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Endoscopic management of pediatric nasolacrimal anomalies

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Developmental anomalies of the nasolacrimal drainage system typically manifest early in childhood. Although the majority of cases of congenital nasolacrimal obstruction resolve spontaneously with conservative management, certain anomalies like dacryocystoceles require operative intervention. In children with persistent nasolacrimal obstruction, endoscopic dacryocystorhinostomy (DCR) provides an equally efficacious alternative to external DCR that concurrently allows for the potential correction of any predisposing intranasal pathology. Endoscopic DCR is best performed as a joint otolaryngologic–ophthalmologic procedure.

Congenital dacryocystocele (nasolacrimal duct cyst)

A congenital dacryocystocele develops when there is both an imperforate nasolacrimal duct distally and a valve-like obstruction at the junction of the common canaliculus and lacrimal sac proximally (Figure 1).[1] Fluid accumulates, and the nasolacrimal duct system becomes distended. The proximal obstruction is attributed to distention of the sac compressing the canalicular system, causing a functional trap door-type block. The presence of such a functional obstruction can frequently be substantiated by the absence of an anatomical barrier on nasolacrimal probing, as well as by the common finding of a partially patent nasolacrimal drainage system on irrigation or dacryocystogram evaluation.[2,3]

Congenital dacryocystoceles typically present at birth or become apparent within the first few weeks of life as tear production increases. Epiphora is the most common manifestation. In many affected infants, a cystic mass of bluish coloration is noted in the medial canthal region. Infants with congenital dacryocystoceles are at increased risk for secondary infection. Acute dacryocystitis, periorbital cellulitis, or orbital cellulitis in the neonatal age group should raise suspicion of the potential existence of this congenital anomaly.[4,5]

As predicted by its embryologic development, a dacryocystocele should have a nasal component. The clinical association between congenital dacryocystocele and an ipsilateral intranasal cyst has been confirmed with a near 100% correlation when nasal endoscopy is used.[6,7] In some infants, the dacryocystocele expansion may occur only intranasally; other children alternatively present with both an external medial canthal mass and an intranasal mass. Respiratory distress is commonly associated with congenital dacryocystocele with nasal extension because of the fact that infants are obligate nasal breathers; bilateral nasolacrimal duct cysts can cause life-threatening airway obstruction akin to that observed in infants with choanal atresia.[8-11]

All children with suspected dacryocystocele require a thorough nasal examination with flexible or rigid nasal endoscopy. Both nares should be examined, with a focus on the inferior meatus. The application of a topical decongestant such as oxymetazoline hydrochloride to the nasal mucous membranes before endoscopy enhances visualization. A cystic mass arising from the undersurface of the inferior

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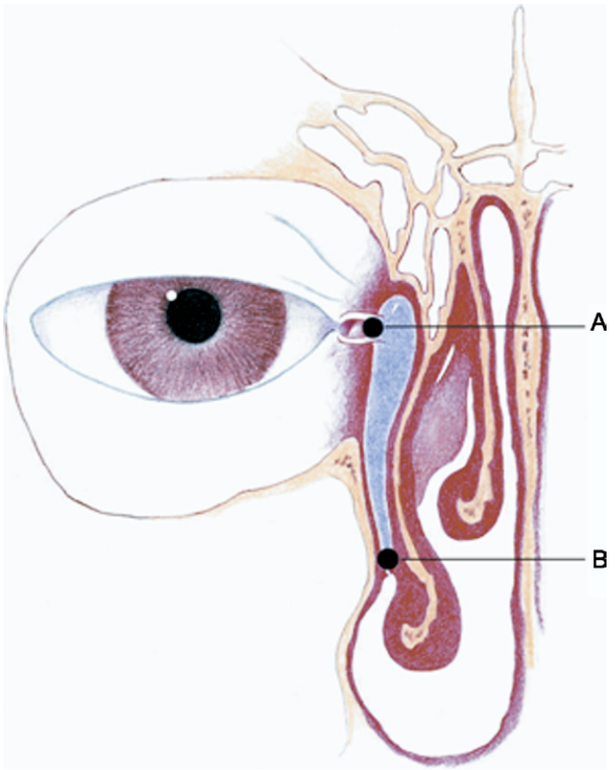

Figure 1 The combination of a valve-like obstruction at the junction of the common canaliculus and the lacrimal sac proximally (A) and an imperforate nasolacrimal duct distally (B) predispose to congenital dacryocystocele formation. (Color version of figure is available online.)

turbinate is sought; at times only redundant mucosa without an obvious cyst is apparent. If a mass is present, it will be soft and compressible when palpated with a nasal probe or suction.

