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Modified Ipswich Procedure: patient-perceived benefit and surgical outcomes in a series of ten patients

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Five Key Points

- Conjunctivodacryocystorhinostomy (CDCR) with Lester Jones tube insertion is performed for proximal nasolacrimal obstruction resistant to other treatments

- CDCR is performed infrequently when compared with standard DCR and Quality evidence on the effectiveness of CDCR is lacking.

- A case series with objective and subjective outcome measures demonstrates good long term success rates

- A new adaptation using a tubed mucosal flap is described

- CDCR is an effective treatment but has a higher complication rate than DCR the most common being tube extrusion.

Introduction

Acquired nasolacrimal duct obstruction (NLO) causes symptoms of epiphora which can be associated with stickiness, dacryocystitis and interference with tear film causing visual blurring [1]. The annual incidence rate of NLO is 20 per 100,000, with the majority of patients being females above the age of 66 years [2]. While the aetiology is usually unknown, the site of obstruction is more commonly distal and invariably amenable to treatment by DCR surgery [3-4]. Proximal NLO at the level of the cancaliculi is less common but may still be treatable by extended DCR techniques including canalulostomy. In patients with upper system atresia, or who have acquired obstruction unresponsive to DCR techniques, a conjunctival DCR (CDCR) may be the only other option.

External dacrocystorhinostomy was first described in 1904 by Toti and multiple adaptations have since been developed [3]. The endonasal approach was introduced by Caldwell in 1893 [3], and has regained popularity since the 1980's following coupling of the technique

with the sinus endoscope. Current literature shows comparable success rates of the endoscopic technique with external DCR and has the advantage of avoiding an external scar [3].

Conjunctivodacryocystorhinostomy (CDCR) with Lester Jones tube insertion was first described in 1962 for non-reconstructable lacrimal canalicular obstruction [4]. The lacrimal system is bypassed and a pyrex tube is introduced into the newly created passage between the medial conjunctival fornix and the lateral nasal wall. The standard CDCR described by Jones was an external procedure using a skin incision to create the bony osteotomy. In 2000, Trotter et al reported an endonasal approach demonstrating similar outcomes [5].

More recently Yung et al have described an endoscopic technique (Ipswich procedure) where an initial endoscopic DCR is converted into a CDCR by forming a fistula from the medial conjunctival fornix which is lined with a superiorly based septal flap [8]. Rather than healing by secondary intention as described by Jones, this confers the advantage of providing a mucosal lining to the fistula.

In this article we describe our experience using Yung's modification of CDCR and describe the additional option a tubed flap based on the lateral nasal wall.

Aim

The aim of this study was to review our CDCR patients outcomes and to describe a simple modification of the Ipswich procedure.

Methods and Materials

Ethical Standards:

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

The study was a retrospective case-series conducted at a single institution from April 2005 to April 2015. Ten patients (11 eyes) who underwent CDCR with insertion of a modified Jones tube by one of two surgeons were included in the study. All patients underwent the operation using one of the surgical techniques described below. A data collection proforma was used recording standard demographics as well as the aetiology of the nasolacrimal obstruction and past medical history. Complications were categorised into intraoperative and post-operative.

The objective success was evaluated by performing an endoscopic fluorescein dye disappearance test (FDDT) at a postoperative clinic. Spontaneous outflow from the Jones tube at nasendoscopy upon instillation of fluorescein eye drops was defined as objective success. The FDDT was performed at the first follow up appointment and then repeated at 1 year postoperatively. Subjective success was assessed using a visual analogue score for pre and post operative symptoms of epiphora and patient benefit was assessed using the Glasgow Benefit Inventory (GBI). The patient reported outcome measures (PROMS) were

recorded for 8 patients and were carried out at a mean time of 4 years and 1 month after surgery (range 5 months to 12 years). Statistical analysis was performed using STATA13 software (StataCorp LP, College Station, TX, USA).

Patient 1-7 had the traditional Ipswich procedure, patients 8-10 had the modified Ipswich which is described below.

