

External Dacryocystorhinostomy for Paediatric Nasolacrimal Duct Obstruction

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Aim: To assess the results of anterior flap external dacryocystorhinostomy without silicone intubation in children with congenital nasolacrimal duct obstruction.

Patients and Methods: Clinical case records of 44 paediatric external dacryocystorhinostomies out of the total 1200 external dacryocystorhinostomies (3.75%) performed by an experienced lacrimal surgeon were reviewed. The age range was 4 to 14 years (mean, 8.7 years). Five children with less than 6 months' follow-up were excluded from the study. The duration of follow-up ranged from 6 months to 40 months (mean, 12 months). None of the patients had lacrimal intubation and in all cases only the anterior flaps of the sac and nasal mucosa were sutured.

Results: The cause of dacryocystitis was congenital nasolacrimal duct obstruction in all children. All children had previous failed probing elsewhere. Success was defined as patent postoperative lacrimal irrigation or no regurgitation of fluid on pressure over the sac area and relief from presenting signs and symptoms. Success was achieved in 37 children (97.50%). None of the patients had any postoperative complications.

Conclusions: Anterior flap external dacryocystorhinostomy has a good success rate in the paediatric age group. The study also indicates that routine silicone intubation seems questionable, although this issue needs to be studied further.

Key words: Dacryocystorhinostomy, Lacrimal duct obstruction, Nasolacrimal duct, Retrospective studies, Treatment outcome

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Introduction

Dacryocystorhinostomy (DCR) in the paediatric age group is not as predictable as in adults due to developmental changes in the anatomy and vigorous response to healing. Obstruction of the nasolacrimal drainage system is extremely common in the paediatric age group, occurring in as many as 30% of newborns. However, only 1% to 6% of these children become symptomatic. In approximately 80% of these patients, the epiphora will resolve spontaneously by 1 year of age.^{1,2} Probing is highly successful in younger children and recent studies have shown encouraging results in older children also.

Robb,³ Honavar,⁴ El-Mansoury et al⁵ and Maheshwari⁶ reported a success rate above 80% in older children. DCR is indicated in children with primary nasolacrimal duct obstructions unresponsive to multiple probing or those presenting at a later age with chronic

dacryocystitis or mucocele. The present study was undertaken to assess the results of anterior flap external DCR in children aged 4 to 14 years. A modified surgical technique from previous similar studies was used in suturing only the anterior flaps fashioned from the lacrimal sac and nasal mucosa. All surgeries were performed by the author.

Patients and Methods

The study group was obtained from retrospective record review of 44 consecutive cases of chronic dacryocystitis who underwent anterior flap DCR from January 2000 to April 2005. The children ranged in age from 4 to 14 years (mean, 8.7 years). There were 15 girls and 29 boys. The diagnosis of chronic dacryocystitis was made on the basis of ophthalmic history along with ophthalmic evaluation that showed increased tear meniscus, crusting and reflux of mucopurulent material on pressure over the sac area. Inclusion criteria included children with multiple failed probing, mucocele and acute or chronic dacryocystitis. Presenting symptoms, prior therapies and presumed aetiologies were documented. All data were taken from the Institute medical records department.

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All surgeries were performed under general anaesthesia. A standard surgical technique was used for all patients. A 2 mL local infiltrative anaesthesia consisting of 2% lignocaine with 1:200,000 epinephrine was administered in the region of the medial canthus near the anterior lacrimal crest. The nasal mucosa was anaesthetised with a cotton gauze piece soaked in 2% lignocaine mixed with 1:200,000 epinephrine. A skin incision was placed over the anterior lacrimal crest starting below the medial canthal tendon, 10-12 mm in length. The orbicularis muscle fibers were separated, exposing the periosteum over the anterior lacrimal crest. The periosteum was incised and lifted away from the lacrimal sac fossa. The medial wall of the fossa was punctured with a blunt dissector and osteotomy enlarged up to the medial palpebral ligament superiorly, the junction of the sac and nasolacrimal canal inferiorly, the posterior lacrimal crest posteriorly and anteriorly to include the anterior lacrimal crest. Anterior flaps from the lacrimal sac and nasal mucosa were fashioned and the flap closed with 2 interrupted 6-0 vicryl sutures. Subcutaneous tissue and skin were closed with interrupted 6-0 vicryl. It is important to note that the medial palpebral ligament was not cut during surgery, thus preserving the physiological pumping mechanism of the lacrimal pump.

