

LACRIMAL SYSTEM INJURY SECONDARY TO COSMETIC RHINOPLASTY

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ABSTRACT

The cases of 500 patients who underwent cosmetic rhinoplasty are reviewed. Ten of these patients (2%) complained of epiphora after surgery. In none of these patients did symptoms persist longer than eight months after surgery. The portion of the lacrimal sac unprotected by the anterior lacrimal crest is vulnerable during rhinoplasty. The elimination of periosteal tunnels and the avoidance of saws may decrease the incidence of damage to the lacrimal sac.

Key Words: Cosmetic rhinoplasty; Dacryostenosis.

INTRODUCTION

This article examines the relationship of cosmetic rhinoplasty to lacrimal excretory system injury. It is commonly assumed that lacrimal system injury during cosmetic rhinoplasty is a rare event requiring little or no treatment because the natural history of this entity is one of spontaneous and uncomplicated healing. However, there is a small yet significant number of cosmetic rhinoplasties that do cause injury to the lacrimal system, necessitating further treatment.

A detailed analysis of this problem with regard to etiology, diagnosis and treatment is presented; a statistical review of 500 personal cases is presented. The pertinent past literature is reviewed.

ANATOMICAL CONSIDERATIONS

A clear understanding of the relationship between lacrimal apparatus injury and cosmetic rhinoplasty is only possible after detailed anatomic analysis of the lacrimal system and its proximity to the operative field.

The lacrimal system is housed both in soft tissue and in a bony complex consisting of the lacrimal bone, the frontal process of the maxilla and the nasal bones. The lacrimal bone, and, more specifically the lacrimal fossa, houses the lacrimal sac, which is protected posteriorly by the posterior lacrimal crest and anteriorly by the anterior lacrimal crest. The anterior lacrimal crest is formed by the junction of the lacrimal bone and the frontal process of the maxilla. The superior and inferior pretarsal orbicularis muscles form the medial canthal tendon, which is attached to the frontal process of the maxilla in front of the lacrimal groove after passing over the lacrimal sac. The tendon also spreads over the posterior lacrimal sac, attaching to the posterior lacrimal crest. This expanse is referred to as the lacrimal diaphragm, to which the lacrimal sac is firmly attached.

SURGICAL ANATOMY

The pertinent anatomy relative to surgical technique involves the lateral osteotomy portion of the cosmetic rhinoplasty. This is illustrated in Figure 1, which clearly delineates the location of the lateral osteotomy, which is utilized to move the nasal bones medially. It is at this juncture in the procedure that the lacrimal system is at greatest risk (Figure 2).

Careful anatomic analysis has shown that the lacrimal canaliculi and common canaliculus lie deep to the medial canthal ligament and enter the lacrimal sac posteriorly, thus making injury of these structures very difficult. In fact, it is extremely rare to injure the canalicular system during routine cosmetic rhinoplasty. The most easily damaged portion of the system is the lacrimal sac, because it is not fully protected by the medial canthal ligament, and extends sometimes well beyond the bony protection of the lacrimal fossa, at times even overlapping the lacrimal crest. In addition, it is a thin walled structure. The region of the nasal lacrimal duct as it exists the sac into the inferior meatus of the nose is in an area unrelated to the osteotomy and thus not significantly at risk.

INCIDENCE

In 1968, Flowers and Anderson [2] examined the incidence of lacrimal system injury by performing dacryocystograms on fresh cadavers, utilizing Lipiodol injection. Of 37 specimens, 17 (23%) showed evidence of disruption of the lacrimal apparatus. Further clinical investigation in the post rhinoplasty patients, by use of fluorescein test, revealed that 21 of 27 consecutive rhinoplasty patients showed lacrimal obstruction within seven days of surgery. However, there were no obstructions noted after three months. In 1976, Cies and Baylis [3] reported three cases of lacrimal system injury after cosmetic rhinoplasty, two of which required DCR for treatment. Flanagan [4] reported four cases of persistent epiphora following cosmetic rhinoplasty. In two of the cases, the patient was referred to an ophthalmologist after occurrence of bleeding from the eye in the immediate postoperative period. Three of the cases required dacryocystorhinostomy (DCR) for relief of symptomatology. In 1979, Osguthorpe and Calcaterra [5] reviewed three cases of rhinoplasty necessitating DCR for relief

