of sinusitis or facial cellulitis.

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**TABLE 1**  
**Case report summary**

First author (reference), year	Patients, n	Description	Implant material	Time after placement
Adams (14), 1995	2	Case 1: Simultaneous full-face dermabrasion. Eroded through skin and had significant bone erosion Case 2: Simultaneous facelift, browlift and lower blepharoplasty, <b>eroded into maxillary sinus</b>	Proplast Proplast	6 years 2 years
Salmin (15), 2012	1	Eroded into alveolar portion of maxilla	Silicone	Not reported
Hatten (16), 2012	1	<b>Eroded through maxilla</b> and orbital floor, caused vision changes with mastication, found adjacent to optic nerve	Silicone	10 years
Ginat (17), 2013	4	Case 1: Unilateral <b>erosion through anterior maxillary sinus</b> Case 2: <b>Bilateral erosion into maxillary sinuses</b> , sinusitis on left Case 3: <b>Unilateral erosion into maxillary sinus</b> with sinusitis Case 4: <b>Unilateral erosion through anterior maxillary sinus</b> and nasoastral wall, with sinusitis	Silicone Silicone Silicone Silicone	10 years 15 years 10 years 20 years
Dale (present study), 2015	1	<b>Bilateral erosion into maxillary sinuses</b> through nasoastral wall on right	Silicone	17 years

*Bold type indicated episodes of maxillary erosion*

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