Original Article

Endoscopic Dacrocystorhinostomy: A Pakistani Experience

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Purpose: To surgically create a new passage for the lacrimal fluid to flow into the nose from the eye using the endoscopic technique.

Material and Methods: Endoscopic dacrocystorhinostomy (DCR) was performed on selected patients (n=16) using a 4mm zero and 30 degree nasal endoscope and a camera system .The puncta dilated with punctum dilator and probing done before passing a light probe by ophthalmologist to enter the lacrimal system while the ENT surgeon created a window medial to the lacrimal sac through bone and into the sac via the corresponding nostril. Silicon (Jones) tubes were used as stents and left in situ for six months. A regular follow up plan continues till eight months.

Results: Seven males (43.8%) and nine females (56.3%) under went endoscopic DCR with their ages ranging from 10 to 67 years. All patients had epiphora, mostly in the left eye (43.8%).

Out of all, 37.5% of the patients had a deflected nasal septum towards the side of surgery while only 6.3% (septoplasty or SMR) had to have their septum corrected before DCR could proceed. Only two patients needed trimming of their middle turbinates to make more room for surgery. Allergic rhinitis was common (25%) and so were itchy eyes (50%).All patients were relieved of their symptoms postoperatively (100%) two months post removal of the silicon tubes.

Conclusion: DCR should be done endoscopically now which gives no facial scars and is a safe and effective procedure (in the hands of an experienced surgeon) with a low morbidity and mortality. However, formal training is mandatory.

Dacrocystorhinostomy has been a procedure which has seen a number of modifications since the first one done by Toti[1] in 1904 and later the intranasal version was carried out in 1989 by McDonough and Meiring[2].

Dacrocystorhinostomy consists of creating a new surgical channel from the eye into the nose to overcome the blockage in the lacrimal sac or the lacrimal duct. This surgery was traditionally performed by the ophthalmologists who took an external route into the nose. The emergence of the Hopkins rod telescope has provided the otolaryngologists the opportunity to use the camera system to visualize the medial aspect of the lacrimal sac from within the nose and thus avoid excessive tissue damage. However, ophthalmologist defined the upper lacrimal passages by passing fiber optic light probe up till obstruction, which helps the otolaryngologist to visualize and perform the procedure endoscopically.

The obstruction whether it is due to congenital or acquired reasons such as trauma, infection or iatrogenic in nature can be divided into obstruction before the sac, at the sac and beyond the sac.

The puncta are 0.3mm in diameter and are about 6mm from the medical canthus. The upper and lower cannaliculi are lined by non keratinized stratified squamous epithelium so that they can be dilated to about 2 to 3 times their diameter. The lacrimal sac is about 15mm in its vertical extension. The nasolacrimal duct is about 17mm long and opens into the inferior meatus of the nose.

There is a valve at the junction of the lacrimal sac (Rossenmuller) and the nasolacrimal duct. There is one at the lower end as well in the opening of the lower meatus (Heisner). This helps to prevent lachrymal reflux.

The blockage can be detected by either a fluorescein test or a dacrocystogram. However, syringing and probing is mandatory to assess the level of obstruction.

There are two schools of thought world over, ones who believe in stenting and ones who do not[3, 4]. We follow the former. A silicone tube is placed as a loop in the two cannaliculi and the two ends are tied together in the nose. This is left in situ for six months.

The aim of presenting our experience is to show that endoscopic dacrocystorhinostomy is the way forward now and should be the usual way of carrying out this surgery.

MATERIALS AND METHODS

Patients whose lacrimal system did not clear with at least three attempts at syringing by the ophthalmologists (A.HA, MT) were advised an endoscopic dacrocystorhinostomy. The patient was referred to the otolaryngologist (S.A) after a computerized tomogramphy scan of the paranasal sinuses according to the FESS (functional endoscopic sinus surgery) protocol.

