

# Infection in the Nasal Tip Caused by Acellular Dermal Matrix

Kun Hee Lee, MD, PhD

**Summary:** A 19-year-old female patient visited our clinic for rhinoplasty. She complained about her low take-off point, which was apparent in profile view, and wanted slight tip projection. She refused additional cartilage harvesting from ears or ribs but consented to the use of homologous tissue, including acellular dermal matrix, for her dorsum and tip. Septoturbinoplasty was performed, and only a very small amount of septal cartilage could be harvested. It was used as both the columellar strut and the alar rim graft. Nasal dorsum and tip were augmented with acellular dermal matrix. Three months postoperatively, she experienced a few episodes of edema and redness on her nasal tip, followed by pus exudation from the nasal skin. Six months postoperatively, she underwent revision rhinoplasty for removal of inflamed grafts, and onlay tip graft with homologous rib cartilage was performed. Nasal dorsum or tip grafts are an integral part of Asian rhinoplasty. Autogenous tissue is the gold standard for grafting materials. However, the limited availability of autogenous tissue and the preference of patients and surgeons for artificial surgical implants make Asian rhinoplasty challenging. Unavailability of autogenous cartilage and patient refusal of artificial implants led to the use of acellular dermal matrix (ADM) in the nasal dorsum and tip for this case. This is the first report of postoperative complication because of infection rather than absorption after ADM use. (*Plast Reconstr Surg Glob Open* 2015;3:e581; doi: 10.1097/GOX.0000000000000573; Published online 18 December 2015.)

## CASE

A 19-year-old female patient visited our clinic for rhinoplasty. She complained about her low take-off point that was apparent in profile view and wanted slight tip projection. She refused additional cartilage harvesting from ears or ribs but consented to the use of homologous tissue, including ADM (Megaderm, L&C Bio Co., Seongnam-si, Republic of Korea) for nasal dorsum and tip. Septotur-

binoplasty was performed, and only a very small amount of septal cartilage could be harvested. It was used as both the columellar strut and the alar rim graft. Cephalic resection of the alar cartilage and transdomal suture was performed. Nasal tip projection was unsatisfactory, and it was augmented with ADM. In addition, the nasal dorsum was augmented with ADM to ensure a smooth nasal profile. Three months postoperatively, she experienced a few episodes of edema and redness on the left side of the tip, and pus exuded from the nasal skin (Fig. 1). Infection from the migrated ADM was suspected, and revision surgery was planned. Six months postoperatively, she underwent revision rhinoplasty for removal of inflamed grafts, and onlay tip graft with homologous rib cartilage was performed (Fig. 2). ADM in the nasal dorsum from primary rhinoplasty was incorporated and kept because it showed no signs of infection or migration.

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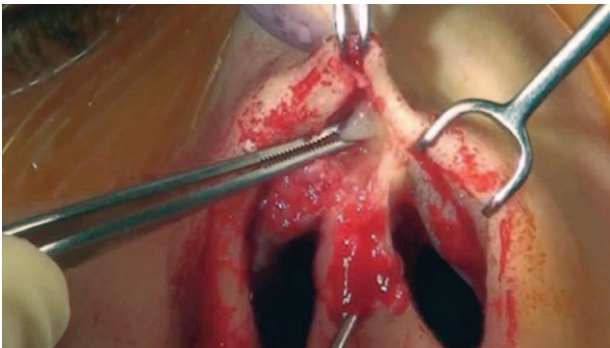
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**Fig. 1.** Basal view of the patient with the infected nasal tip after ADM grafting.



**Fig. 2.** Inflamed ADM graft observed during revision surgery.

### BRIEF REVIEW OF THE LITERATURE

The use of ADM in head and neck reconstruction has been reported since the 1990s.<sup>1</sup> ADM provides collagen matrix for host tissue ingrowth, and histological analysis has revealed no evidence of inflammatory cell infiltration or cell-mediated immune response with ADM use.<sup>2</sup> The material provides a matrix for eventual replacement, making displacement, exposure, and infection rare.<sup>3</sup> In an animal study, 38.8% of the ADM was present at 12 weeks, but it maintained the central graft structure and then started to change peripherally into neocollagen.<sup>4</sup> An additional advantage is that it maintains its structure and contour for as long as it takes the implant to be completely replaced by the newly synthesized collagen.<sup>4</sup>

Jackson et al<sup>5</sup> reported the use of ADM for palpable or visible bony irregularities on the nasal

dorsum as a result either of previous rhinoplasties or of trauma. No infection was discovered in the 6- to 24-month postoperative period in 15 patients.<sup>5</sup> Gyskiewicz et al<sup>3</sup> reported 2-year outcome of the use of ADM for dorsal augmentation, tip grafting, or camouflage over autogenous grafts in 20 patients. Forty-five percent of the patients showed partial graft resorption.<sup>3</sup> However, no infection was reported. No cases of infection, seroma formation, septal perforation, significant resorption, or extrusion related to ADM placement during rhinoplasty and septoplasty were reported among 51 patients.<sup>6</sup> A systematic review revealed that ADM use was not associated with infection.<sup>1</sup> Here, I report a recently encountered case of infection in the nasal tip associated with ADM use.

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### PATIENT CONSENT

*The patient provided written consent for the use of her image.*

### REFERENCES

1. Shridharani SM, Tufaro AP. A systematic review of acellular dermal matrices in head and neck reconstruction. *Plast Reconstr Surg.* 2012;130(5 Suppl 2):35S-43S.
2. Livesey SA, Herndon DN, Hollyoak MA, et al. Transplanted acellular allograft dermal matrix. Potential as a template for the reconstruction of viable dermis. *Transplantation.* 1995;60:1-9.
3. Gyskiewicz JM, Rohrich RJ, Reagan BJ. The use of aloderm for the correction of nasal contour deformities. *Plast Reconstr Surg.* 2001;107:561-570; discussion 571.
4. Hwang K, Hwang JH, Park JH, et al. Experimental study of autologous cartilage, acellular cadaveric dermis, lyophilized bovine pericardium and irradiated bovine tendon: applicability to nasal tip plasty. *J Craniofacial Surg.* 2007;18:551-558.
5. Jackson IT, Yavuzer R, Silverstein P. AlloDerm for dorsal nasal irregularities. *Plast Reconstr Surg.* 2001;107:559-560.
6. Sherris DA, Oriel BS. Human acellular dermal matrix grafts for rhinoplasty. *Aesthet Surg J.* 2011;31(7 Suppl):95S-100S.