Use of AlloDerm implant to improve cosmesis after parotidectomy

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Abstract
We evaluated the effectiveness and practicality of using AlloDerm, an acellular human dermal matrix graft, as an interpositional barrier in an attempt to improve the appearance of the surgical defect created by parotidectomy. We performed AlloDerm reconstruction in a series of 10 patients, and we found that normal contour was satisfactorily restored in all 10. We conclude that the use of an AlloDerm implant is a low-risk, practical option for repairing the surgical defect in postparotidectomy patients.

Introduction
Parotidectomy creates a cosmetic deformity below the ear. Oftentimes, nothing is done to repair this defect because it is not particularly noticeable in a full-face view. However, it is noticeable from oblique and lateral perspectives as a depression below the ear and posterior to the mandible, and this is bothersome to some patients.

Several methods have been attempted to ameliorate this defect, including the creation of various sternomastoid flaps and the transfer of tissue such as fat. We conducted a study to assess the value of using an AlloDerm (LifeCell Corp.; Branchburg, N.J.) graft to fill in the surgical defect and improve the cosmesis of the surgical site in postparotidectomy patients. AlloDerm is an acellular human dermal matrix that is used as an implant for soft-tissue support and contouring. It is derived from cadaveric skin that has been screened for human immunodeficiency virus, hepatitis B and C viruses, human T-lymphotropic virus type 1, and syphilis. AlloDerm does not elicit an immune response after placement because the epidermis and all cellular components are removed during processing. The biochemical and structural properties of collagen type IV that is retained in the dermal matrix make AlloDerm useful as a soft-tissue replacement. This particular use of AlloDerm grew out of an earlier study at our institution in which we evaluated its effectiveness in preventing Frey syndrome.1

Patients and methods
Our study population was made up of 10 patients—4 men and 6 women, aged 37 to 69 years (mean: 52)—who had undergone superficial parotidectomy. Folded sheets of AlloDerm were used to reconstruct the soft-tissue defect created by the surgery. Once a satisfactory contour was achieved, a thick graft (900 μm) was used to cover the entire parotid bed.

The graft was sutured to the masseter muscle anteriorly, to the zygomatic arch superiorly, to the sternocleidomastoid muscle posteroinferiorly, to the tragal perichondrium preauricularly, and to the mastoid periosteum postauricularly.

Results
All 10 patients exhibited excellent cosmetic results as viewed from frontal, lateral, and oblique perspectives. Facial nerve function was normal in all patients despite the fact that the AlloDerm had been applied directly over the nerve branches, which prevented any potential blood supply from reaching the flaps. The only postoperative complication was transient seroma in 3 patients; all of the seromas resolved within 1 week following aspiration, with or without the application of a pressure dressing. The excellent cosmetic results were maintained at the 1-year follow-up (figure).

Discussion
In addition to being a low-risk procedure, AlloDerm grafting offers several advantages over alternate methods of achieving the same goal. AlloDerm is readily available and easy to work with, and its application does not significantly increase operative time. It readily integrates with recipient tissue, and the risk of extrusion is low. Finally, AlloDerm does not produce donor-site morbidity as do autogenous interpositional barriers such as fat.

Among the characteristics of other procedures:

- An inferiorly based sternocleidomastoid muscle flap is one example of an autogenous interpositional barrier that has been shown to improve cosmetic outcomes after parotidectomy.2 However, placement of such a flap not only requires more operative time, but it is also associated with certain postsurgical complications, such as diminished function of the greater auricular nerve.
Moreover, it does not objectively lower the incidence of Frey syndrome, as does the use of AlloDerm.¹

- Interposition of a temporoparietal fascia flap (TPFF)—a thin, fan-shaped, highly vascular flap that is pedicled on the superficial temporal artery—is another autologous graft procedure that has been used to correct the deformity created by parotidectomy.³ Its advantages over other autologous flaps include (1) its ability to conform to the contour of the cheek and (2) the proximity of the donor site to the parotid bed, which means that the surgeon need make only one incision. A disadvantage associated with the use of a TPFF is the risk of injury to the frontal branch of the facial nerve.

- Another reconstruction technique involves the use of a flap made up of three elements: platysma muscle, cervical fascia, and sternocleidomastoid muscle (PCS). In a retrospective evaluation, Kim and Mathog reported that patients who received a PCS flap achieved better overall cosmesis and expressed greater overall satisfaction than did patients who did not receive such a flap.⁴ However, several of the 9 patients who were treated with the PCS flap reported a mild fullness on the operated side, and 2 noted some degree of neck deformity.

- Finally, reconstruction has been performed with an expanded polytef (polytetrafluoroethylene [ePTFE]) soft-tissue patch.⁵ The ePTFE is a synthetic biomaterial that acts as a structural lattice for the overlying skin and the underlying fibrosis that fills the defect, thereby creating a nearly normal contour despite being only 1 to 2 mm thick. The advantages of this biomaterial are similar to those of AlloDerm—that is, the ePTFE patch does not evoke a foreign-body response, it is readily available, and it is easily trimmed and sutured.

The cost of AlloDerm for any particular operation depends on the number and size of the grafts that are necessary, but we estimate that it would average approximately $1,000. Although we have not performed a formal cost analysis, we believe that the cost of the AlloDerm would be offset by the lower costs associated with the shorter amount of operating time that this procedure requires relative to the other techniques.

One concern with postparotidectomy reconstruction with AlloDerm—or any interpositional barrier, for that matter—is that it may mask the recurrence of a high-grade malignancy. Therefore, it is recommended that patients be followed for 2 years following parotidectomy before placement of AlloDerm is considered.

In summation, we conclude that the use of an AlloDerm implant is a low-risk, practical option for repairing the surgical defect in postparotidectomy patients.

References