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Original Research Article

A comparative study of endoscopic endonasal dacrocystorhinostomy with and without prolene stenting

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ABSTRACT

Background: Dacrocystorhinostomy is the standard treatment for nasolacrimal duct obstruction. Incision was given at the fronto-nasal process of maxilla and flap was elevated by endonasal approach. Lacrimal bone is removed with Kerrison"s punch, lacrimal sac was identified and clear fluid was released. Intubating the nasolacrimal system during dacryocystorhinostomy (DCR) could prevent osteotomy closure and scarring. Outcomes of endoscopic En DCR with and without prolene stenting.
Methods: All patients with NLD obstruction who have recurrent watering of eyes or dacryocystitis. The study included patients of either sex who had symptoms and signs suggestive of chronic dacryocystitis. It includes a total of 50 patients. There were 21 males and 29 females.
Results: Canalicular irrigation or sac syringing provides essential information about the location of obstruction. Post operatively lacrimal syringing is performed to confirm the patency of the nasolacrimal fistula by directly visualising the flow of saline from rhinostomy opening using nasal endoscopy. In group A syringing was patent in 92% and non patent in 8%. In group B patients syringing was patent in 88% and non patent in 12%.
Conclusions: In this study we compared endonasal DCR outcomes with and without stents in 50 cases of Chronic Dacryocystitis in which prolene was used as a stent in 50% of the randomly divided cases. Based on available data and from literature, we conclude that En DCR is safe and simple.

Keywords: Sac syringing, Prolene stenting

INTRODUCTION

Dacryocystorhinostomy (DCR) is the standard treatment for nasolacrimal duct obstruction.[1] The lacrimal sac is opened by removing the mucosa and the bone between the lacrimal sac and the nose at the region of the middle meatus. The external approach of making an incision in the skin to access the bone, followed by an external osteotomy in which the nasal mucosa is opened and the lacrimal sac flap is created from outside to inside is the conventional method that ophthalmologists prefer.

Endonasal procedures for DCR was described in 1893.[2] "This is best done with an electric burr after passing the probe," Caldwell wrote in his description of making an osteotomy through the nose. However, as described by Toti and Dupuy-Dutemps and Bourguet external DCR was practiced more commonly during the twentieth century as anatomical features became more visible using an open approach.[3,4]

In the 1990s, availability of improved equipment in the form of the rigid fiberoptic endoscope and the movement towards minimally invasive surgery bought a renewed focus on the internal approach.

Additionally, insertion of a light guide into the canaliculus helped to illuminate the surgical site[5]. The

endonasal approach also had the advantage of leaving no external scars and the theoretical advantage of not affecting the orbicularis oculi muscle and preserving the mechanism of lacrimal pump Some advocate its use because it takes less time, bleeds less, has a higher patency rate, does not cause scarring and may correct associated intranasal pathology with same procedure.[6,7]

The most common causes of failure of DCR are osteotomy site obstruction and common canaliculus obstruction. As a result, some authorities hypothesised that intubating the nasolacrimal system during DCR could prevent osteotomy closure and scarring, as well as stenosis of the common canaliculus, and thus improve the success rate. This study compares the outcomes of endoscopic En DCR with and without prolene stenting and evaluates the uses of the prolene as an alternative stenting material in En DCR over a three-month period.

Aim and objectives

Aim and objectives were to compare the results of endoscopic En DCR with and without prolene stent and to assess the clinical efficacy and complications of using prolene as a stent.

METHODS

Source of data

Data collected from Santhiram general hospital, attached to Santhiram medical college.

Study design

It was a hospital based prospective study.

Study period

Study conducted from January 2021 to December 2022

Place of study

Dacrocystitis patients attending to ENT OPD in Santhiram general hospital, attached to Santhiram medical college.

Inclusion criteria

All patients with NLD obstruction who have recurrent watering of eyes or dacryocystitis and do not match the exclusion criteria and patients who have given written and informed consent were included.

Exclusion criteria

Watering due to causes other than NLD obstruction, patients with tumours in lacrimal sac or lacrimal trauma, patients who have uncontrolled DM/HTN, unwillingness to undergo surgery and ineligibility for anaesthesia, revision endonasal dacryocystorhinostomy and dacryocystorhinostomy failed and patients who refused to give informed and written consent were excluded.

