DACRYO CYSTO RHINOSTOMY
A MODIFIED SIMPLE PROCEDURE

THESIS FOR
M. Ch (Ophthal) Certification Programme

UNIVERSITY OF SEYCHELLES
AMERICAN INSTITUTE OF MEDICINE

By

Dr. P. P. Kunhiraman
M. B., B.S, M. S(Ophthal), D.O.M.S
“DARSANA”, TALAP
KANNUR- 670 002, KERALA
INDIA

E-mail : ppkraman@yahoo.com
Cell : 9895655232
ENQ No : 1180

Sept : 2009
INTRODUCTION, ABSTRACT & CONCLUSION

External dacryocystorhinostomy remained the gold standard in the outcome of surgical management for primary acquired nasolacrimal duct obstruction (PANDO) for more than hundred years. Ever since this was documented by Tote in 1904 this unique surgical method remained almost unchanged.

External DCR is being practiced world over for treating chronic dacryocystitis and accompanying chronic epiphora.

Ten eyes of nine patients were included in this study, and they were selected from the out patients of the Eye department, A. K. G. Memorial Co-operative Hospital, Kannur- a multispecialty 400 bedded Medical institution of North -Kerala. The Study was conducted during the period from July 08 to Sept 09.

The aim of this study is to demonstrate a more simplified modification of External DCR. In conventional DCR, a bony Ostium is made through lacrimal bone and lacrimal sac is anastomosed with the nasal mucosa of the middle meatus. But in this modified procedure no nasal mucosal flap was raised, instead a large bony ostium was made as in standard DCR, the anterior flap of the lacrimal sac was pulled across bridging the bony ostium and sutured to the periosteum of the lacrimal bone.

During the followup period ranging from fourteen months to 6 weeks all ten eyes of nine patients were observed and found that the eyes were free of epiphora and all had free flow of fluid into the nasal cavity on syringing.

This modified DCR is simple to perform and in this series succes rate was 100%.
Scope of the problem:

There are various surgical techniques now available to treat chronic nasolacrimal duct obstruction apart from conventional DCR such as endoscopic transnasal DCR, Laser assisted conalicular DCR etc.

Harvesting nasal mucosal flap in Conventional DCR is cumbersome and often nasal mucosa bleeds profusely and the surgical procedure is likely to consume more time than expected. This modified procedure is simple, with less bleeding and takes less time. This could be undertaken as an out patient procedure. Average time taken for surgery was only 60 minutes. There was no recurrence of Symptoms and failure rate was nil. Hence this procedure is a better option for younger ophthalmologists and beginners.

Materials & Methods:

For this prospective study ten eyes of nine patients were included. All were operated in the eye dept of AKG memorial Co-op Hospital, as inpatients (at patients choice). Most of these patients were not aware of the gravity of the disease and hence they all needed pre operative briefing about the disease and surgical procedure. Written consent was obtained.

All patients in this study group underwent pre operative evaluation including detailed clinical history of watering, discharge, mass/swelling, fistula, acute attacks of redness, presence of scar, duration of symptoms, use of eye drops, blood dyscrasias, facial trauma, sinus surgery, allergic rhinitis, bleeding from nose or puncta, previous lacrimal surgery, ocular examination for mass/swelling, pressure regurgitation test, slit lamp biomicroscopy to rule out reflex tearing, surface or eyelid diseases such as trichiasis, blepharitis entropion and lag opthalmos. ENT cheekup was done to rule out any nasal pathology.
Routine investigations included hemoglobin, routine urine microscopy - albumin and sugar, bleeding and clotting time. Dye disappearance Test and evaluation of tear meniscus and syringing were done preoperatively.

**The Technique:**

Modified DCR was performed in ten eyes of nine patients between the ages of 46 & 75 years. All operations were done under local anaesthesia (Infra trochlear and infra orbital infiltrations) with 2% xylocaine and bupivacaine 0.5% in equal proportion. Ipsilateral nasal packing was done.

