

Eyelid Incision for Dacryocystorhinostomy in Asians

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Purpose: Dacryocystorhinostomy via an eyelid incision has been described in Western literature.

This study was undertaken to confirm that eyelid incision for dacryocystorhinostomy is suitable in Asians, because Asians have anatomic features that differ from those of Westerners.

Methods: We performed dacryocystorhinostomy with an eyelid incision along skin wrinkles or relaxed skin tension lines in 57 eyelids of 49 patients from July 2003 to December 2004. The medical records of the patients were reviewed retrospectively.

Results: Postoperative scars were easily camouflaged by wrinkles or relaxed skin tension lines of the eyelid without major complications.

Conclusions: An eyelid incision can be used for dacryocystorhinostomy in Asians, regardless of the lack of a definite lower eyelid crease and the presence of epicanthus. *Korean Journal of Ophthalmology* 19(4):243-246, 2005

Key Words: Asians, Dacryocystorhinostomy, Eyelid Incision

External dacryocystorhinostomy has withstood the test of time; it has been the standard treatment for nasolacrimal obstruction for more than a hundred years.¹ This procedure is traditionally done by a subcutaneous incision in the medial canthus. A linear vertical incision in the nasal skin medial to the angular vein or a curvilinear incision on the anterior lacrimal crest are popular incisions for dacryocystorhinostomy.²

A skin incision through the eyelid crease for dacryocystorhinostomy has been described in the literature.^{3,4} This approach has advantages over the conventional medial canthal incision, as the scar is easily blended with a natural crease providing early rehabilitation for those who wear glasses. A possible limitation of this procedure is difficulty related to exposure of the lacrimal sac and bony surgical sites during the operation.^{4,5} The lower eyelid anatomy of Asians differs from that of Westerners. Distinguishing features of the lower eyelid structures in Asians include a poorly developed eyelid crease and the presence of epicanthus.⁶ Thus, we undertook this study to determine whether the eyelid crease approach for dacryocystorhinostomy is applicable to Asians, and whether the technique has any limitations.

Materials and Methods

From July 2003 to December 2004, dacryocystorhinostomy was performed on 57 eyes of 49 patients using an eyelid incision. The average patient age was 54 years (age range, 6 to 84 years). Twelve patients were men and 37 were women. The original diagnosis for dacryocystorhinostomy was primary acquired nasolacrimal duct obstruction in 44 patients, congenital nasolacrimal duct obstruction in 3 patients, and acquired nasolacrimal duct obstruction of epidemic keratoconjunctivitis in 2 patients. The obstruction level was at the sac or distal to the sac in 52 cases, and in the common canaliculus in 5 cases.

The incision line was made along the most prominent skin wrinkle or relaxed skin tension line. The skin incision line was customized for each patient (Fig. 1). For those with definite skin wrinkling, the most prominent wrinkle was selected for incision (Fig. 1A). For those who lacked a definite wrinkle line, the incision was planned along a relaxed skin tension line 4 mm below the eyelash line (Fig. 1C). For young children, the incision line was placed 2 mm below the lash line in the lower eyelid (Fig. 1D). The most medial extension of this line did not pass the medial canthal angle. The total length of incision ranged from 15 to 18 mm. Anesthesia and hemostasis were achieved by injecting 2% lidocaine with 1:100,000 epinephrine mixed with 0.5% bupivacaine. The skin was incised with a No.15 Bard-Parker blade. Dissection was carried out inferomedially using Stevens Scissors and toothed forceps between the orbicularis muscle layers and the orbital septum until the anterior lacrimal crest was exposed. Care was taken not to violate the