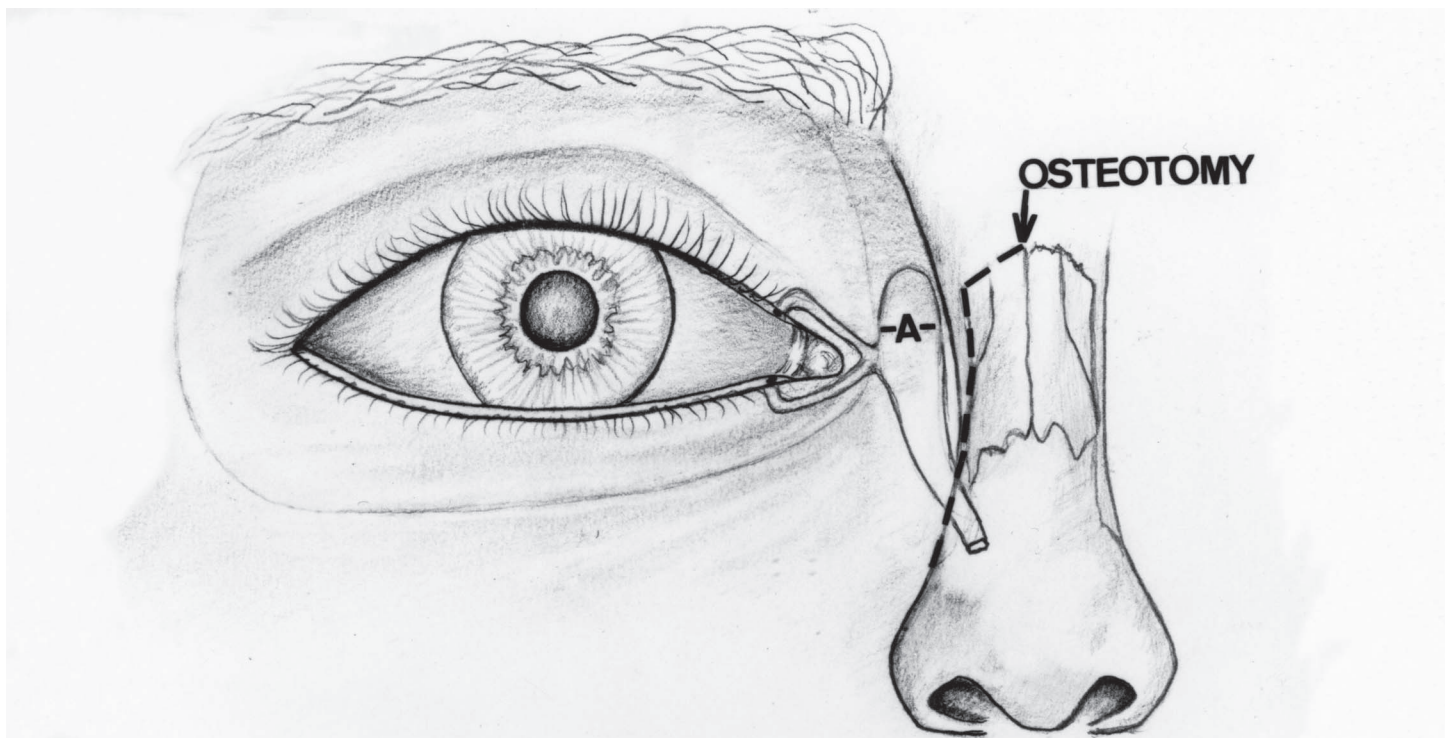


FIGURE 1. Routine osteotomy of nasal bone indicated. Close proximity of lacrimal system (A) to site is shown.