Postoperative management included topical and systemic antibiotics. The nasal pack was removed on the second day and where possible saline irrigation was done to check for patency of the surgery. The preoperative symptoms, signs and the degree of resolution were assessed from parental observation and clinical examination appropriate for the patient's age. Children were advised to present for follow-up after 1 week, 6 weeks, 3 months, 6 months, and yearly thereafter. On each follow-up, children were assessed for crusting, discharge, regurgitation, swelling and increased tear meniscus height. Also, parents were specifically asked about persistence of previous symptoms if any. This was confirmed by saline irrigation in older children and dye disappearance test in small children.

Success in this study was defined as patent saline irrigation or normal dye disappearance test and complete resolution of symptoms and previous signs at 6-week follow-up. Children with persistence of discharge, regurgitation and blocked syringing or abnormal dye disappearance test were considered unsuccessful. Children with wetting of eyes only with provocation were considered successful.

Results

Out of a total of 1200 external DCRs performed, 44 (44 eyes of 40 children) were in children aged between 4 and 14 years (mean, 8.7 years). There were 27 right-sided and 17 left-sided operations.

Four children underwent bilateral surgery at different time intervals and these were treated as separate cases. The cause of nasolacrimal duct obstruction was congenital dacryocystitis in all children. Five children (all unilateral cases) were excluded from the study because of shorter follow-up. Out of the five children, 2 children had follow-up of 1 week and 3 did not come for check-up after 6 weeks. All 5 of these children were doing well on their last follow-up. Success was evaluated at follow-up of 6 weeks; however, cases with minimum follow-up of 6 months only were included. The follow-up ranged from 6 months to 40 months (mean, 12 months). In 37 of the 39 children (95%), there was improvement in symptoms and signs as reported by parents and also on clinical examination. Where possible, saline irrigation was performed on every visit and in children not cooperative for irrigation the result was assessed by examination of the meniscus height, regurgitation test and dye disappearance test. None of the patients had any anaesthesia or surgery-related complications.

Discussion

Children constituted 3.66% of patients undergoing external DCR in a large series of 1200 external DCRs performed by a single oculoplastic surgeon. Probing is highly successful in children with simple (membranous) obstruction and remains the first line of management for congenital nasolacrimal duct obstruction. Intubation^{7,8} of the nasolacrimal duct system has been advocated as an alternative to DCR in children in whom probing is not successful. Silicone intubation is also indicated in cases where probing that seems to go well failed to clear the symptoms of epiphora.⁹ The prognosis for intubation, however, has been reported to be poor in patients with previous dacryocystitis and in patients with complicated obstruction noted during intubation.⁹ The causes of probing and intubation failure are thus similar in children with complex obstructions associated with chronic dacryocystitis, and DCR remains the only effective treatment in these children.

All children in this study had chronic dacryocystitis. The reported success rate for major lacrimal surgery in children has ranged from 78.9% to 96%.⁹⁻¹¹ Welham and Hughes¹⁰ and Hakin et al¹¹ reported good success rate suturing both anterior and posterior flaps for paediatric DCR. The modification in this study was suturing large anterior flaps from the sac and nasal mucosa, while excising the posterior lacrimal sac flap. Also, none of the children had silicone intubation. To the best of the author's knowledge this is the first reported study of anterior flap DCR for paediatric nasolacrimal duct obstructions.

Few children with nasolacrimal duct obstruction ever require a DCR. Contrary to the belief that paediatric DCR is less successful than in adults because of less well-defined anatomy, rapidly

growing facial bone centres, and a tendency to develop scar tissue more easily; when the procedure is needed, the success rate for paediatric DCR is actually similar to that seen in adults. Success is equally good with suturing the anterior flaps of the lacrimal sac and nasal mucosa. The role of silicone intubation in primary DCR seems questionable, but needs further study.

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