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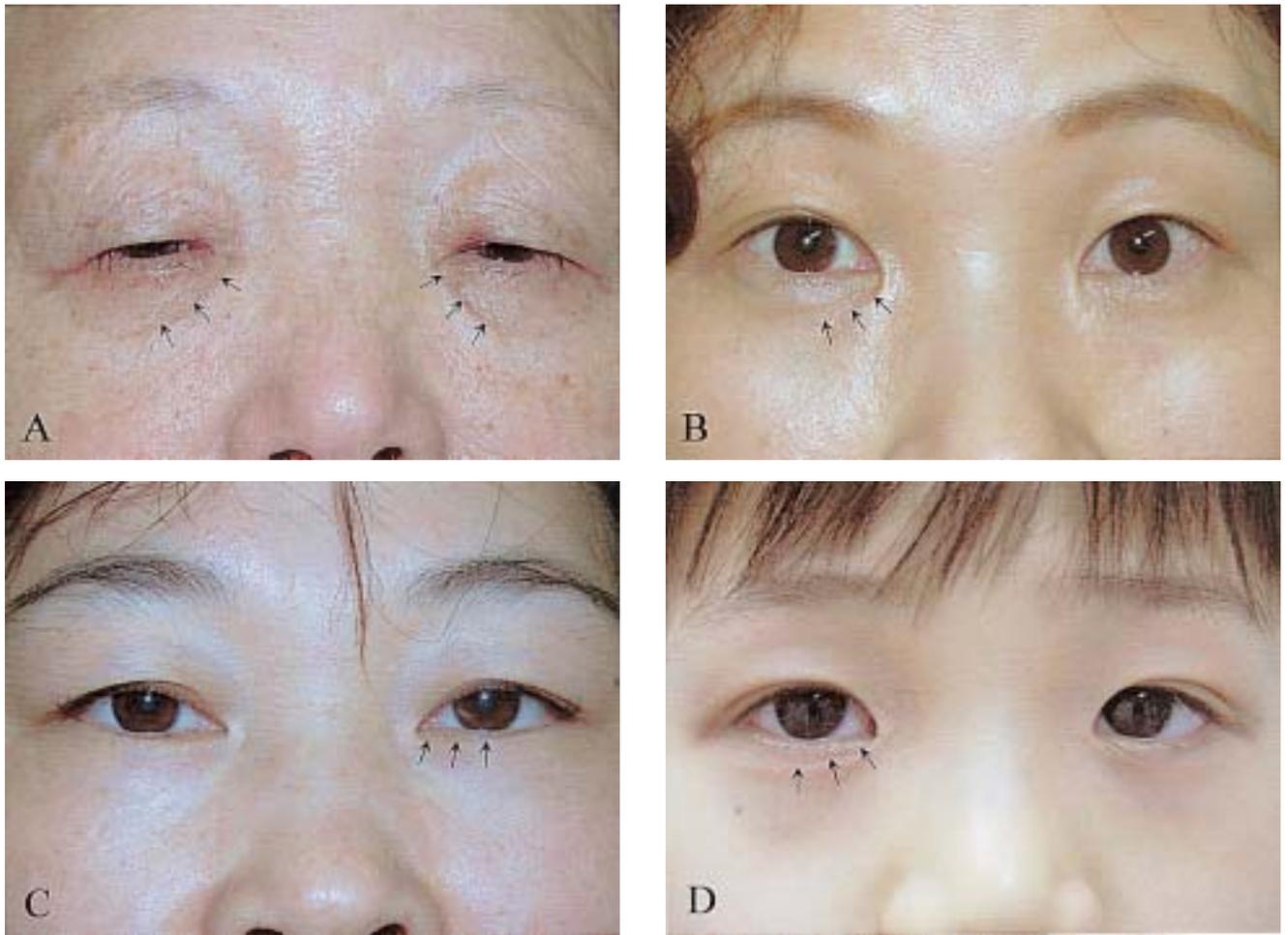


Fig. 1. Postoperative features after eyelid incision in dacryocystorhinostomy (arrows: incision line). (A) A prominent wrinkle was used as the incision line. (B) A relaxed skin tension line was used. The medial end of the incision line should not cross the epicanthal fold. (C) A subciliary incision was used in cases without a definite crease. (D) Subciliary incision for child dacryocystorhinostomy.

