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Paediatric Endoscopic Endonasal Dacryocystorhinostomy Our Experience of 24 Cases

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Abstract:
Introduction :*The therapeutic approach in children with Nasolacrimal duct obstruction (NLDO)differs from that used in adults. While Dacryocystorhinostomy(DCR) is the most common procedure in adults. It is carried out less frequently in children. It is indicated for children with persistent NLDO refractory to probing and in cases of recurrent or chronic dacryocystitis.*
Aims and objectives *: The objective of the study is to report a series of 24 cases of paediatricepiphora who underwent Endoscopic EndonasalDacryocystorhinostomy surgery (E.E.DCR), for primary obstruction of Nasolacrimal Duct (NLD) and results evaluated.*
Materials and methods*: This is a retrospective and non comparative review of 24 cases of epiphora aged between 6yrs-15yrs from January 2007 to December 2014.*
The main outcome measures assessed were patients demographics ,previous treatment ,clinical presentation ,investigation, operative and post operative complications and results.
Results*:*
In our study 24 patients underwent unilateral Dacrocystorhinostomy[DCR] surgery in Nasolacrimal duct obstruction [NLDO] . In 24 patients males were 16 and females were 8 The results are evaluated after surgical procedure with regards to success rate and conclusions are drawn .
Key Words*: Endonasal DCR, Pediatric age .*

Abbreviation:
NLDO- Nasolacrimal duct obstruction
DCS-Dacrocystitis
DCR-Dacrocystorhinostomy
EEDCR-Endoscopic endonasalDacrocystorhinostomy
DNE-Diagnostic nasal endoscopy
DCG-Dacrocystogram
CT-Computerised Tomography

I. Introduction

Epiphora in children is a very common condition affecting 20% of infants during the first year of life because of persistent Membranous web at Hasner'sValve.It is known as congenital NLDO and about 90% of these obstructions resolve spontaneously with simple conservative methods.[1] In persistent obstructions probing is performed to relieve the obstruction ,which often results in successful resolution of epiphora. [2] Consequently Pediatric DCR is not often the first line of treatment for children with Symptomatic chronic NLDO. The DCR surgery is indicated when there is no response or relief of epiphora to previous therapy like probing ,syringingor if it is associated with recurrent DCS. DCR surgery in children is quite challenging because of poorly developed and shallow lacrimal crest ,rapidly growing facial bones may lead to improperly created nasolacrimal window . Excessive Scar tissue formation in growing tissue adds to further concern .Children with Craniofacial anamolies and genetic syndromes have poor results after DCR surgery .

II. Materials And Methods

Aim: The aim of present study is to assess the outcomes of Authors cases of DCS[24 cases] and compare it with others and to assess the predictors of success of surgery and causes of failure. Study methods:This is a retrospective study, performed in Government ENT hospital /Osmania Medical college which is a tertiary care referral centre . Institutional Ethical Committee clearance has been taken to perform this study. Cases referred from Sarojinidevi Eye Hospital &Govt ENT Hospital Koti,Hderabad,Telangana state, India. Diagnostic Nasal Endoscopy(DNE) was performed with 2.7mm nasal Telescope and 4mm nasal telescope was used for DCR surgery.

In all cases preoperative workup was done by Digital Xray PNS, CT PNS, Surgical profile .Dacryocystogram was not done in any case.

Inclusion Criterion:
1.All the children below 16 year with chronic DCS.
2. Epiphora due to post saccal block diagnosed by clinical examination like regurgitation test and syringing.
3. Recurrent DCS with Endonasal or External approach.
4. Children with epiphora associated with Deviated nasal septum and hypertrophied inferior turbinate are also included.

Exclusion Criterion:
1. Epiphora with nasal pathologies like atrophic rhinitius, polyposis, granulomatous diseases of nose and sinuses.
2.Patients with DCS above the age of 16 years.
3. Patients having canalicular block are excluded in the study.
4.Children with gross craniofacial anomalies and genetic syndromes are excluded.

