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## Failed Absorption of Nasal Polylactic Acid Implants (Latera)

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### Case Report

A 54-year-old woman presented with progressive bilateral nasal airway obstruction (NAO) and discomfort over both nasal sidewalls. In April 2017, she underwent bilateral polylactic acid (PLA) nasal implant (Latera™; Spirox, Inc., Redwood City, CA) placement, septoplasty, and bilateral inferior turbinate reduction by an outside surgeon for internal nasal valve collapse (NVC). She denied improvement in breathing after this operation.

She presented to the senior author (B.J.F.W.) in February 2019 for NAO and discomfort, with a Nasal Obstruction Symptom Evaluation (NOSE) score of 25. Her examination was notable for bilateral internal and external NVC. The PLA implants were palpated bilaterally along the nasal dorsum, causing significant discomfort. She was informed to return in 6 months for corrective surgery in hopes of implants resorption. In August 2019, she presented with persistent NAO and discomfort over her nasal bones. Her NOSE score rose to 50 in March 2020.

Open septorhinoplasty with rib grafting and inferior turbinate reductions was performed in September 2020 and both PLA implants were removed (Supplementary Video S1). The implants were noted to have provided poor structural support to the nasal valves and lacked significant collagen deposition. They were resected through an extended open approach and sent for pathological evaluation (Milos Kovacevic, pers. comm.; Fig. 1). Biopsy results demonstrated retained acellular material with continued inflammatory reaction as well as fibrotic tissue around the implants (Fig. 2). The patient's NOSE score was 10 at 3-month follow-up.

### What Would You Do Next?

- A: No further action
- B: Spreader grafts and lateral crural tensioning**
- C: Alar batten grafts
- D: Replacement of Latera grafts

### Discussion

Patients with poor cartilaginous support of the lateral nasal wall may experience NVC and ultimately NAO.<sup>1</sup> Long-term correction of NVC is traditionally accomplished through surgery and typically necessitates graft placement.<sup>1</sup>

Minimally invasive nasal PLA implants are increasingly used to treat NVC. They are reportedly bioabsorbable within 24 months of implantation and promote deposition of collagenized fibrous tissue for nasal valve support.<sup>1-3</sup> However, there have been no long-term studies exploring the implant efficacy or histology at any time point in humans.

This patient presents with PLA implant nonabsorption 41 months after implantation. The implants were identified intraoperatively and it was evident there was a lack of structural support of the nasal valves. In addition, pathological findings demonstrated retained implants, relatively minimal collagen deposition, and continued inflammation 41 months postimplantation. These intraoperative and pathological findings seemingly correspond with the patient's worsening NAO. It is unclear whether her worsening condition is due to failure of the implants in providing structural support initially (possibly due to misplacement or malposition), an inappropriate immune reaction to the implant, or a combination thereof.

Literature has shown that other anatomical implants (e.g., orthopedics), can show delayed or nonabsorption of PLA.<sup>4</sup> In contrast, Rippey et al. showed in an ovine model that PLA nasal implants were completely replaced with mature collagenized connective tissue without evidence of inflammation after 2 years.<sup>3</sup> A 2-year follow-up study on PLA implant efficacy showed that NOSE scores remained significantly below baseline and no patients reporting pain, suggesting implant resorption.<sup>2</sup> This was in contrast to our case, wherein the implants were palpable 41 months after implantation and was associated with significant discomfort. Although nonresorption of

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**Fig. 1.** PLA implant removed intraoperatively during septorhinoplasty and showing tortuous shape. Implant was sent for pathological evaluation. PLA, polylactic acid.

nasal PLA implants has not been identified in the literature, Asik and Atalar show multiple patients with failed meniscal PLA implant resorption with similar inflammatory findings.<sup>4</sup> Thus, there are likely patients who react poorly to PLA implants as evident in the adverse events described by Wakefield et al.<sup>5</sup>

No studies have evaluated PLA implant efficacy beyond 2 years and questions arise whether the implant facilitates long-term NVC correction.<sup>1,2</sup> There is a need for longer term studies to demonstrate continual improvement in patient symptoms and to identify potential causes for implant failure.

**Author Disclosure Statement**

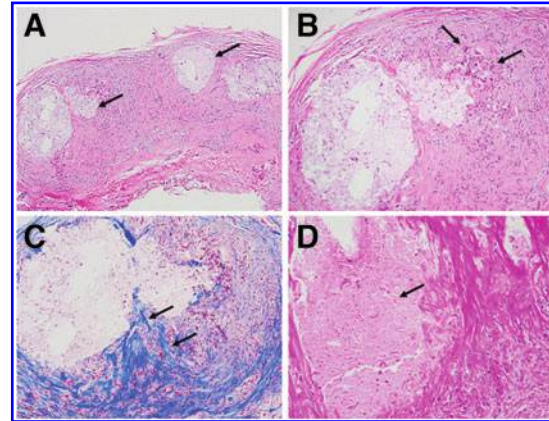
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**Supplementary Material**

Supplementary Video S1



**Fig. 2.** Core biopsy from right and left nasal implants showing fibrous tissue with areas of acellular cystic spaces (A, arrows); closer magnification shows there is foreign body giant cell reaction (B, arrows); dense fibrosis reacted to remnant polylactic acid, highlighted by trichrome stain (C, arrows); foreign material highlighted by PAS stain (D, arrow). PAS, periodic acid Schiff.

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