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Dacryoendoscopy-assisted nasal endoscopic marsupialization for congenital dacryocystocele

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ABSTRACT

Objective: To examine the surgical outcome of dacryoendoscopy-assisted nasal endoscopic marsupialization for congenital dacryocystocele.

Methods: This is a retrospective, observational study that included 7 sides of 6 patients with congenital dacryocystocele. The surgical indication in 5 of the patients was acute dacryocystitis while one of the patients had no spontaneous resolution after long-term observation. Dacryoendoscopy was used for visualisation of the lacrimal cavity, direct probing of the obstruction at the common canaliculus, and localisation of a deflated intranasal cyst after an initial incision of the cyst. Surgical success was defined when the following postoperative conditions were satisfied: no epiphora, normal tear meniscus height, and complete clearance of the dye 5 min after instilling a drop of 2% fluorescein solution into the inferior conjunctional fornix.

Results: Out of 6 patients, 2 patients were noted to have membranous common canalicular obstruction. Postoperative follow-up ranged from 11 days to 3 months. Surgical success was achieved in all patients without any complication.

Conclusions: Dacryoendoscopy-assisted nasal endoscopic marsupialization is an effective surgical management for congenital dacryocystocele.

1. Introduction

Management of congenital dacryocystocele is crucial. Although congenital dacryocystocele can be spontaneously resolved, cystic extension into the nasal cavity can cause respiratory distress [1]. In addition, dacryocystitis is another common sequela presenting with inflammatory features [1]. In such cases, aggressive management is essential [1].

Nasal endoscopic marsupialization is the most reliable procedure to treat congenital dacryocystocele [2]. During this procedure, a complete excision of the intranasal cystic lesion is necessary. However, after the incision of the cyst, the intranasal cyst deflates. This occasionally makes identification of the cyst wall difficult.

Dacryoendoscopy is a non-invasive method that has been used to directly view, localise and probe the obstructions in the lacrimal drainage system precisely [3,4]. This instrument is equipped with light transmission, which may be helpful to identify the cyst wall. In addition, we can accurately observe the obstruction point at the common canaliculus using dacryoendoscopy. There were only two reported cases in which an intranasal cyst was incised under dacryoendoscopy assistance [3,5]. In this retrospective case series, we describe the surgical outcomes of dacryoendoscopy-assisted endoscopic marsupialization in cases with congenital dacryocystocele.

2. Materials and methods

This single-institution, retrospective study was approved by the Institutional Review Board (IRB) and adhered to the tenets outlined in the Declaration of Helsinki. Due to difficulty in obtaining consent form from patients who had been treated several years previously, the IRB requested an outline of the study to be published on the Aichi Medical University website that was available for public viewing. This gave the patients and their guardians the opportunity to decline to participate; none did. Personal identifiers were removed from the records prior to data analysis.

A retrospective chart review was performed of all patients diagnosed with dacryocystocele at our institution from January 2011 to June 2018. The diagnosis of dacryocystocele was made on the basis of

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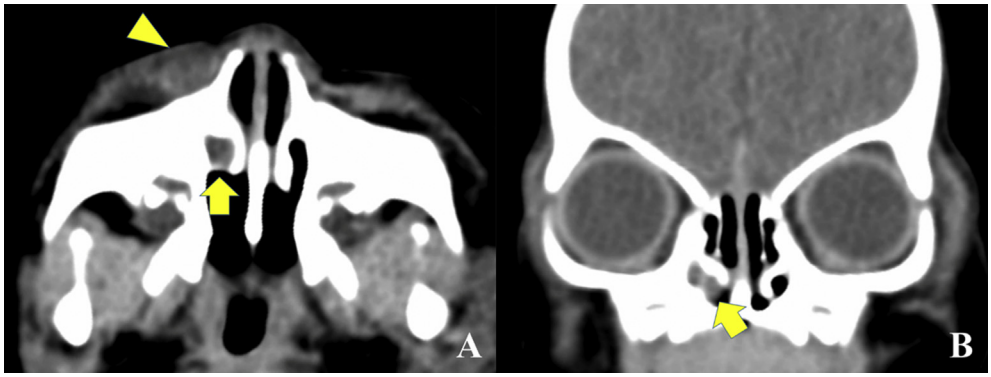

Fig. 1. Computed tomographic images.
A. An axial image. **B.** A coronal image. A swollen lacrimal sac (arrow head) and a cyst in the inferior meatus (arrows) are observed.

the following findings: history of bluish cyst formation at the medial canthal region; a cystic lesion in the inferior nasal meatus visualized with nasal endoscopy with or without computed tomographic (CT) images (Fig. 1). We excluded patients with spontaneous resolution of dacryocystocele.