Operative Procedure:

All the children are laid in supine position with 30 degree head end elevation under General Anaesthesia .After decongesting the nose with 4% xylocaine and adrenaline 1 in 30000 solution, Infiltration was done with 1% Xylocaine with 1 in 1 lakh adrenaline. A curvilinear incison was made 6 mm above the axilla of the middle turbinate placed 1cm anterior to the base of uncinate process. Nasal flap is elevated posteriorly.The lacrimal sac is completely exposed upto the fundus with the help of kerrison punches of 1-3 mm size and the powered instrumentation using 4mm DCR burr .Sac is incised in the middle like a open book , The nasal flap is trimmed with microdebrider to the size and placed over the posterior lacrimal flap .The anterior wall of the open sac is placed over the frontal process of maxilla [Posterior flap technique]. Mitomycin-c was applied at the opening of the lacrimal stoma. Stent was inserted in 4 revision cases only. No nasal tamponade was applied for the fear of displacement of flaps.The gel foam was applied at the opening of the nasolacrimal window .
Patients were followed up weekly during the first month, twice a month for three months, once in six months for one year. Stents inserted in all the 4 patients were removed at the end of three months.

III. Results

A total number of cases included in the study were 24 Of which 20 cases were operated for the first time and 4 were revision cases referred from Sarojini Devi Eye hospital.Male : Female ratio is 2:1. (16:8).The demographic data is represented in table 1

Table 1- Demographic Data

Age(in years)	Number	male	Female	right	Left	bilateral
6-7	2	1	1	1	1	0
7-8	1	1	0	1	0	0
8-9	5	3	2	2	3	0
9-10	0	0	0	0	0	0
1o-11	2	2	0	1	1	0
11-12	5	2	3	4	1	0
12-13	6	5	1	2	4	0
13-14	2	1	1	1	1	0
14-15	1	1	0	1	0	0

75% [18/24]of our cases had relief of their symptoms . In 25%[6/24] of the patients there were no relief of symptoms due to adhesions and other factors . No major complications were reported in the series . A few minor complications are reported in Table 2

Table 2: Complications

Nasal Bleeding	2
Ecchymosis/ lid edema	5
Orbital cellulitis	0
Adhesions	4 between IT and Septum 2 between MT and septum
Partial improvement	2
Anosmia	0

IV. Discussion

It is evident that endonasal approach is preferred in the recent papers with regard tppaediatric DCR and it is highly successful alternative to external DCR[3] ,[4]. The advantage of endoscopic DCR in a child avoids skin incision ,doesn't disrupt medial canthus and a better control of nasal bleeding . The present study has achieved all the objectives[3] ,[4]

The therapeutic approach in children with NLDO differs from that used in adults. While DCR is the most common procedure in adults,it is carried out less frequently in children. It is indicated for children with persistent nasolacrimalduct obstruction refractory to probing and in cases of recurrent or chronic dacryocystitis .[4]

In the present series majority of children had probing twice before referral to surgery. Four patients had previous surgery(2 children underwent external DCR and another 2 had endoscopic DCR).Because the commonest site of obstruction is at or above the level of valve of Hasner,which is the commonest indication for DCR surgery. The success rate of endo DCR is high in children.[5],[6].The reports on endoscopic endonasal DCR in children carry a good success rate provided you execute good meticulous surgical technique and the success rates for endoscopic DCR in congenital in congenital NLDO in children have been evaluated to be between 88-100%[6],[7],[8],[4].Eloy et al achieved a complete resolution of symptoms in 9 out of 10 primary DCR surgeries in children.[2] It is evident that endonasal approach is preferred in the recent papers with regard to paediatric DCR and it is highly successful alternative to external DCR[6] ,[4]Silicon tubing is controversial issue in the literature [6],[8],[4],[9]. We used stent only in 4 revision casesThe use of Mitomycin C has yielded better results in our series. No major complications were reported in the present series, but minor complications mainly adhesions were reported in25% of cases. The incidence of adhesions in our series is probably due to improper follow up,incomplete crust removal.Paediatric DCR's may have unfavourable outcome because of flat poorly developed lacrimal crest and rapidly growing facial bony centres which may lead to improper creation and closure of nasolacrimal window . Excessive scar tissue formation is another problem encountered in paediatric DCR.Nowinski Et al reported closure of rhinostoma in all 5 out of 5 repeat DCR surgeries .[5]Good results in our study could be attributed to exclusion of craniofacial anamolies and exclusion of canalicular problems. The execution of meticuloussurgical technique coupled with use of Mitomycin C yielded good results.

V. Conclusion

The Endonasal Endoscopic DCR is a safe and effective surgical procedure for children with NLDO who are resistant to probing , irrigation and intubation. The success of surgery mainly depends upon level of obstruction of lacrimal system. With post saccal cases the results are excellent on long term basis. Powered instruments and mitomycin-C application are extremely useful in achieving better results. Overall success rate is about 75% .

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