

Management of the Paralyzed Lower Eyelid by Implanting Auricular Cartilage

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• The success of a procedure to reanimate paralyzed eyelids is determined by the functional and cosmetic results. When the cornea is covered during blinking and sleeping, function has been restored, while a pleasing cosmetic result has been achieved if the eyes appear symmetrical when the lids are open. Several procedures have been developed to restore closure of the paralyzed upper eyelid (implantation of gold weights or open wire springs) or to correct lower lid lagophthalmos and ectropion (lower lid tightening with a Bick procedure or insertion of a closed eyelid spring). In some cases, even a combination of the Bick procedure and insertion of a spring may be insufficient to correct lower lid droop; therefore, we developed a technique to place cartilage into the lower eyelid to correct lid drop. The procedure, suggested by one of us (D.B.S.), has been performed on 51 patients to date. This article reviews our experience with these 51 consecutive patients.

(*Arch Otolaryngol Head Neck Surg*. 1990;116:786-788)

Techniques to restore facial function and cosmesis in patients with facial paralysis are evolving. Multiple procedures may be needed to reanimate various regions of the face, but closure of the eyelids is of paramount importance because eyelid function is essential to protect the cornea. The technique we developed to implant au-

ricular cartilage into the lower eyelid is reproducible as well as reversible, and improves the position of the lower lid as well as restoring function and appearance.

PATIENTS AND METHODS

Indications for Cartilage Insertion

Auricular cartilage was inserted in patients with facial paralysis in whom significant lower eyelid lagophthalmos and/or ectropion was present (Fig 1). Patients underwent lower eyelid procedures both to improve cosmetic appearance and to improve coverage of the lower portion of the cornea. In addition, a lower lid tightening procedure (Bick)¹ was often performed at the same time the cartilage was implanted.

The causes of facial paralysis requiring lower eyelid reanimation are summarized in the Table. These patients usually had their upper eyelids reanimated with a gold weight¹ or open wire spring.²

Cartilage Insertion Technique

Lower eyelid reanimation with cartilage is performed under local anesthesia. One

percent lidocaine (Xylocaine) with 1:100 000 epinephrine is injected into the area of the fossa triangularis on the lateral portion of the pinna, into the corresponding deep portion of the pinna to block cervical cutaneous innervation, and into the lower eyelid in the area where a subciliary incision is made. Topical anesthetic is applied to the patient's cornea, and a protective scleral shield is placed.

The auricular cartilage is harvested from the fossa triangularis of the ipsilateral ear (Fig 2, A). A U-shaped flap, anteriorly based, is elevated and the cartilage is harvested in such a way that perichondrium is left attached to both surfaces (Fig 2, B). The inferosuperior crura are left intact to avoid a cosmetic deformity. The cartilage is then trimmed and stippled with a No. 15 blade through perichondrium and cartilage on the lateral convex side, but not through the perichondrium on the deep side. This maneuver reduces the stiffness and curvature from the cartilage implant. The cartilage implant is trimmed and placed in such a way that it not only conforms to the general curvature of the globe but also to the inferior

Fig 1.—Paralytic ectropion: top, eyes open; bottom, eyes closed.



Accepted for publication December 1, 1989.

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Presented at the annual fall meeting of the American Academy of Facial Plastic and Reconstructive Surgery, New Orleans, La, September 23, 1989.

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rior border of the lower tarsus (Fig 2, B). The flap of skin on the pinna is sutured closed with a running 6-0 mild chromic suture, and the dead space is obliterated with 4-0 chromic mattress through-and-through sutures (Fig 2, C).

The cross-sectional anatomy of the eyelids is illustrated in Fig 3, A. The subciliary incision is placed about 3 mm below the lash line. First, the lower border of the lower tarsus is identified (Fig 3, B) and the inferior depressor muscles are separated from the tarsus so that a plane is developed immediately superficial to the conjunctiva. Then, the dissection is extended inferiorly

to the level of the conjunctival cul-de-sac, about the level of the orbital rim (Fig 3, C). Next, the cartilage is inserted into this pocket and sutured with interrupted 8-0

nylon sutures to the lower border of the inferior tarsus (Fig 3, D and E). The skin is closed with a running interrupted 6-0 mild chromic suture. When a lower lid tighten-

