

Role of endoscopic DCR with stenting in cases of presacal obstruction: a prospective study



Medical Science

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ABSTRACT

Management of epiphora due to presacal obstruction in lacrimal drainage system has always been difficult. Different surgical procedures have been tried in past for the same with varying results. Wehere present our experience of management of all patients with presacal obstruction by a single standard surgical technique. It is a prospective study comprising of 32 cases (34 eyes) presenting in our institute from January 2008 to December 2013. The location of obstruction was distal canalicul in 28 eyes, mid canalicul 3 eyes, proximal lower canalicul blockage in 1 eye and 2 eyes had acquired punctal stenosis. All cases underwent endoscopic DCR with bicanalicul silicone stent placement. The mean follow up period after stent removal was approximately 13months. The success rate of primary surgery was 88% where as the success rate following second surgery was 94%.

Introduction:

Epiphora is a distressing symptom. It occurs due to obstruction in lacrimal drainage system and such cases are commonly encountered by otolaryngologists and ophthalmologists. Lacrimal drainage apparatus is divided into proximal and distal sections. The proximal section includes punctum, canaliculus and common canaliculus whereas the distal drainage system consists of lacrimal sac and nasolacrimal duct that finally opens into the lateral nasal wall below inferior turbinate (1).

We would like to share our experience of endoscopic management of 32 cases (34 procedures) of obstruction of proximal lacrimal drainage system in our institute. In view of the literature searched and to best of our knowledge this study is first of its kind where endoscopic dacryocystorhinostomy (DCR) with bicanalicul stent placement was done for proximal system obstruction.

Material & Methods:

Present study was conducted in department of Otolaryngology of SGRR institute of Medical and Health Sciences, Dehradun. It is a prospective study comprising of 32 cases (34 procedures) with clinically troublesome epiphora due to obstruction of proximal lacrimal drainage system presenting in ENT OPD between January 2008 and December 2013. The diagnosis was established by irrigation and probing of passages followed by dacryocystography (figure 1 –A).

Figure 1 a: dacryocystogram (both eyes). Right eye depicts common canalicul obstruction with failure of passage of dye into lacrimal sac (solid white arrow), and collection of dye in conjunctival sac due to spillage. Left eye shows distension of lacrimal sac (thin white arrow) and obstruction at level of Krause's valve with failure of passage of dye into nasolacrimal duct. **b:** Intraoperative picture (left eye) depicting endoscopic DCR with silicone stent placement (solid white arrow). **c:** Endoscopic picture of right nostril taken 1 year following surgery, it shows a patent rhinostomy site (black arrow)



There were two cases of acquired punctal stenosis (PS) rest all cases were of canalicul obstruction. Canalicul obstructions were anatomically classified as: proximal canalicul blockage (PCB) with involvement of the proximal 2-3mm, mid canalicul blockage (MCB) 3-8mm from the punctum, and distal canalicul blockage (DCB) as membrane at the opening of the common canalicul to lacrimal sac (2). All the cases underwent endoscopic DCR followed by probing and silicone stent intubation (figure 1-B). Stent was removed after 6 months following surgery in majority of cases and results were tabulated after 6mths of stent removal.

Surgical technique:

All procedures were performed under general anesthesia and all cases underwent opening of lacrimal sac by standard endoscopic DCR technique. A posteriorly based mucosal flap was elevated to expose the frontal process of maxilla. Lacrimal sac and upper duct was exposed by removing the bone at frontal process of maxilla (using a Kerrison bony rongeur/ otologic drill) going as high up under the middle turbinate as possible. This step is important as inadequately removed bone will pose problems in proper exposure and visualization of internal opening of common canaliculus and in insertion of stent. Medial wall of sac and duct were opened with help of disposable angled keratome. Interior of sac was examined by endoscope, any fibrosis or granulations within the sac were removed. The internal opening of common canaliculus was identified using 30 degree endoscope. Following punctal dilation the level of obstruction was confirmed by intra-operative probing with a 2-0 Bowman probe which was advanced until a soft stop was encountered and the distance of stenosis was measured. For patient with punctal stenosis punctal dilatation was done and lacrimal probe was negotiated to canaliculi thereby syringing was done and stent was inserted. For proximal and mid canalicul obstructions probe was gently negotiated through the soft stop in direction of common canalicul guided by ball probe inserted intranasally into the common canalicul opening, whereas the distal canalicul obstructions could be cleared by retrograde probing from the sac. This was followed by insertion of standard silicone stents (0.64 mm outer diameter, 22cm length) passed through the canaliculi into the sac and tied intranasally. Raw bone was covered with the nasal mucosal flap. Thereby light anterior nasal packing was done which was removed within 24 hours. Regular endoscopic suction clearance was done to remove all the crusts, release synechiae if present, and to assess the stent site. Patients were thus called weekly for a month, then once a month for 6 months and thereby after 6 months. All stents were removed after 6 months following surgery, except two patients who pulled

out their tube by mistake. The results were assessed at 6 months following stent removal in all cases and thereby on subsequent visits (figure 1-C).