An initial nasal endoscopy of the nose was carried out under local anesthesia to ascertain the surgical anatomy of the nose on the side of the proposed surgery and point out any hindrances and anatomical abnormalities.

The surgery is carried out under hypotensive general anesthetic and the nose is extensively prepared preoperatively with xylometazoline 0.5% (5 sprays on the side of surgery) and further neurosurgical patties are soaked in 1:1000 adrenaline and placed at specific sites in the nose especially the mucosa overlying the frontal process of the maxilla) just anterior to and level with the axilla of the middle turbinate.

The ophthalmologist (A.H.A, M.T) uses the lacrimal probe to assess the patency of the superior, inferior and common cannaliculi and enters the punctum of either of the lids usually with a punctum dilator. Subsequently, a fiber optic light carrying probe replaces the punctum dilator and after negotiating its way through the cannaliculi and the common canaliculus enters the lacrimal sac. The otolaryngologist (S.A) dims the intensity of the light of his endoscope (zero or 30 degrees 4mm 18cm) which enables the external probe light to give a glow inside through the lachrymal bone at the site of the lachrymal sac.

The otolaryngologist pin points the area of interest and after an injection of the local anesthetic, the mucosa is incised and removed using a keratome at the site of the lachrymal sac. The author (S.A) prefers to remove the mucosa rather than develop a small flap. The site of the lachrymal sac is slightly anterior to the root of the middle turbinate for which a Stammberger backbiter or at times a drill (depending on the thickness of the bone) is used to remove the hard and thick frontal process of the maxilla overlying the lachrymal sac.

Subsequently, the light probes now show quite a bright glow and are used to tent the medial wall of the lachrymal sac. Again, a keratome incises the whole vertical length of the sac which at times lets loose a considerable quantity of pus into the wound. The authors prefer to remove all the sac walls rather than just the medial incision and stenting.

The silicon tube (DCR tube) is now passed through the puncta and into the nose through the empty area previously occupied by the lachrymal sac. The two tubes in the nostril are tied together several times making sure there is no possibility of these getting loose.

The surgery site is lightly packed which is removed the following day.

Postoperative drugs include antibiotics for 7 days, oral steroids for 7 days, decongestant nose drops and antibiotic drops in the eye. There is hardly any postoperative pain of significance.

The patient is sent home the next day and called for follow up after one week. The subsequent follow up visits are at two, four, six and finally eight months.

The tube is removed by the otolaryngologist after six months and an endoscopic examination is carried out for documentation at the same time.

RESULTS

We present our experience on sixteen patients who under went dacrocystorhinostomy. There were seven males (43.8%) and nine females (56.3%) with a mean age of 45 years. The age minimum was 10 years and maximum was 67 years.

Side of DCR

		Frequency n (%)	Valid Percent	Cumulative Percent
Valid	Lt. DCR	9 (56.3)	56.3	Valid
	Rt. DCR	5 (31.3)	31.3	
	Both DCR	2 (12.5)	12.5	
	Total	16 (100)	100.0	

DNS surgery done

		Frequency n (%)	Valid Percent	Cumulative Percent
Valid	None	14 (87.5)	87.5	87.5
	Septoplasty done	1 (6.3)	6.3	93.8
	SMR done	1 (6.3)	6.3	100.0
	Total	16 (100)	100	

Age

		Frequency n (%)	Valid Percent	Cumulative Percent
Valid	10.00	2 (12.5)	12.5	12.5
	35.00	1 (6.3)	6.3	18.8
	36.00	1 (6.3)	6.3	25.0
	38.00	1 (6.3)	6.3	31.3
	40.00	1 (6.3)	6.3	37.5
	43.00	1 (6.3)	6.3	43.8
	50.00	2 (12.5)	12.5	56.3
	54.00	1 (6.3)	6.3	62.5
	56.00	2 (12.5)	12.5	75.0
	58.00	1 (6.3)	6.3	81.3
	62.00	1 (6.3)	6.3	87.5
	65.00	1 (6.3)	6.3	93.8
	67.00	1 (6.3)	6.3	100.0
	Total	16 (100)	100.0	