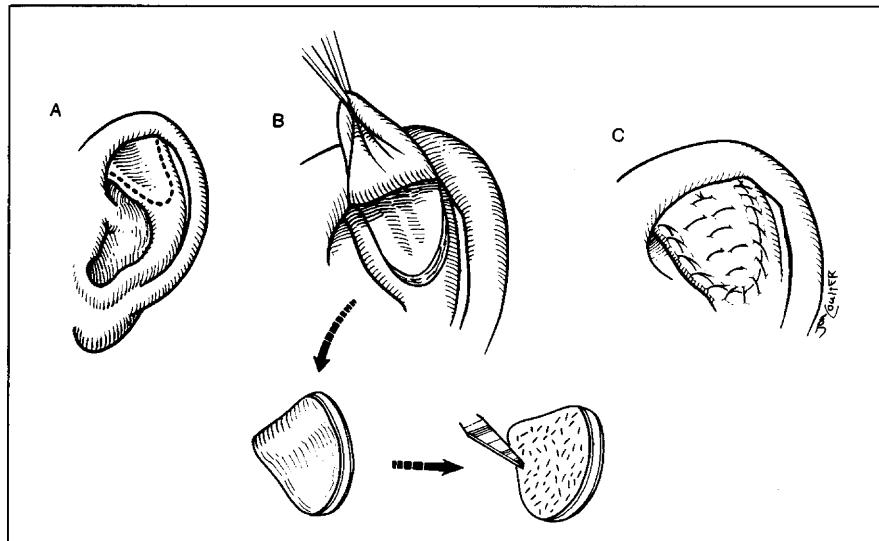


Fig 2.—Techniques: A, harvesting auricular cartilage; B, trimming and fitting cartilage; and C, suturing cartilage harvest site.

