



Dacryocystectomy: Why Lacrimal Sac Biopsy should be Mandatory

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Abstract

Dacryocystectomy, removal of the lacrimal sac, is a frequent oculoplastic surgical procedure. There are many causes for removing the lacrimal sac, the main one being chronic infection of the lacrimal drainage system. In this article, the authors report their experience with 27 patients operated on from 1998 to 2020 under local anesthesia. All the removed specimens were sent to a histopathologic study. The average follow-up time was 5 months with good results, excluding one patient who was derived to an oncologic ophthalmic center and whose evolution is unknown to us.

Keywords: Dacryocystectomy; Dacryocystitis; Lacrimal sac biopsy; Lacrimal obstruction; Epiphora

Introduction

Blockage of the drainage lacrimal system leads to epiphora, an annoying symptom and a common reason for consultation in ophthalmic practice [1]. Epiphora can occur continuously or intermittently and has many causes, i.e., eyelid malposition, punctal stenosis, dacryocystitis, ocular inflammation, scars, tumors, burns, hypersecretion of tears, conjunctivochalasis, nasal air flow impediment, rhino-sinus abnormalities, cranial nerve V system dysfunctions, Bell's palsy syndrome, paradoxical epiphora or crocodile tears [2-4]. It is obligatory to carry out a thorough examination to arrive at an accurate diagnosis for any watery eye condition and determine ideal treatment.

Methods

This was a retrospective analysis of 27 patients (ages ranging from 32 to 73 years old) undergoing dacryocystectomy, performed by one surgeon (J.S.) from 1998 to 2020. Informed consent was obtained for each procedure, and the review adhered to the Declaration of Helsinki. All patients were from the private practice and all surgeries were performed at the office under local anesthesia plus mild sedation. Oral analgesic and cyclosporinic eye drops were prescribed for one week postoperative. The follow-ups were scheduled at 1 day (removal of the gauze); 6 days (removal of the skin sutures); and at 6 months after the operation.

All patients had nasal and orbit X-ray images. Since 2011, the senior author began to ablate the orbital lobe of the lacrimal gland intending to minimize epiphora after dacryocystectomy [5]. In this cohort, six patients had this annexal procedure. The efficacy of the procedure was evaluated by absence of recurrence, patient comfort, and development of complications. Each patient received oral and written post-care instructions and was encouraged to contact the surgeon or staff at any time.

Surgical Technique

The operation was performed under local anesthesia (with light oral sedation using 5 mg to 10 mg Valium) in the office setting. Topical proparacaine hydrochloride 0.5% eye drops were instilled first. The contralateral eyeball was patched. The anesthesia solution was lidocaine 2% with epinephrine 1:100,000 plus sodium bicarbonate 8.4% in a 1:10 dilution. Nerve blocks of supratrochlear, infratrochlear, nasociliar and infraorbital nerves were used. In cases of the ablation of the orbital lobe of the lacrimal gland, the lacrimal nerve and the local tissue were also infiltrated. No subcutaneous infiltration in the medial canthal area was done avoiding the spreading of infection. The anterosuperior nasal cavity alongside the lacrimal fossa was tamponaded with a strip of cotton gauze moistened with the same anesthetic solution. If there was a dacryocystocele,

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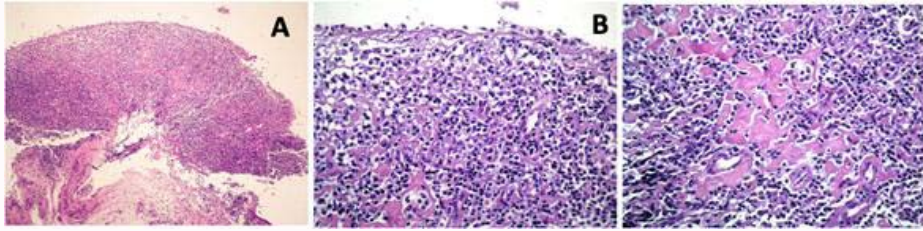


Figure 1: Lacrimal sac mucosa H&E stain on optical microscopy. A, B, C: Immunohistochemistry (IHC) staining was performed in an area of the lacrimal mucosa with atypical monotonous lymphoid infiltration. CD20 and CD79a, highly positive. CD3 positive in some interstitial lymphocytes. Cyclin D1 negative. CD5 positive focal. Proliferation index Ki-67 of 10% approximately. Conclusion after IHC: B phenotype lymphoma, compatible with Mucosa-Associated Lymphoid Tissue (MALT) lymphoma.

an aspiration of its contents was sent to analysis. After 10 min, an oblique incision of 1.5 cm in the canthal area was carried out by a size 15 Bard Parker blade parallel to the angular vessels. Blunt dissection exposed the medial canthal tendon. Bipolar electrohemostasis was achieved. The periosteum of the lacrimal fossa was dissected with a small freer periosteal elevator. A lacrimal probe was introduced in the inferior canaliculus until it protruded from the medial wall of the lacrimal sac. This maneuver permits to identify the surgical area. The lacrimal sac was excised and sent to biopsy study. The deep plane was closed with 5/0 plain catgut and the skin with 5/0 nylon interrupted suture. Steri-Strip™ tape was applied over the incision. The nasal tamponade was taken out. A compressive gauze package was applied to the area. Ice pack was recommended.

Results

Out of the 27 biopsies performed, three of them were abnormal: two were malignant (Figure 1) and one had mascara-stained lacrimal sac tissue (Figure 2). All patients were satisfied with the results. There were no complications.