Computed tomography (CT) is the study of choice if radiographic evaluation is performed. The classic CT characteristics of a congenital dacryocystocele include the triad of a medial canthal cystic mass, a dilated ipsilateral nasolacrimal duct, and an intranasal cystic mass in continuity.[12] The intravenous administration of iodinate contrast agents may demonstrate a slight rim of enhancement of these dilated cystic structures.[13] The use of CT additionally provides excellent detail of the surrounding osseous nasal anatomy.

Surgical intervention is indicated if a dacryocystocele presents with associated acute or chronic dacryocystitis, if the external medial canthal cyst is large and visually obstructive, or if there is an intranasal cyst causing respiratory distress. A joint otolaryngologic and ophthalmologic surgical treatment of congenital dacryocystocele is recommended.[3,6,7] When there is an identifiable intranasal cyst, marsupialization with endoscopic excision of the medial cyst wall is preferred over simple cyst puncture with decompression. Even in cases in which there is no evident intranasal cyst, the removal of redundant mucosa from the lateral inferior meatal wall in the presumed region of the valve of Hasner effectively treats the distal obstruction. Cyst marsupialization is best performed in endoscopic instrumental fashion by using appropriately sized, straight or angled, biting forceps (Figure 2). Laser mucosal vaporization is an alternative approach but adds unnecessary time and cost without improved effectiveness. Anesthesia and intraoperative preparation arrangements are identical to those described in the following section on endoscopic dacryocystorhinostomy.

Concomitant nasolacrimal probing and irrigation is necessary to ascertain nasolacrimal system patency. Typically after the nasolacrimal sac has been decompressed distally, the proximal one-way valve of Rosenmuller will be able to function normally. Silicone intubation of the lacrimal outflow system may be performed but is not necessarily required.

Pediatric endoscopic dacryocystorhinostomy

Symptomatic congenital obstruction of the nasolacrimal system is a common clinical problem, estimated to be present in approximately 5% to 6% of newborns.[14] Clinical signs and symptoms depend on the nature and anatomic level of the obstruction. Most commonly, the obstruction is distal at the level of the valve of Hasner between the nasolacrimal duct and nasal cavity. Proximal obstruction

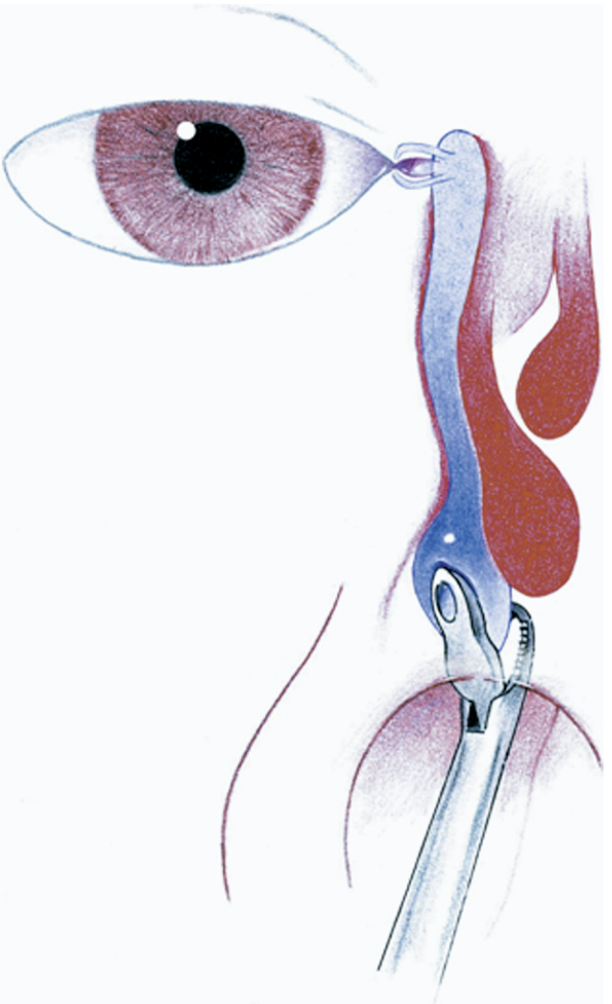

Figure 2 The intranasal portion of a dacryocystocele is best marsupialized endoscopically with appropriately sized straight or angled biting forceps. (Color version of figure is available online.)