Results:

Clinical profile of the cases studied is depicted in table 1.

Table 1: Comprehensive clinical data

Abbreviations: FDCR failed endoscopic DCR; FEDCR Failed external DCR; PT post traumatic; MMA middle meatus anastomostomy; Fa failure.

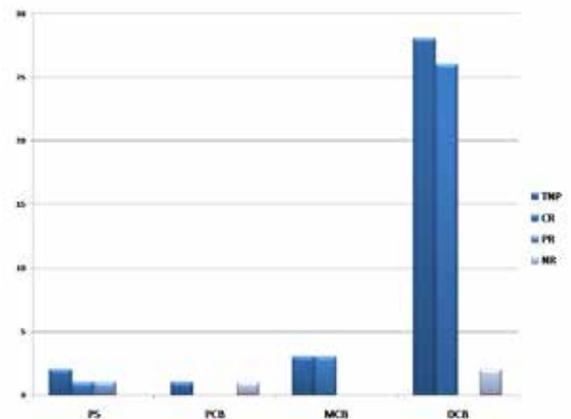
Case	Sex	Age (yrs)	Eye	Site	Remarks	Additional Procedure	Surgical result	Follow-up period
1	F	36	R	DCB				1.5y
2	F	45	L	DCB				10m
3	F	80	L	DCB				8m
4	F	65	R	DCB				1y
5	F	35	L	MCB				2y
6	M	60	R	DCB	Encysted mucocele			11m
7	M	18	L	DCB		Septoplasty		1y
8	F	60	L	DCB				1.5y
9	F	45	R	DCB				2y
10	F	32	L	DCB		Septoplasty		8m
11	M	60	R	DCB	FEDCR			6m
12	F	50	L	PCB	PT		Fa	9m
13	M	59	L	DCB				1y
14	M	11	L	DCB	FDCR			11m
15	F	55	R	DCB	FEDCR	Septoplasty		1y
16	F	34	BE	RPS; LMCB			Fa(R)	2y
17	F	70	L	DCB		MMA		11m
18	M	47	R	DCB				1y
19	F	27	L	DCB	FEDCR		Fa	1.5y
20	F	30	R	DCB	FEDCR			2y
21	M	6	R	DCB			Fa	11m
22	F	25	BE	LDCB; RMCB				1y
23	F	24	L	DCB				9m
24	M	32	L	DCB	PT			1y
25	F	58	R	DCB				11m
26	M	9	R	DCB	PT; encysted mucocele			10m
27	F	35	R	PS				9m
28	M	54	R	DCB				11m
29	F	28	R	DCB				11m
30	F	55	L	DCB				8m
31	F	46	R	DCB				10m
32	F	27	L	DCB				8m

There were 32 patients who underwent 34 procedures. Ten patients were males and twenty two were females of which two required surgery for both eyes. Their age ranged from 6 to 80 years. All cases underwent endoscopic DCR with bicanalicular silicone stent placement. The location of obstruction was DCB in 28 eyes, MCB in 3 eyes, PCB (lower) following trauma in 1 eye and 2 eyes had PS. DCB patients included 2 post traumatic cases, 5 cases of failed DCR (4 external, 1 endoscopic), 2 cases of encysted mucocele of which one was post traumatic. The failed DCR cases when evaluated had excessive fibrosis in sac and at canaliculo-sac junction. Both the cases of PS had an acquired punctal stenosis. Three patients required septoplasty for their deviated nasal septum and one required middle meatus anastomostomy for associated sinusitis. Stent was well tolerated by pa-

tients and was removed after 6 months in 30 patients whereas in 2 cases it got accidentally removed by patients in 2nd and 4th week respectively. There were no major complications following surgery. Synechiae formation was seen in 9 cases and friable pale granulations in early post-operative period in 5 cases which were easily managed during outdoor follow up visit of the patient by endoscopic suction clearance.

Results of surgery were analyzed after 6 months following stent removal in all cases except in two where it got accidentally removed few weeks following surgery (figure 2).

Figure 2: Bar chart depicting surgical outcome according to the level of obstruction; abbreviations: TNP total number of patients, CR complete relief, PR partial relief, NR no relief



The criteria for labeling surgery as successful were absence of epiphora and patency of the rhinostomy site. Rhinostomy patency was assessed endoscopically and by syringing. The primary surgery was successful in 30 out of 34 eyes. Of two cases of PS one was completely successful whereas other was partially relieved of epiphora. Single case of PCB was unsuccessful. All three cases of MCB had complete relief. Out of 28 cases of DCB 26 had complete relief following primary surgery.