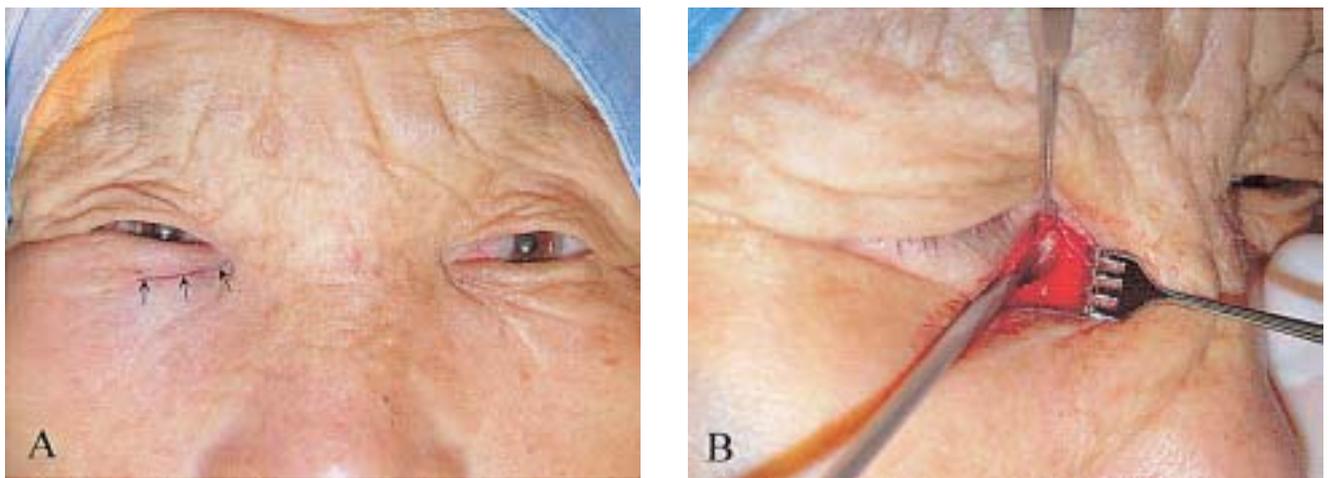


Fig. 2. (A) A prominent wrinkle was used as the incision line (arrows: incision line). (B) A Knapp lacrimal sac retractor was used to retract tissues medially and a Storz double fixation hook to keep the superior portion of the surgical field exposed.

orbital septum during the dissection, as orbital fat would then hinder the surgical view and damage the angular vessel. Exposing the surgical field with a Desmarres lid retractor or Knapp lacrimal sac retractor medially and with a Storz double fixation hook superiorly, the periosteum in the anterior lacrimal crest was incised and the remaining surgical procedures performed (Fig. 2). At the end of the procedure, the skin was closed with a 7-0 nylon continuous suture without subcutaneous sutures.

Results

Dacryocystorhinostomy was performed using an eyelid incision in our series without major difficulties. Retracting the medial skin muscle flap with a Desmarres lid retractor or Knapp lacrimal sac retractor was sufficient to expose the anterior lacrimal crest. In order to expose the fundus of the lacrimal sac or the internal punctum, upward traction of the medial portion of the incision site with a Storz double fixation hook was added. The approach did not hinder internal punctoplasty in cases with common canalicular obstruction.

Early rehabilitation in terms of glasses wearing was excellent. Lid position abnormalities including ectropion and retraction were not observed after surgery.

Significant eyelid scarring was absent at 4 months post-surgery when the silicone tube was removed. Five cases showed erythematous skin reaction and subcutaneous induration, especially in the medial portion of the incision during the early postoperative period. Three of these patients had received an intralesional injection of 0.1ml of Tameceton[□] (Triamcinolone acetonide 40 mg/ml) 2 to 3 weeks postoperatively and no significant postoperative scars were left. Mild tenderness was occasionally found along the anterior lacrimal crest, but this was transient and occurred during the early postoperative period.

Discussion

Skin incisions inevitably leave a cutaneous scar along the incised line. The extent of scar formation is variable and depends on many factors. In order to minimize postoperative skin incision line scarring, the incision should be placed in areas of thin skin and relatively low skin tension. The incision should be of minimal length and should be made within or parallel to lines of relaxed skin tension, or perpendicular to the direction of muscular contraction.⁷⁻⁹

Relaxed skin tension lines are lines that follow the furrows formed when the skin is relaxed, and incisions made in tension lines heal better than those made tangentially to tension lines. In the lower eyelid, relaxed skin tension lines run roughly parallel to wrinkle lines.⁹ In this regard, an eyelid incision is more suitable for dacryocystorhinostomy than a medial canthal incision, which is not parallel to relaxed skin tension lines.

The eyelid skin incision approach to dacryocystorhinostomy could be suitable for patients of all ages. In pediatric patients, a cutaneous incision in the medial canthal region not parallel to relaxed skin tension lines would leave a prominent scar. An endonasal approach is an excellent choice in order to avoid cutaneous scarring. However, this approach is usually difficult to perform in pediatric patients because of a small and narrow nasal cavity. Moreover, postoperative care for the endonasal approach is not easy in the outpatient setting typically used for pediatric patients. The eyelid approach offers a good surgical outcome, and left only inconspicuous scars in pediatric patients in our series. Thus, we found that external dacryocystorhinostomy using an eyelid approach is a suitable alternative to pediatric dacryocystorhinostomy in order to reduce operative scar formation.

In the elderly, the eyelid approach is also useful, because the elderly usually have several skin wrinkles associated with aging. The most prominent wrinkle can be used as an incision line and the resulting scar then blends well with the wrinkle line. The fact that glasses-wearing does not present a problem during the early postoperative period is also a merit of this modality in the elderly.