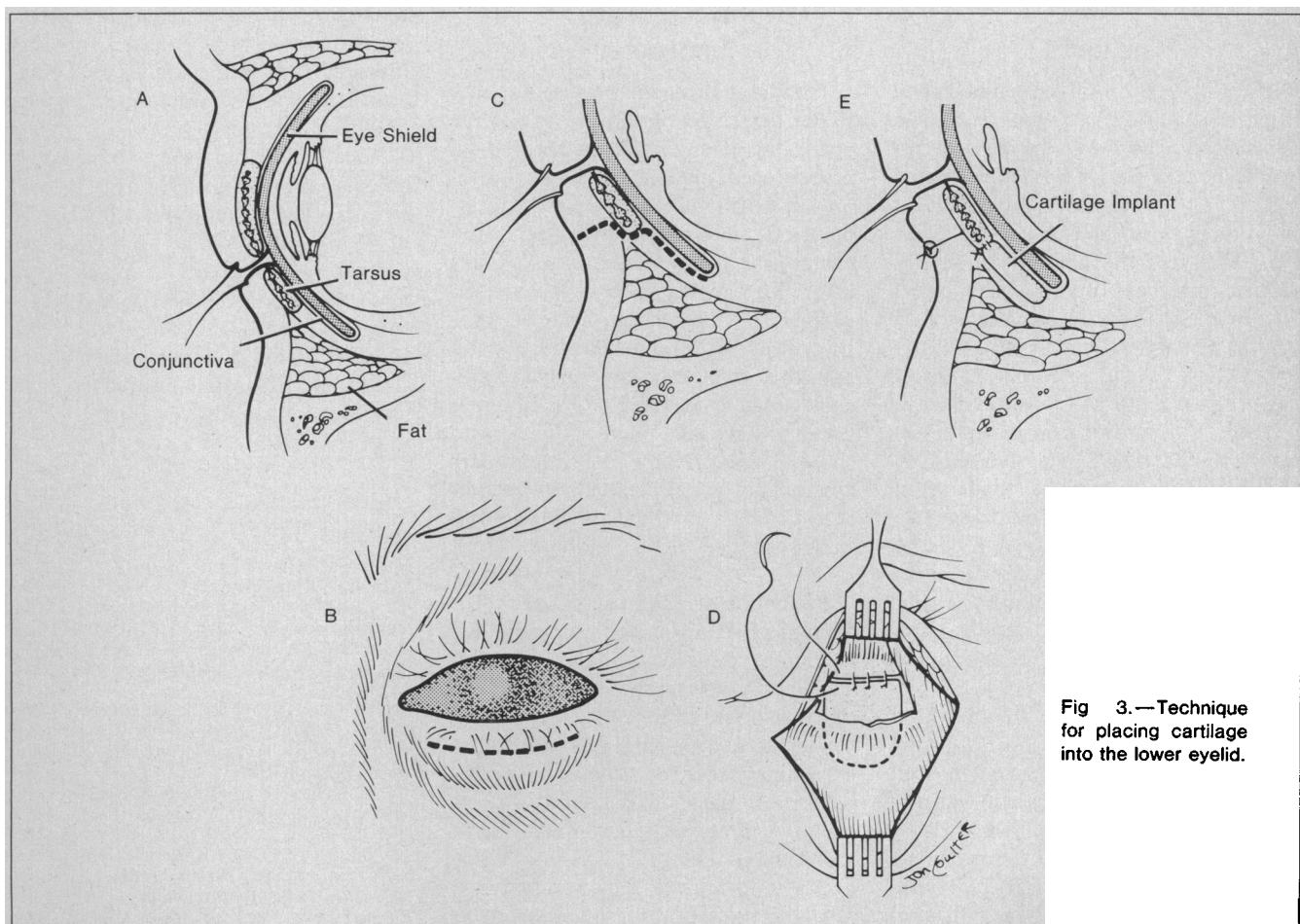


Fig 3.—Technique for placing cartilage into the lower eyelid.

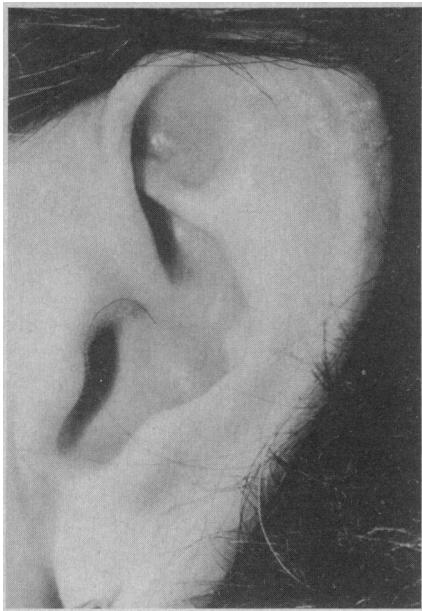


Fig 4.—Donor site, healed.

ing procedure (Bick procedure) is needed, it is performed after insertion of the cartilage implant to prevent tension on the lateral canthal repair, as the pocket for the cartilage implant is developed.

RESULTS

Fifty-one patients have undergone implantation of autogenous auricular cartilage to the lower lid over an 18-month period. Donor sites have healed well (Fig 4). All patients have had improvement in the position of the lower lid (Fig 5), and there have been no implant extrusions. In two of the initial 20 patients the cartilage migrated within a short time after surgery, necessitating revision surgery to resuture the cartilage to the lower border of the tarsus. In this first group of patients the cartilage had been sutured to the lower border of the tarsus using a 7-0 suture (Vicryl); after these two patients experienced slippage of the cartilage, the suture material was changed to 8-0 permanent ethilon, and no evidence of cartilage slippage has occurred in the last 25 patients operated on.

In the first 22 patients, the cartilage was external to the orbital septum and superficial to orbital fat, and in 3 of these 22 patients the cartilage was noticeable beneath the skin. Two of these 3 patients requested that the cartilage implant be removed, and in 1 patient the implant was placed in a deeper



Fig 5.—After cartilage implantation: top, eyes open; bottom, eyes closed.

plane. These results led to revising the technique so that the cartilage is placed in a deeper pocket just over the conjunctiva. Since that time, 29 patients have been operated on with acceptable cosmetic results.

COMMENT

The use of autogenous auricular cartilage grafts to reanimate the lower eyelid has been described previously. Siegel³ used conchal cartilage to correct involutional entropion by augmenting the tarsus, and found that the cartilage was stable for up to 5 years after placement. Matsuo et al⁴ used conchal cartilage to line the lower eyelid posteriorly. Matsuo et al⁴ had good results 6 months after surgery, and they noted that the results of using conchal cartilage were superior to those obtained using nasal septal cartilage. They attributed this to the fact that conchal cartilage is elastic and can be shaped to fit the shape of the globe.⁴

Robbins⁵ described using a chondrodermal graft from the postauricular region for lower eyelid reconstruction. The cartilage was used to replace the missing tarsal plate.

Jackson et al⁶ reported using conchal cartilage grafts for lower eyelid support in 41 patients, including 12 patients with paralytic ectropion due to facial palsy. The graft was placed under a skin-muscle flap and sutured above to the tarsal plate and below to

the periosteum of the inferior orbital rim. They reported excellent results lasting up to 21 months after surgery.

The patients in our series have been followed for up to 18 months, and none has had evidence of resorption of the graft. These results, and those of other investigators, suggest that auricular cartilage remains stable in the eyelid and does not resorb.

Since this article was submitted, 40 additional patients have been treated with the cartilage implant for a total of 91 procedures. The technique has not been altered and the results continue to be excellent with one exception. The cartilage became infected in the 91st patient. On removing the cartilage, the infection cleared without any further problem.

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