Data collection

The study includes patients of either sex who have symptoms and signs suggestive of chronic dacryocystitis and meet the inclusion criteria

Sampling size

Based on last 2 years of admissions of dacryocystitis as inpatients in ENT ward obtained from MRD of SRMC, sample size is 50.

Method of collection of data

A pre-structured proforma was used to obtain data.

RESULTS

Table 1 shows distribution based on age in years where in group A the mean age was- 51.96±11.38 and in group B it was 51.28±12.21. Majority in group A belong to 51-60 years age group followed by 61-70 years and 41-50 years age group. Majority In group B, belong to 51-60 years and 61-70 years age group. This observation was not significant statistically as p calculated 20 to be >0.05.

Table 2 shows distribution based on gender, where 58% were female and 42% were male. In group with prolene stent, 60% were female and 40% were male. In group without prolene stent, 56% were female and 44% were male. This observation was not significant statistically as p value calculated to be>0.05.

Table 3 shows distribution based on laterality, bilateral involvement in 6%, right sided involvement in 46% and left sided involvement in 48%. In group A, 48% each had left sided and right sided involvement, 4% had bilateral involvement. In group B, 48% had left sided involvement, 44% had right sided involvement and 8% had bilateral involvement.

In our study majority of patients (82%) presented with chronic dacryocystitis and 10% presented with mucocoele and 8% presented with pyocele.

During the first week syringing was not done in group A patients due to the presence of the prolene stent and in group B patients syringing was patent in all 25 cases. At 6^{th} week in group A patients syringing was patent in 92% and non patent in 8%. In group B patients syringing was patent in 88% and non patent in 12%. At 10^{th} week and after 3 months in group A patients syringing was patient in 88% and non patent in 12%. In group B patients syringing was patent in 84% and non patent in 16%. This observation was not significant statistically

Table 1: Age distribution.

Age (in years)	Group A, with prolene stent		Group B, without prolene stent		Total	
	N	%	N	%	N	%
27-30	2	8	2	8	4	8
31-40	3	12	4	16	7	14
41-50	5	20	5	20	10	20
51-60	8	32	7	28	15	30
61-70	7	28	7	28	14	28
Total	25	100	25	100	50	100
Mean age	51.96±11.38		51.28±12.21		51.62±11.68	

*Chi square test=0.21, p=0.99, not statistically significant.

Table 2: Gender distribution.

Sex	Group A with prolene stent		Group B without prolene stent		Total	
	N	%	N	%	N	%
Male	10	40	11	44	21	42
Female	15	60	14	56	29	58
Total	25	100	25	100	50	100

*Chi square test=0.08, p=0.77.

Table 3: Laterality.

Laterality	Group A with prolene stent		Group B without prolene stent		Total	
	N	%	N	%	N	%
Bilateral	1	4	2	8	3	6
Right	12	48	11	44	23	46
Left	12	48	12	48	24	48
Total	25	100	25	100	50	100

*Chi square test=0.37, p=0.82.

Table 4: Diagnosis.

Diagnosis	Group A with prolene stent		Group B without prolene stent		Total	
	N	%	N	%	N	%
B/L CDC+Mu	0	0	1	4	1	2
B/L CDC	1	4	1	4	2	4
Lt CDC	10	40	10	40	20	40
Lt CDC+Mu	1	4	1	4	2	4
Lt CDC+Py	1	4	1	4	2	4
Rt CDC	10	40	9	36	19	38
Rt CDC +Mu	1	4	1	4	2	4
Rt CDC+Py	1	4	1	4	2	4
Total	25	100	25	100	50	100

*Chi square test= 1.05, p=0.99, not statistically significant.

Table 5: Syringing.

Syringing		Group A with prolene stent		Group B without prolene stent		P value
		N	%	N	%	
1st week	Patent	25	100	25	100	-
	Non patent	0	0	0	0	-
6th week	Patent	23	92	22	88	0.64
	Non patent	2	8	3	12	
10th week	Patent	22	88	21	84	0.68
	Non patent	3	12	4	16	
3 months	Patent	22	88	21	84	0.68
	Non patent	3	12	4	16	

Table 6: Surgery done.