Gender

		Frequency n (%)	Valid Percent	Cumulative Percent
Valid	Male	7 (43.8)	43.8	43.8
	Female	9 (56.3)	56.3	100.0
	Total	100	100	

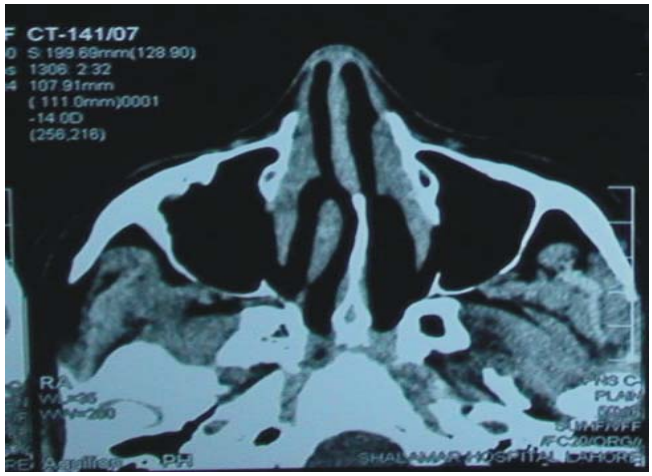

Fig 1. Nasolacrimal ducts: Blocked on the left side and patent on the right (Coronal view of the face done with the FESS protocol)

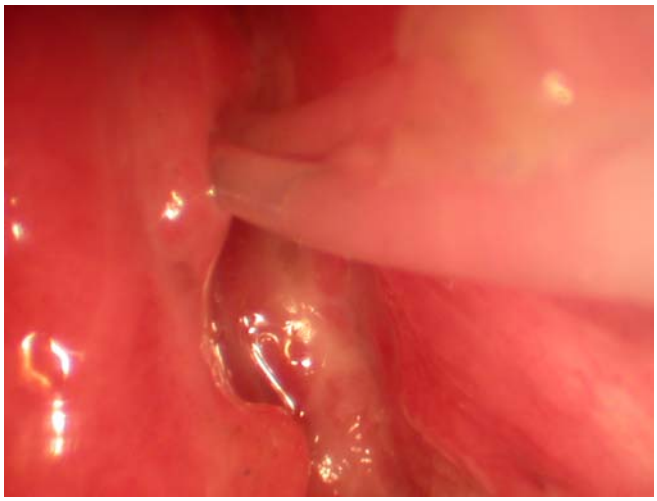

Fig.2. Right DCR. (Post op two weeks)
Lacrimal sac area is clear with both DCR tubes insitu.

The duration of the symptoms was 6 months to two years.

Most of the DCR procedures were carried out on the left side (56.3%).

In this series, most of the patients had the epiphora in their left eye (43.8%) with more females[4] than males while 4(25%) patients had watering in both the eyes, again the females were in the majority.

Out of all the patients most (12, 75%) did not present with a mucocele while there were two each found in the male and female categories.

Almost 88% did not have any postoperative bleeding. The nasal bleeding we did encounter was as a mild trickle in the patients who had to undergo corrective septal surgery (which is expected) or trimming of the middle turbinate.

In 37.5% of the patients there was a deflection of the nasal septum on the side of the DCR while only 6.3%, which is one patient, underwent a septoplasty and another one a sub mucous resection of the septum.

There was no need to trim back the anterior end of the middle turbinate on the side of the surgery in the majority (87.5%) of the patients and only two patients out of the lot had their middle turbinates trimmed to make room for the saccal surgery.

Out of the total number of patients, 25% had an allergic rhinitis while 50% complained of itchy eyes, more in the females[9] than the male patients[7].