Surgical Technique (Modified Ipswich procedure)

The operation is performed under general anaesthetic in a hypotensive field. The nose is prepped with 1/1000 adrenaline patties placed into the middle meatus and local anaesthetic and adrenaline (lignospan special, lidocaine 2% with 1mg in 1/80,000mls adrenaline) injected into the middle turbinate and lateral nasal wall. An endoscopic DCR similar to that described by Wormald [10] with extensive removal of bone is performed using 2 mm Kerrison bony rongeur and a DCR drill. This is converted to CDCR by excising the caruncle at the medial conjunctival fornix and using this wound to create a fistula from here through into the lateral wall of the lacrimal sac. This is done under endoscopic guidance using a 3mm gold Jones trocar. The fistula is stretched to a diameter of at least 4-5mm using a pair of mosquito artery forceps. A superiorly based mucosal flap can either be sourced from the septum as described by Yung [6] or as a long agger flap which is now our preference. (Figure 1). The flap is delivered through the rhinostomy to the medial canthus using a "pull-through" suture (Figure 2), this is grasped by mosquito forceps delivered through the fistula via the medial conjunctival fornix. The free end of the mucosal tube is then anastamosed to the conjunctival end of the fistula, which consists of the remnant of the caruncle medially and tarsal conjunctiva laterally. A looped silicone stent (Figure 3) is passed and left in place for 3-4 weeks. The patient the reattends for O'Donohue tube removal and the fitting of an appropriate length Lester Jones tube. For the initial 5 cases of the cohort we did perform a second procedure to divide the pedicle. However as it became apparent during the second

procedure that the flap pedicle atrophied into a thin fibrous band and did not appear to interfere with nasal function, for the remainder of the cohort the flap base was not divided. Persistence of the flap base in these cases was not associated with any late complications such as crusting. Thereafter patients attended for follow up at 3 months and then annually. Any patients noted to have biofilm obstruction of the tube at follow–up had the tube syringed with saline during their clinic attendance. The need for tube replacement was assessed at annual follow-up, tubes were not replaced routinely. Patients with any conjunctival reaction to the tubes were listed for tube replacement.

Results

A total of 11 eyes in 10 patients were treated with CDCR using the technique described above (one patient underwent bilateral surgery). The mean age at operation was 44.6 years (Min=11, Max=67), with the mean age at PROMS being 55 years (Min=26, Max=72). There were 4 males and 6 females. The indication for surgery was constant epiphora and upper system nasolacrimal obstruction resistant to other treatment. Four patients had upper lacrimal system obstruction secondary to infection. One patient had the lacrimal system sacrificed as part of nasal tumour resection, one had obstruction secondary to a previous post operative complication. One patient had a congenital absence of the lacrimal punctum and the remaining patients had developed acquired upper system obstruction without identifiable predisposing factors.

Four eyes had acquired proximal bicanalicular block. Five eyes had common canaliculus obstruction and one eye had functional duct obstruction. Bilateral involvement was seen in one patient. Seven patients had a history of persisting symptoms after a previous DCR.

Following the operation 10 eyes had patent tubes on syringing with surgical success was achieved in (90.9%). Two of the patients did not complete the VAS and GBI assessments. The mean post-operative VAS was significantly lower than the pre-operative value 7.8 (1.3 SD) to 2.4 (2.3 SD) mean improvement 5.4 (3.0 SD), $p<0.001$ and the mean GBI was 29.1 (21.1 SD). Table 1.

Minor surgical complications related to the procedure were noted in 8 eyes (72.7%). Tube extrusions were seen in 4 eyes (36.3%). Two patients developed bacterial conjunctivitis postoperatively which was successfully treated with chloramphenicol drops. The unsuccessful procedure occurred in a patient who developed a canthal contracture secondary to excessive scarring from three previous DCRs and the CDCR. The same patient had three tube extrusions. One patient who underwent a previous nasal reconstruction following a tumour resection complained of a low level discomfort in the eye. In terms of long term need for tube replacement only one patient required this when after 7 years she developed a conjunctival reaction around the tube flange, this resolved following relocation of a new Lester-Jones tube. The need for regular tube replacement once tube position was established was otherwise not a feature for this cohort.

Discussion

The success rates of CDCR reported in literature and defined as resolution of symptoms vary from 57-100% [7]. Endonasal DCR is a successful intervention with demonstrable health benefits to the patients. Glasgow Benefit Inventory scores for standard DCR vary from 15.0 to 32.7 [8].

Due to the small number of CDCR procedures carried out in most centers, the information available on success rates and complications is limited. The complication rate is generally higher than standard DCR, and includes tube extrusion (10-82%) [7], tube obstruction and infection of the fistula. In our study, the objective success of the procedure by fluorescein appearance test was 91% which is similar to the previously reported results [7]. Given the primary aim of treatment is quality of life improvement, the importance of assessing outcome using PROMS cannot be underestimated in lacrimal surgery. In this series the patient benefit score by GBI (29.1) was also comparable with the results reported in the literature and with those for DCR surgery. As well as the GBI the Lac-Q questionnaire is useful and more specific for lacrimal surgery based on eye-specific and social impact scores [6].