Variables	Frequency	Percentage (%)
B/L En DCR	2	4.00
B/L En DCR+Pr st	1	2.00
Lt En DCR	12	24.00
Lt En DCR+Pr st	11	22.00
Lt En DCR+Pr st+Sep	1	2.00
Lt En DCR+Sep	1	2.00
Rt En DCR	9	18.00
Rt En DCR+Pr st	11	22.00
Rt En DCR+Pr st+Sep	1	2.00
Rt En DCR+Sep	1	2.00
Total	50	100

DISCUSSION

Epiphora is a common irritating symptom that can embarrass the patient both functionally and socially, and it can even endanger the eye. It differs from lacrimation, which is caused by an imperfect tear drainage through the lacrimal passages. Lacrimation is caused by an excess of tears

Lacrimal surgeries continue to evolve with new technical developments. There is renewed interest in performing DCR through an intranasal approach using modern surgical tools such as endoscope and laser. The two widely accepted modalities of treatment for epiphora resulting from NLD obstruction are endonasal and external DCR.

The present study was conducted to study the results of endoscopic En DCR with and without prolene stenting and in assessing the usage of prolene as an alternative stenting material in En DCR with a 3 month follow up.

This study included patients with recurrent epiphora or dacryocystitis diagnosed with nasolacrimal duct obstruction. 50 patients were divided into two groups. The 25 patients with endoscopic endonasal DCR with prolene stent and 25 patients without prolene stenting.

During the follow up period, a history of epiphora palliation will be recorded to look for complication such as wound infection, gaping or scarring, suture tract formation, punctal eversion, prolapse of tube and cheese wiring of canaliculi. Syringing of the lacrimal system was done and the results were recorded.

Age distribution

Kumar et al observed that the mean age of patients in stenting group (47.1±15.3 years) was lower than the mean age of non-stenting group (51.2±14.5).[8] The study conducted by Baruah et al observed that majority belonged to people aged 41-60 years.[9] Basil et al observed that the maximum incidence of NLD obstruction was in age group of 50- 55 years.[10]

Sarada et al reported that the incidence was highest in fourth decade of life.[11] Baruah et al reported that most of the patients were belong to age group of 41-60 years (47%).[9] Similar results were reported in our study, in which most of patients were in age group of 41-60 year. Duke Elder said the disease primarily affects middle age adults and is rare in adolescents and children.[12] He cited the maximum incidence in 40 years of life.

Gender distribution

Kumar et al observed that ratio of female to male in stenting group was 1.5:1 and the ratio of female to male in non stenting group was 1.77:1 Naik et al observed that the ratio of female to male in group A was 1:1.7 and in group B was 1:1.86.[8,13]

Laterality

Dubey et al stated that left eye was affected in 56 patients compared with 52 patients in the right eye.[8] The 11 patients were bilateral and underwent surgery one eye at a time. Rajesh et al reported that 28 patients (49.1%) had disease on right eye, and 29 patients (50.9%) had disease on left eye.[14]

CONCLUSION

In this study we compared endonasal DCR outcomes with and without stents in 50 cases of chronic dacryocystitis in which prolene was used as a stent in 50% of the randomly divided cases. Based on available data and from literature, we conclude that En DCR is safe and simple Minimally invasive procedure due to direct access to sac Safe to treat mucocele and pyocele. Cosmetically acceptable because there is no external scar. Prolene is non absorbable, retains its strength after the application, has minimal tissue reactivity, lubricity and its main advantage is resistance to the bacterial contamination and it can be used as a stenting material for endonasal DCR. Prolene is blue coloured, for high visibility. So, it can be easily procured intranasally lateral displacement of the stent which causes eye discomfort, conjunctivitis, erosion of the cornea can be prevented by tying multiple knots in

nasal cavity. Prolene is low cost, effective, and easily available in almost all operating theatres. It could be used successfully in endoscopic DCR and used as an alternative to silicone stent, especially in settings with minimal resources and is effective in primary cases with postsaccal or nasolacrimal duct obstruction. En DCR has a higher rate of success with or without stent placement.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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