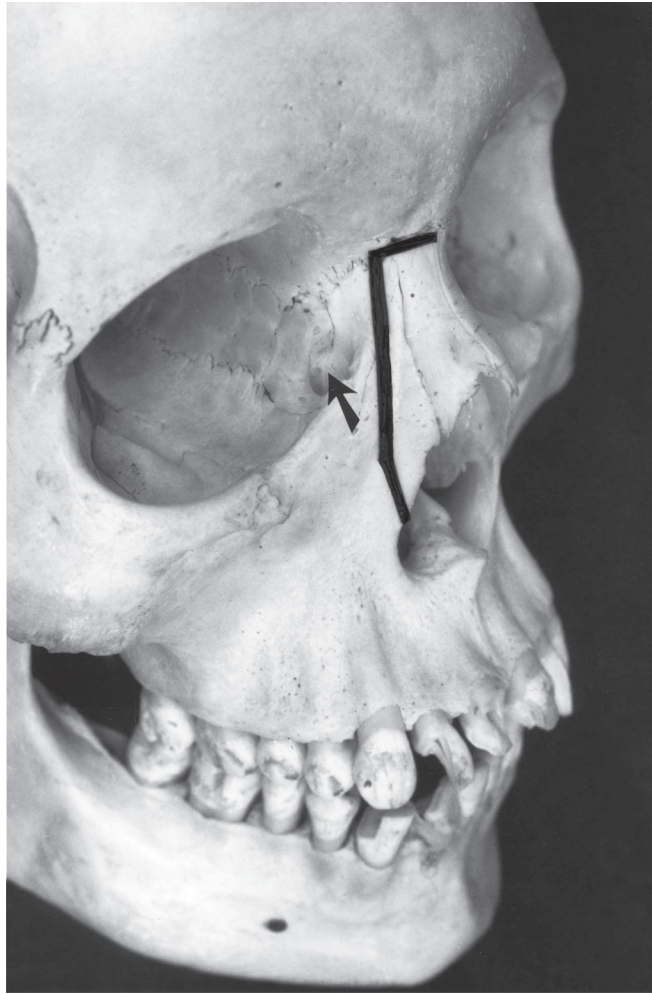


FIGURE 2. Osteotomy outline on skull. Lacrimal sac fossa is well visualized (arrow).

of lacrimal duct obstruction.

A study of 500 consecutive personal cases of cosmetic rhinoplasty are shown in Table 1; they revealed no persistent epiphora although there were some transient symptoms of lacrimal system obstruction.

PREVENTION OF LACRIMAL SYSTEM INJURY; TECHNICAL MODIFICATIONS

It is evident that in a vast majority of cases cosmetic rhinoplasty is performed without any injury to the lacrimal system. However, there are some patients, as noted in the literature, who require surgical treatment for the correction of epiphora. Although the technical aspects of cosmetic rhinoplasty are basically similar, there are several important points that must be stressed in order to decrease the incidence of lacrimal system injury during this rather common operation. As previously discussed, the lacrimal sac is the structure most at risk during cosmetic rhinoplasties, because of the proximity of the osteotomy to this delicately walled structure. Although the medial canthal tendon affords some protection, it can be disrupted if the osteotomy is too low on the maxillary bone. In some techniques, a periosteal tunnel is raised separately, causing disruption of canthal tendon and affording increased risk to the lacrimal sac. Thus, a separate periosteal tunnel should not be raised and saws should not be used to complete the osteotomy. It is preferable to use mini-chisels, which perforate both the nasal bones and the periosteum at one time, thus obviating the need for a separate periosteal tunnel and injury to the medial canthal ligament. The lacrimal sac is protected by the bony structures surrounding the area; however, approximately 11 mm of the

sac inferior to the canthal tendon and temporal to the anterior lacrimal crest are unprotected. Thus, significant osteotomy manipulations in the area of the anterior lacrimal crest are to be avoided.

The vertical portion of the osteotomy is superficial and does not involve the bony nasolacrimal duct, buried deep within rock-hard bone.

CONCLUSIONS

The cosmetic rhinoplasty is safe, efficient and usually associated with minimal lacrimal system complications. There is a small incidence of epiphora following cosmetic rhinoplasty that usually resolves spontaneously. A small subsection of this group of patients does have a definite incidence of persistent lacrimal system injury necessitating DCR. These patients have either a low osteotomy or a very difficult intraoperative course. The lacrimal sac, which by its proximity to the lateral osteotomy and its somewhat vulnerable location and thin wall is usually perforated. Modifications of techniques that do not raise a separate periosteal tunnel, do not use saws, and that make use of miniosteotomes no greater than 4 mm in width are recommended to decrease the incidence of damage to this delicate of the lacrimal system.

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