SCIENTIFIC REPORT

Dacryocystorhinostomy in patients lacking an ipsilateral nasal cavity

Hooman Sherafat, Jodhbir S Mehta, Geoffrey E Rose

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Dacryocystorhinostomy (DCR) remains the surgery of choice for the treatment of epiphora secondary to nasolacrimal duct (NLD) obstruction. It involves creating a direct soft-tissue anastomosis between the lacrimal sac and the ipsilateral nasal cavity, via an osteotomy created by removal of the floor of the lacrimal fossa and surrounding bone. Successful surgery clearly requires the presence of a nasal space and absence of this poses a surgical challenge.

We describe three patients with absent nasal cavity on the side of lacrimal obstruction, where DCR was performed by the creation of an anastomosis between the lacrimal sac and the contralateral nasal space.

CASE REPORTS

Case 1

A 19 year old female with congenital right hemifacial microsomia was referred to the Lacrimal Service with severe right epiphora and variable mucoid discharge. She had previously undergone a number of facial reconstructive procedures, including palatal bone grafting and a two-stage forehead flap reconstruction.

The patient had a mild right lower lid lateral ectropion, a prominent medial epicanthic fold, and a paranasal scar from a previously attempted DCR. There was an expressible right lacrimal sac mucocoele. Cranial CT revealed hypoplasia of the right ethmoids and maxilla, absence of the right-sided nasal airspace and frontal sinus, and a right lacrimal sac mucocoele (fig 1). The frontal lobe and floor of the anterior cranial fossa were depressed on the right hand side. The left paranasal sinuses and nasal airspace were normal.

The patient underwent a right external DCR, the osteotomy being extended through the lacrimal and nasal bones, across the nasal septum and into the left nasal air-space. The area of the septal opening was larger than that of the opened lacrimal sac, care was taken to avoid damaging bone support for the nasal bridge, and anterior and posterior sutured mucosal unions fashioned between the right lacrimal sac and the septal mucosa of the left nasal space. Mucosal anastomosis were created with interrupted sutures using 6/0 Vicryl (Ethicon Ltd.) on an 8 mm half-circle, spatulated needle. The silicone intubation, with tubes in the left nares, was removed 4 weeks later, with resolution of both volume and flow symptoms.

Case 2

A 36 year old man with hypertelorism was referred with a chronic left lacrimal sac mucocoele, associated with epiphora and gross muco-purulent ocular discharge. He had undergone multiple cranio-facial reconstructive surgeries, including a bone graft to the nasal bridge and a midline cranial reduction. Left

dacryocystectomy had been attempted prior to referral to the Lacrimal Service at Moorfields Eye Hospital.

There were multiple scars from previous surgeries and a left mechanical ptosis due to a gross conjunctivitis secondary to reflux from a giant lacrimal sac mucocoele (fig 2A). The superomedial rim of the left orbit was deficient, the upper punctum was medially displaced and in ectropion due to the huge lacrimal mucocoele, but the lower punctum was in a satisfactory position. Dacryocystography confirmed the presence of a left mucocoele and the absence of a left-sided nasal airway (fig 2B).

A 4 cm diameter mucocoele was found at surgery, this having walls of 6 mm thickness, and the patient underwent a left DCR, with silicone intubation, to the contralateral nasal space through an opening in the nasal septum (fig 2C). When reviewed 6 weeks later, the patient had a complete cure of

Figure 1 (Case 1): Cranio-facial CT showing a low floor to the right paramedian anterior cranial fossa, non-aeration of hypoplastic right ethmoidal and maxillary sinuses, and absence of the right nasal airspace. Although slightly large, the left intranasal structures are of reasonably normal configuration. Informed consent was obtained for publication of this figure.

Abbreviations: DCR, dacryocystorhinostomy; NLD, nasolacrimal duct

Figure 2 (Case 2): (A) Having had major reconstruction for a midline cranio-facial anomaly, the patient had gross left mucopurulent conjunctivitis and ptosis due to a giant lacrimal sac mucocoele. (B) Dacryocystography showed evidence of extensive prior cranio-facial surgery, a very thick-walled left lacrimal sac mucocoele (outlined), and absence of a left nasal airspace; the nearest airspace is on the right side (arrows). (C) The patient on the first day after trans-septal anastomosis of the left lacrimal sac to the contralateral nasal mucosa, showing passage of silicone intubation from the right nostril. (D) Six weeks after surgery, there has been a complete cure of lacrimal symptoms, resolution of the ptosis, and markedly improved configuration of the left inner canthus. Informed consent was obtained for publication of this figure.

Figure 3 (Case 3): (A) Axial CT showing nasal dysplasia, with gross left-deviated orbital septum and the anterior portion of the left nasal space filled with soft tissues (light arrow); the left air space is present posteriorly (dark arrow). (B) to (D) Coronal images from anterior (B) to posterior (D) confirm the abnormal, non-aerated left anterior nasal space, together with a markedly abnormal left maxilla and a left-sided oro-nasal cleft. A major distortion of the skull base is evident and both the right nasal space (although present throughout its length) and right turbinates are highly abnormal. Informed consent was obtained for publication of this figure.

symptoms, resolution of the ptosis, and a significantly improved left inner canthal anatomy (fig 2D).

Case 3

A young girl with prior left lateral proboscis and maxillo-orbital clefting, for which she had undergone four operations between the age of 4 months and 6 years, was referred to Moorfields Eye Hospital at the age of 11 years. She was troubled by left-sided watering and recurrent ocular infections, together with concerns about the appearance of the left inner canthus.

The right eye was normal, but the visual acuity limited to 6/18 due to congenital nystagmus. Left microphthalmia and corectopia was associated with 1 cm of lateral displacement (and marked downward tilt) of an abnormally-rounded inner canthus. A small coloboma was present at the inner one-third of the upper eyelid, with complete absence of any upper

canaliculus, and purulent debris could be expressed from the lower punctum when pressure was applied over the lacrimal sac. Imaging showed major clefting of the left side of hard palate, marked left maxillo-ethmoidal hypoplasia with left-deviated septum, and a highly abnormal left anterior nasal space filled with soft-tissues (figs 3 A–D).

The child underwent left external dacryocystorhinostomy with pentagon excision of the upper eyelid coloboma. The nasal osteotomy—even when extended posteriorly—only provided access into an aborted left nasal space filled with connective tissue and the nasal septum was, therefore, fenestrated to provide access into the air space on the right-hand side. By making the septal opening large enough, sutured anterior and posterior anastomoses were achieved between the right nasal septal and left lacrimal sac mucosae, and silicone intubation placed through the lower canaliculus (with “blind” return of

the second bodkin of the intubation via the left inner canthus). The post-operative period was without complication and there was complete cure of ocular infections and discharge, although some tendency to watering of the left eye; closed placement of a Lester Jones canalicular bypass tube is being considered for when further facial and nasal reconstruction has been completed.

DISCUSSION

Dacryocystorhinostomy is a commonly performed and highly successful operation for nasolacrimal duct obstruction.¹⁻³ Normally an anastomosis is formed between the lacrimal sac and the ipsilateral nasal cavity and, to our knowledge, there are no reported cases of a DCR anastomosis being created between the lacrimal sac and the contralateral nasal space. Absence of an ipsilateral nasal cavity should not, therefore, be regarded as precluding successful lacrimal surgery. However, as such cases are often associated with other craniofacial anomalies, a detailed preoperative imaging is imperative in enabling the surgeon to perform the procedure safely and effectively and

particular care should be taken to avoid damaging support for the nasal bridge.

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