Of the failed cases first case was of 50 years female who had post traumatic PCB with uncontrolled diabetes mellitus .She developed extensive granulations at rhinostomy site few weeks following stent removal. She underwent re-exploration and all the granulations were removed, however few weeks later, because of uncontrolled diabetes, the granulations reappeared .Second case was of a 34 years female who underwent surgery for both eyes (left MCB, right PS), her left eye was fine following surgery but she had grade 1 epiphora (Munk scale)in right eye. Endoscopic evaluation revealed anatomically patent passage. Since patient had drastic symptomatic relief following surgery nothing else was done. Third case was of 27 years female who was a case of failed external DCR with DCB. She accidentally pulled out her tube 2 weeks following surgery, thus epiphora reappeared. Fourth case was of 6 years old male child with DCB in whom the stent got removed 4weeks following surgery. Both these failed cases of DCB were taken up for revision surgery; stent was re-inserted and kept for 6 months. They are symptom free now. Thus the success rate of primary surgery was 88% where as the success rate following second surgery in patients where the tubes were accidentally removed was 94%.The mean follow up period after stent removal was approximately13 months.

Discussion:

Dacryocystorhinostomy surgery by intranasal route was first described by Caldwell in 1893 (3).In 1989 Mc Donogh and Meiring

described the endoscopic transnasal DCR (4). Endoscopic DCR surgery techniques are improving day by day and its spectrum is also widening from being solely limited to management of saccal obstruction to even pre-sacal obstruction. There have been studies in past where DCR with silicone tube intubation was used for distal or common canalicular obstruction, and they found that results were superior to the traditional conjunctival DCR with Jones tube or the canaliculo-DCR (5). We further widened the spectrum by undertaking this study of endoscopic DCR with bicanalicular silicone stent intubation comprising of cases of presacal obstruction including patients with acquired punctal stenosis, proximal, mid and distal canalicular obstruction.

The common causes of acquired PS include infections and inflammatory eyelid disorders, ocular surface disease, systemic and topical medications, eyelid tumors and trauma (6). There have been multiple factors associated with canalicular obstructions like congenital anophthalmos, severe microphthalmos, topical anti glaucoma medicines, trauma, and inflammatory diseases (2,7).

Thus all cases of presacal stenosis require a detailed history and proper ophthalmic evaluation. The commonest etiology in our cases was infection followed by trauma. The diagnosis can be established by simple probing and syringing followed by dacryocystography. In our study the location of canalicular stenosis was assessed intraoperatively by grasping punctal end of probe and withdrawing it from canaliculus and thereby measuring the distance; thus dividing them into proximal, mid and distant canalicular obstructions.

Various surgical procedures have been described in literature for management of presacal stenosis depending on its location. PS is commonly treated by punctoplasty. Different methods of punctoplasty are 1, 2 and 3-snip punctoplasty, with mini Monoka tube insertion, microsurgical punctoplasty, laser punctoplasty, externalization of vertical canaliculus under microscopic guidance (8). The treatment of canalicular obstruction depends on level of obstruction. Conjunctivodacryocysto-rhinostomy with Jones tube insertion, DCR with retrograde intubation, silicone stent intubation after lacrimal probing or endoscopic DCR with trephination, Mitomycin-C application, laser canaliculoplasty and balloon catheter dilation have been used for treatment of canalicular obstruction with varying results (9). DCR with intubation for canalicular obstruction has advantages over tradi-

tional conjunctival-DCR with Jones tube or the canaliculo-DCR. Jones tube placement has complications that require replacement, repositioning, and cleaning of tube for indefinite period of time whereas Canaliculo-DCR is a technically difficult procedure with low long term success rate. There have been studies in past where silicone tube intubation was used for treatment of canalicular obstructions. In a study conducted by Khobian et al. canalicular obstruction was treated by trephination and silicone stent intubation. Complete epiphora relief was achieved in 49% cases, partial in 38% whereas no improvement was seen in 13% cases (10). Whereas Baek et al. did a study where endoscopic DCR and lacrimal trephination was done in patients with distal or common canalicular obstruction (9). Complete success was achieved in 80.6% cases, partial success in 12.9%, and failure in 6.5% cases. In our series the overall complete success rate following primary surgery was 88% which further increased to 94% following revision surgery. We would like to say that the improved surgical outcome in our series was probably due to proper surgical technique, regular postoperative endoscopic suction and clearance and keeping the stent in place for appropriate duration.

There are few shortcomings in our series. Firstly lack of appropriate control and secondly site wise surgical success is difficult to evaluate as number of cases is not evenly distributed. However our series has shown good outcome for patients with MCB and DCB.

Conclusion:

Owing to the success rate of our series we would like to state that endoscopic DCR with probing and bi-canalicular silicone stent intubation should be considered as an initial treatment modality for patients with epiphora due to presacal obstruction. It is difficult to compare the success of our series with others as this study is one of its kinds. Moreover lack of standardization of surgical techniques and success criteria in all published series makes the comparison even more difficult.

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