Discussion

During postgraduate training, there was no instruction given regarding the importance of sending the resected lacrimal sac for biopsy. In 1998, a patient being treated for dacryocystitis requiring the removal of the lacrimal sac recurred after a two-week period. As neoplasia had not been suspected, a biopsy had not been carried out. After recurrence, surgery was performed again and a tumor in the lacrimal sac zone was excised and biopsied, revealing neoplasia. From that moment on, routine histopathological studies of all lacrimal sac specimens were carried out as a protocol.

The lacrimal drainage system, narrower in women, begins in the superior and inferior punctum and ends below the inferior nasal meatus with an average length of 4 cm. The lacrimal sac is the zone most prone to obstruction. Three tests have been used to evaluate tear drainage: The Fluorescein dye disappearance test, probing and irrigation of the drainage system and the Jones I and Jones II tests [4]. One simple maneuver to verify patency of the lacrimal sac is to compress it with a cotton swab and observe if there is lacrimal fluid build-up [5]. Another technique that can be done is to instill antibiotic eye drops and ten minutes later ask the patient about flavor perception in his/her pharynx; we have denominated this TT (Taste Test). When lacrimal sac excision is indicated, a Conjunctivodacryocystorhinostomy (CDCR) with the placement of a Pyrex tube to reconstruct the lacrimal path is the most common choice. Nevertheless, the removal of the orbital lobe of the lacrimal gland is our preferred option [6].

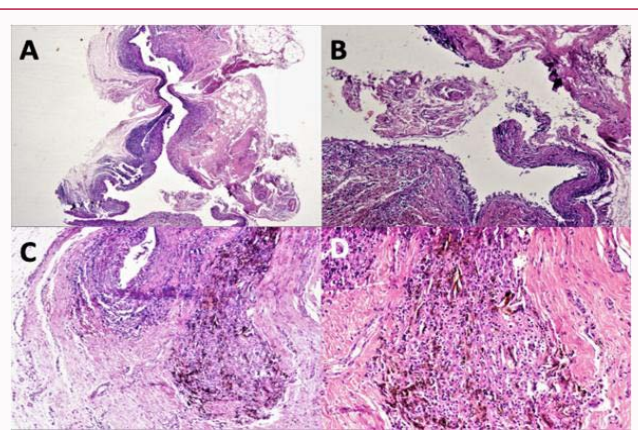


Figure 2: Lacrimal sac with extensive chronic inflammatory process. A, B, C: An accumulation of histiocytes with black pigmentation and foreign acicular bodies. D: With 40x magnification, histiocytes with granular pigment and black birefringent needles as foreign acicular bodies. Findings compatible with foreign bodies associated with use of cosmetic palpebral pigmentary tattoo (eyeliner).

One study with 3,865 lacrimal sac biopsies, revealed non-specific chronic inflammation in 94.15% of the cases, lacrimal sac-specific pathologies in 5.85% and neoplastic pathology was present in 55 of the 3,865 (1.42%). It is important to point out that in almost half of these cases, neoplasia had not been suspected, preoperatively nor during surgery. The authors of the study concluded that routine lacrimal sac biopsy is a relevant step in Dacryocystorhinostomy (DCR) [7].

Another article with 377 lacrimal sac specimens, demonstrated similar results and conclusions [8].

Another review of 193 specimens revealed 3 cases (1.2%) of specific pathology. This study was added to six previous ones resulting in 1,294 biopsies in which seven showed specific pathology (0.5%), which had not been previously suspected. Only one of these seven cases was malignant (0.08%). The conclusion was that lacrimal sac biopsy was not performed unless there had been a reason to suspect pathology other than chronic inflammation [9].

We have observed that one clinical sign that can indicate neoplasia is the external aspect of the involved area (Figure 3).

A survey carried out in our region revealed that our private practice is the only one that performs routine lacrimal sac biopsies which explains the small cohort.

The unsuspected finding of mascara in one of the cases would be one of the first reports in medical literature [10]. In the first one, there is no mention of nasal air path, whereas in our case, there was a

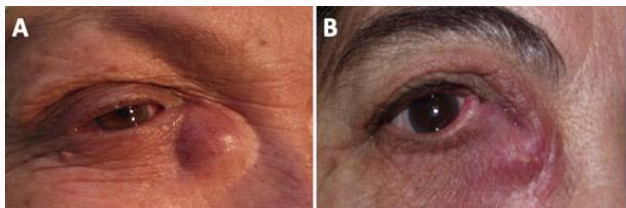


Figure 3: Two different clinical presentations of lacrimal sac involvement. A: Right eye lacrimal sac lesion. The lesion is circumscribed within normal anatomical limit; low probability of neoplasia. B: Right eye lacrimal sac lesion. The lesion goes beyond normal anatomical limits with distortion of the adjacent structures; lacrimal sac tumor malignancy must be ruled out.



Figure 4: Eyeliner. Eyeliner applied to A: the periocular skin of the lower eyelid. B: the surface of the lower eyelid margin.

nasal septum deviation that could explain the unilateral involvement. Another predisposing condition to cause mascara lacrimal staining could be how and where the make-up is applied to the eyelid margin (Figure 4). If lacrimal sac biopsies were carried out routinely, it is possible that more cases of eye makeup-stained lacrimal sacs would become evident.

Conclusion

Nasal air flow is an important factor in lacrimal drainage and is often overlooked. It is advisable to have at least a Cadwell Waters radiological nasal image or, in failing that, computed axial tomography can be considered.

Routine lacrimal sac biopsy is essential in dacryocystectomy. It is also useful in DCR or CDCR surgical procedures; it is not a time-consuming procedure nor does it increase the costs of surgery. However, it may be an important factor in the diagnosis of unsuspected neoplasia.

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