10 to 12 mm long incision 3 mm medial to medial canthus was made with No : 11 BP Knife. Sub cutaneous tissue and orbicularis muscle were deepened. Medial Canthal tendon was incised at its middle. Bleeding points were cauterised. Periostium overlying, frontal process of maxilla was exposed. Periostium of anterior lacrimal crest was incised. Lacrimal sac was exposed and dissected away from lacrimal fossa. Lacrimal bone was broken after removal of nose pack using plain forceps. Bony ostium 15 mmx 15 mm size was made using 2 mm Kerrison bone puch. Nasal Mucosal flap was not fashioned. Lacrimal sac was incised vertically, along the posteromedical aspect below upwards vertically, using 2.8mm bent pointed Keratone (used for Sics) Keeping the medial wall of the lacrimal sac under stretch having introduced a lacrimal probe tip into the sac through the lower punctum and canaliculus, into a large anterior flap and a smaller posterior flap. Posterior flap of the Sac was excised. At this stage the probe was with drawn and a fine silicon tube 2 mm diameter was passed through the punctum into the lower canaliculus, under the antr flap of lacrimal sac into the nasal cavity through the bony ostium to make sure that the sac wall was properly opened. This also helped
to wash out blood and debris through syringing during the immediate post operative period. The large anterior flap of sac was freely mobilized and sutured to the periosteum of the lacrimal crest with three interrupted sutures using 6/0 polyglactin, in such away the anterior flap of the sac bridges over the bony ostium. The cut ends of the Medial palpebral ligament was sutured together and wound was closed in layers.

Post operative treatement included systemic antibiotics, vit.C & B complex, topical ciprofloxacin eye drops Qid, nasivion nose drops bid for seven days. First post operative syringing was done on next day. Syringing was repeated on 3\textsuperscript{rd}, 7\textsuperscript{th}, 15\textsuperscript{th} day & at the end of one month. Subsequent syringing was done towards the close of 3\textsuperscript{rd}, 6\textsuperscript{th} and 9\textsuperscript{th} months.

Post operative success criteria included patent syringing, drainage of fluorescein dye during dye dilution test and relief of epiphora.

**OBSERVATION AND OUTCOME :**

After modified DCR tears from the common canaliculus drain directly into the tissue spaces of nasal cavity through the bony ostium under the anterior flap of the lacrimal sac.

The Success rate of this surgical procedure was very encouraging. Patient selection was strictly done on the basis of defined criteria.

**Indusion Criteria :**

Only patients with nasolacrimal duct obstruction were included in this study. Failed surgical cases were excluded.
Exclusion criteria :

- Ocular surface Disorders
- Intra nasal pathology (Gross DNS, Hypertrophied middle turbinate)
- Debilitated and mentally disabled patients
- Severly diabetic patients
- uncontrolled Hypertension

Analysis & Discussion :

Ten eyes of nine patients were operated during the period from July 08 to Aug 09. Except these 3 cases done during aug 09, all other six patients had a follow up of more than six months. Out of nine patients males were 3 (30%) and females 6 (70%). Male : female ratio 30 : 70%. Rt eye was affected in 80% and left eye 20%. Bilateral involvement was 11% unilateral 89% Avrage age was 60.3 yrs. Age group was ranging from 46 yrs to 75%. Females were more affected. Unilateral involvement was more common and right eye was more affected than the follow eye.
Statistical Analysis:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Operated eye</th>
<th>Date of Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56</td>
<td>Male</td>
<td>NLD obstrn</td>
<td>R</td>
<td>11-07-08</td>
</tr>
<tr>
<td>2.</td>
<td>75</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>L</td>
<td>25-08-08</td>
</tr>
<tr>
<td>3.</td>
<td>54</td>
<td>Male</td>
<td>NLD obstrn</td>
<td>R</td>
<td>11-12-08</td>
</tr>
<tr>
<td>4.</td>
<td>46</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>R</td>
<td>18-12-08</td>
</tr>
<tr>
<td>5.</td>
<td>55</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>R</td>
<td>25-12-08</td>
</tr>
<tr>
<td>6.</td>
<td>70</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>L</td>
<td>01-01-09</td>
</tr>
<tr>
<td>7.</td>
<td>70</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>R</td>
<td>12-12-09</td>
</tr>
<tr>
<td>8.</td>
<td>60</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>R</td>
<td>17-08-09</td>
</tr>
<tr>
<td>9.</td>
<td>57</td>
<td>Female</td>
<td>NLD obstrn</td>
<td>R</td>
<td>17-08-09</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>Female</td>
<td>NLD obstrn</td>
<td>L</td>
<td>19-08-09</td>
</tr>
</tbody>
</table>