The standard Ipswich procedure described by Yung et al was used for the first 8 operations. A modified approach as described above in the methods was used latterly. One of the disadvantages of the Ipswich procedure is the thick adhesion caused by the base of the septal flap which forms a mucosal bridge between the septum and the rhinostomy. The laterally based mucosal flap avoids this complication. The added benefit of the lateral flap is that you have the septal flap as a backup if you encounter problems. There were no flap failures in this series. The main benefit of using a mucosal flap to line the fistula appears to be that once a stable Lester Jones tube placement is achieved, the prosthesis requires very little care, and the need for replacement in our cohort was rare with only one patient in the group requiring replacement so far and this was after 7 years of good symptom control.

The main limitations to our study design were the small sample size and the long period of patient recruitment during which our surgical technique underwent modifications. The answers to PROMS were collected at variable times following surgery and, therefore, some of them could be subject to recall bias.

Conflict of Interest:

None declared.

References

1. Bartley G.B. (1992) Acquired lacrimal drainage obstruction: an etiologic classification system, case reports, and a review of the literature. Part 1. Ophthal. Plast. Reconstr. Surg. 8(4), 237-242.

2. Woog J.J. (2007) The incidence of symptomatic acquired lacrimal outflow obstruction among residents of Olmsted County, Minnesota, 1976-2000 (an American Ophthalmological Society thesis). Trans. Am. Ophthal. Soc.105, 649–666.

3. Huang J., Malek J., Chin D., et al. (2014) Systematic review and meta-analysis on outcomes for endoscopic versus external dacryocystorhinostomy. Orbit. 33(2), 81-90.

4. Jones L.T. (1962) The cure of epiphora due to canalicular disorders, trauma and surgical failures on the lacrimal passages. Trans. Am. Acad. Ophthalmol. Otolaryngol. 66, 506–510.

5. Trotter W.L., Meyer D.R. (2000) Endoscopic conjunctivodacryocystorhinostomy with Jones tube placement. Ophthalmology. 107(6), 1206–1209.

6. Yung M.W., Hardman-Lea S. (2003) Ipswich lacrimal tube: pedicle nasal septal tube for the reconstruction of lacrimal drainage passage, J. Laryngol. Otol, 117(2), 130–31.

7. Athanasiov P.A., Madge S., Kakizaki H., et al. (2011) A review of bypass tubes for proximal lacrimal drainage obstruction. Surv. Ophthalmol. 56(3), 252–266

8. Jutley G., Karim R., Joharatnam N., et al. (2013) Patient satisfaction following endoscopic endonasal dacryocystorhinostomy: a quality of life study. Eye. 27(9), 1084-1089.

9. Mistry N., Rockley T.J., Reynolds T., et al. (2011) Development and validation of a symptom questionnaire for recording outcomes in adult lacrimal surgery. Rhinology. 49, 538–545.

10. Wormald P.J., Tsirbas A. (2009) Powered endoscopic dacryocystorhinosotmy with mucosal flaps. Operat. Tech. Otolaryngol. Head Neck Surg. 20(2), 92-95.

Table 1 Surgical outcomes

PATIENT NUMBER	AETILOGY	SURGICAL TECHNIQUE	FDDT	VAS IMPROVEMENT	GBI	COMPLICATIONS
1	Acquired (Infection)	Superior based septal flap	Yes	0	38.9	Tube displacement, Eye irritation, adhesions
2	Acquired	Superior based septal flap	Yes	3.4	44	Tube displacement, bacterial conjunctivitis, Granulations at lateral side
3	Acquired (Post-operative)	Superior based septal flap	Yes	5	22.2	Eye discomfort, Lester Jones tube replacement twice (scarring)
4	Acquired (Cicatricial)	Superior based septal flap	No	6.5	-5.6	3 tube extrusions
5a	Acquired	Superior based septal flap	Yes	1.5	42	Necrotic posterior septum. 3 tube extrusions
5b	Acquired	Superior based septal flap	Yes	1.5	42	none
6	Acquired	Superior based septal flap	Yes	0.4	47	none
7	Congenital	Superior based septal flap	Yes	N/A	N/A	Multiple extrusion
8	Acquired (Infection)	Agger flap	Yes	3	0	Tube extrusion and replacement
9	Acquired (Infection)	Agger flap	Yes	0.2	44	none
10	Acquired	Agger flap	Yes	N/A	N/A	Mobile tube, replaced after one year