Putterman⁴ pointed out difficulties associated with tissue retraction during dacryocystorhinostomy with eyelid incision. He described a mechanical retraction system that facilitated exposure of the lacrimal sac and bony surgical sites. However, exposure difficulty was not found to be a problem in our study. The surgical field was maintained with a Desmarres lid retractor or a Knapp lacrimal sac retractor and with a Storz double fixation hook applied by an assistant. If surgery is performed without an assistant's help, medial traction of the lower skin muscle flap should be sufficient to expose the surgical field.

The traditional subcutaneous approach in the medial canthal region usually takes the course parallel to the large angular vessels. Using this method, care must be taken to avoid the angular vessels during dissection. One of the advantages of eyelid incision over medial canthal incision is that eyelid incision is temporal and perpendicular to the angular vessels, which decreases the chance of damaging them.^{2,8}

One of the most distinctive characteristics of the Asian lower eyelid structure is the lack of a definite crease. In our series, most patients did not have a definite lower eyelid crease. However, an individually-tailored incision along a wrinkle line or a relaxed skin tension line yielded good cosmetic results and inconspicuous postoperative scarring.

The presence of epicanthus is another obvious feature of the Asian eyelid.¹⁰ Epicanthus commonly persists through adulthood in Asians and most people with a single eyelid have epicanthus.¹¹ It is important to understand the structure of the epicanthus in performing surgery on the lower eyelid or on the medial canthus in Asian patients. Type III epicanthus by Park's classification, which is the most prevalent type of epicanthus in Asians, shows a skin fold running down

from the upper to the lower lid.¹⁰ The epicanthal fold consists of strips of muscles and dense connective tissues that originate from the medial canthal tendon and extend to the lower eyelid.¹²

In planning an eyelid incision for dacryocystorhinostomy, the medial end of the incision line should not cross the epicanthal fold. Harris et al³ designed the incision line from the point 10 mm medial to the medial canthus, slightly below the level of the medial canthal tendon, into the first lower eyelid crease. The line has left neither bowstring nor significant postoperative scarring in Westerners without epicanthus. If Asian patients undergo eyelid incision as described by Harris et al, a prominent scar can not be avoided, especially in patients with epicanthus. The skin in the epicanthal fold is thick and the direction of the root of the epicanthus is nearly perpendicular to the relaxed skin tension line. It is important not to violate the epicanthal fold in order ensure good postoperative results. In addition, retracting the medial part of incision with a retractor allows the surgical field to be maintained as in non-epicanthus patients.

We found that dacryocystorhinostomy with eyelid incision can be performed in Asian patients without major difficulties or sequelae. It could be used as an alternative approach of dacryocystorhinostomy in Asians that does not leave a noticeable scar on the medial canthus.

References

1. Hurwitz JJ. *The lacrimal system*, 1st ed. Philadelphia: Lippincott, 1996;245-6
2. Linberg JV. *Contemporary issues in ophthalmology*, 1st ed. Vol. 5. New York: Churchill Livingstone, 1988;151-67
3. Harris GJ, Sakol PJ, Beatty RL. Relaxed skin tension line incision for dacryocystorhinostomy. *Am J Ophthalmol* 1989; 108:742-3.
4. Putterman AM. Eyelid incision approach to dacryocystorhinostomy facilitated with a mechanical retraction system. *Am J Ophthalmol* 1994;118:672-4.
5. Hurwitz JJ. *The lacrimal system*, 1st ed. Philadelphia: Lippincott, 1996;268-85.
6. Liu D, Hsu WM. Oriental eyelids. Anatomic difference and surgical consideration. *Ophthal Plast Reconstr Surg* 1986;2: 59-64.
7. McCarthy JG. Introduction to plastic surgery. In : McCarthy JG, ed. *Plastic Surgery*. 1st ed. Philadelphia: WB Saunders, 1990; v. 1. chap. 1
8. Dortzbach R, Woog JJ. Small-incision techniques in ophthalmic plastic surgery. *Ophthalmic Surg* 1990;21:615-22.
9. Freeman MS. Incision planning and basic soft-tissue surgery. *Otolaryngol Clin North Am* 1990;23:865-74.
10. Park JW, Lee BH, Jeong SK, Kim JB. Morphological evaluation of upper eyelid in Korean. *J Korean Ophthalmol Soc* 2000;41:879-85.
11. Liu D, Hsu WM. Oriental eyelids: anatomic differences and surgical consideration. *Ophthal Plast Reconstr Surg* 1986;2: 59-64.
12. Lee Y, Lee E, Park WJ. Anchor epicanthoplasty combined with outfold type double eyelidplasty for Asians: Do we have to make an additional scar to correct the Asian epicanthal fold? *Plast Reconstr Surg* 2000;105:1872-80.