The following clinical data were collected from patients' medical records and intraoperative video: sex, age (expressed as the mean value ± standard deviation), laterality, the period between birth and day of operation, the presence or absence of spontaneous resolution of dacryrocystocele, infection, and respiratory distress, CT findings, intraoperative findings, and surgical success. Surgical success was defined when the following postoperative conditions were satisfied: no epiphora, normal tear meniscus height, and complete clearance of the dye 5 min after instilling a drop of 2% fluorescein solution into the inferior conjunctional fornix.

Surgery was indicated in patients with acute dacryocystitis, those with respiratory distress, and those without spontaneous resolution after long-term observation. The surgery was performed by 2 oculoplastic surgeons (YT and HK) or by registered doctors supervised by 1 of these 2 oculoplastic surgeons (YT). All surgeries were performed under general anaesthesia and the lacrimal puncta was infiltrated with local anaesthetic (1% lidocaine and epinephrine diluted to 1:100,000). The intranasal space was packed with surgical neuropatties and ribbon gauzes soaked with 0.02% epinephrine. After 2-snip punctoplasty, a dacryoendoscope (FT-203F; FiberTech, Tokyo, Japan) was inserted. The obstruction point at the common canaliculus was observed (Fig. 2A) and direct probing was performed using the tip of the dacryoendoscope in the presence of mechanical obstruction (not a functional one). After opening of the common canaliculus, the endoscope was further advanced until the tip reached the inside of the dacryocystocele (Fig. 2B). Thereafter, the nasal cavity was examined using 0° rigid nasal endoscope with an outside diameter of 2.7 mm. The inferior nasal turbinate was pushed superiorly to widen the surgical space. The dacryocystocele was identified with light transmission from the dacryoendoscope and inflated with distilled water from the dacrysoendoscope channel (Fig. 2C). The dacryocystocele was incised using an ophthalmic knife (Fig. 2D), after which the dacryocystocele was deflated. The wall of the deflated dacryocystocele was removed using a superfine cutting forceps under light guide (Fig. 2E) until completion of marsupialization (Fig. 2F). Hemostasis was ensured during the procedure therefore nasal packing was not necessary after the procedure. Intravenous antibiotic was administered only once, intraoperatively.

3. Results

Patient data are shown in Table 1. Although 8 patients with dacryocystocele were referred to our institution, 2 patients were excluded due to spontaneous resolution of dacryocystocele. Altogether, 6 patients were included in this study. One patient had bilateral dacryocstocele. Acute dacryocystitis developed in 5 patients and there was no spontaneous resolution after long-term observation in 1 patient. None of the patients had respiratory distress. One patient was previously included in another study (Patient #2) [5].

CT was preoperatively taken in 4 out of 6 patients, all of which demonstrated an enlarged lacrimal sac and dacryocystocele in the inferior nasal meatus (Fig. 1).

The range of the period from the birth to the day of operation was 21 days to 1 year and 11 months, and postoperative follow-up period was 11 days to 3 months. Two of the 6 patients (Patients #1 and #6) apparently had a membranous obstruction at the common canaliculus (Fig. 2A), which was eventually perforated by the tip of the dacryoendoscopy. Surgical success was achieved in all patients without any complication.

4. Discussion

All the 6 cases of congenital dacryocystocele in our study were successfully managed by nasal endoscopic marsupialization under dacryoendoscopic assistance.

Dacryoendoscopy can visualize the lacrimal cavity with accuracy. This enables surgeons to perform direct dacryoendoscopic probing of the obstruction point and to evaluate the condition of the inner wall of the cyst. Simultaneously, by identifying the light emitted by the tip of the dacryoendoscope, nasal endoscopy further aids in localising the deflated cyst from the nasal side, resulting in an uncomplicated marsupialization.

Two of the 6 patients apparently had membranous obstruction at the common canaliculus. Although obstruction at the common canaliculus in patients with congenital dacryocystocele had been thought to be functional [6], none of the previous studies have confirmed it. The membranous obstruction could have been originally functional and could have developed secondary to inflammation in the lacrimal sac. This finding indicates the importance of meticulous dacryoendoscopic probing of the obstruction point at the common canaliculus in patients with congenital dacryocystocele.

Probing is a simple and effective procedure for congenital dacryocystocele. This can be easily performed under local anaesthesia with proper stabilization of the patient. However, the success rate is relatively low (53–100%) and recurrence can occur after initial resolution of symptoms [7]. With probing an intranasal cyst, scar tissue usually forms in the cyst wall, making it difficult for cyst removal in the subsequent surgery. Nasal endoscopic marsupialization is a better treatment option for congenital dacryocystocele especially for institutions with registered anaesthesiologists and a readily available endoscopic setup.

In our study, a superfine cutting forceps was used to completely remove the intranasal cyst. However, studies have shown that a microdebrider allows much quicker and efficient removal of an intranasal