In our study 100% were symptom free at the eighth months post-surgery and removal of the silicon tubes. There were no patients with a stenosis.

DISCUSSION

Endoscopic DCR should be the usual way of creating a new channel between the lacrimal sac and the nose in case of a lacrimal blockage, however; open surgery is still the norm in Pakistan and even in the UK. However, our attempts to find a paper, or a report from Pakistan (Pakistani journals and Pub Med) on endoscopic dacrocystorhinostomy failed.

Females have been in majority (56.3%) in this study which is the usual consensus in several studies [5] which perhaps points towards long term cosmetic effects on the eyes.

DCR is a safe procedure and despite some mild anterior nasal trickle (which is the norm in septal surgery) or slight adhesions or ecchymosis around the eye in one patient, we have not faced any major complications.

In a study by Küpper[6] et al (2005), the commonest complication they came across was ecchymosis around the eye and slight adhesions. Our study had the same complication (ecchymosis) which was of almost of no consequence. The ecchymosis resolved itself leaving no lasting effects and the mild adhesions were slight enough not to merit any treatment.

Rasan[7] et al (2008), in Malaysia also concluded that the endoscopic DCR is "an easy, efficient treatment for nasolacrimal duct obstruction with minimal complications."

Eloy[8] et al in 1995, favoring the endoscopic route, claimed, it to be less traumatic to all surrounding structures especially to the medial canthal anatomy.

A study by Unlu[9] et al. (2002), with 25 patients in 4 years had 2 patients with ecchymosis around the eye. Similarly, the rate of ecchymosis in our study was quite low as well where we had only one 65 year old lady with difficult punctual dilatation resulting in ecchymosis around the eye which settled within a week.

A randomized controlled trial run by Hartikainen[10] et al. in 1998 in Finland carried out DCR procedures on 60 patients over a period of fifteen months out of which 6.25% of the patients required a nasal packing and hospital readmission for three days for excessive nasal bleeding. In the present study as well the postoperative bleeding rate was quite low (3 patients) however, none required nasal packing or hospital readmission.

Again in experienced hands, like Wormald[11] (2002), in Australia (36 patients in 30 months) had only one patient who had obliteration of the sac postoperatively while Yung[12] (2002), in the UK (170 patients, 6 years) reported no complications at all.

In our study at the end of the eighth follow up month there were no symptomatic patients. Results close to the ones reported here have been cited in the world literature which rages from 80-99%. Sham[13] et al (2000) performed 17 DCRs and claimed a success rate of 88% with 7 revision procedures. Weidenbecher[14] et al (1994) showed a success rate of 79.12%.They supported our results as far as a low morbidity and safety of this procedure is concerned.

There are several advantages of the endoscopic technique over the open one. The most important one is avoidance of a facial scar. Other problems associated with the open technique such as excessive bleeding are also avoided while both sides can be operated upon at the same time. Postoperatively, nasal endoscopy is an excellent technique to assess the operative results.

The Royal College of Ophthalmologists advises that endoscopic DCR with a laser is less efficacious (success rates of 77-83%) which can cause serious complications such as infection and loss of sight. It is our experience as well that a laser, unnecessarily lengthens the time of the surgery and its use is best avoided.

Onerci[15] et al. (2000), in Turkey, conducted a study in which experienced surgeons carried out surgery on 108 patients and inexperienced surgeons operated on 50 during a period of 8 years.

They compared the performance of the two groups carrying out endoscopic DCRs and reported 11 complications by the experienced surgeons and 21 by the inexperienced surgeons.

Thus, it is imperative to undergo formal training in endoscopic nasal surgery and then in its advanced applications such as endoscopic DCR. It is important to thoroughly assess the patient preoperatively and take the patient through a standard follow up schedule.

CONCLUSIONS

DCR should be done endoscopically which is a safe and effective procedure with a low morbidity and recurrence. It avoids the scar on the face and more ENT surgeons should under go formal training in this technique.

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