All cases were done under local anaesthesia. Infra trochlear nerve block to anaesthetise the medial end of the upper lid, side of the nose, medial conjunctiva, caruncle and lacrimal sac, and infra orbital nerve block to anaesthetise the skin and conjunctiva of the lower lid, lower part of the side of nose and upper part of the upper lip.
During the course of the surgery all patients were very quiet and cooperative and none of them raised any complaints of pain or discomfort.

It is the function of the lacrimal gland to secrete tears. It is slightly alkaline in nature and consists mainly water and minute quantities of salt particularly Nacl, sugar, urea and Protein, in addition to lysozyme an enzyme with antibacterial properties.

**Drainage of Tears :**

Both Capillary action and muscular contraction during blinking help to propagate the tears along the canaliculus, sac and naso lacrimal duct, to the nose from where it is evaporated.

Epiphora denotes watering from the eyes due to obstruction to outflow of tears. Dacryocystitis is a condition of inflammation of lacrimal sac. This study is taken up to evaluate the efficiency of a modified surgical modality to
overcome nasolacrimal duct obstruction in primary chronic dacryocystitis in adults.

The bone at the bottom of the lacrimal fossa is thin, may be easily perforated by using Traquair’s elevator and the surrounding bone may be removed piece meal until a hole of sufficient size was created to admit the punch forceps. The surrounding bone was nibbled away. It is essential to remove an adequate amount of bone till the ostium is about 15x15mm size. This entails removal of the entire lacrimal bone, a portion of lamina papyracea of ethmoid. Sometimes the ethmoid cells may be opened. This need not cause any worry, because any portion of ethmoid labyrinth which obstructs any access may be removed.

It is important to ensure that the probe has free access to the interior of the sac through the lower canaliculus and the cavity of the sac is properly entered in. Sometimes diverticulae of the sac may be found which need to be excised.

**Ethonoidal Sinus :**

![Diagram of Paranasal Sinuses](image)
These are multiple air containing cells situated in ethmoid Labyrinth. These are arranged in three main groups. Inferior and middle group of cells drain into middle meatus of the nose and the posterior group to superior meatus.

Ethmoid air cells are related laterally to orbit and are separate from it by a thin bone (lamina papayracea). Posterioly ethomoids are related to optic foramen. Superiorly this may reach to a level above the cribriform plate.

Lacrimal sac is about 10 mm long and lies in the lacrimal fossa between anterior and posterior lacrimal crests. The lacrimal bone and the frontal process of maxilla separate the lacrimal sac from the middle meatus of the nasal cavity.

In modified DCR technique anastomosis is created between
the sac and nasal cavity to bypass the obstruction in nasolacrimal duct.

Secretion rate of tears is estimated to be 2.4 micro liters/min. The volume of tear film is 6.4 micro liters/min and PH is 7.4 (7.3 to 7.7)

**Advantages of Modified DCR:**

1. 10 to 12- mm long skin incision is enough for this procedure
2. No obvious post operative scar seen towards the end of 3rd month
3. Chances of closure of drainage channel is rare because the large anterior flap of the sac wall is roofing the wide bony ostium.
4. Intra operative and post operative bleeding is negligible.
5. Easy to perform as an outpatient procedure
6. Early ambulation
7. Repeat surgery was not required in any of the cases in this series.

**Causes of Failure:**

1. Inadequate size and position of the ostium
2. Unrecognized common canalicular block

**Possible complications:**

1. Cutaneous Scar in patients with keloid tendency
2. Sunken scar if not the incision is closed in layers
3. Injury to medial canthal structures
4. Haemorrhage
5. Cellulitis
6. CSF Rhinorrhea
7. Tearing or laceration of anterior sac flap
8. Improper / Inadequate entry into the nasal cavity

Conclusion and recommendation:

The tear fluid is almost like any intercellular fluid. The quantity secreted per minute is very small and rate of secretion also is low. So this much of tear fluid could reach the nasal cavity through the large bony ostium created in this modified procedure even without an anastamosis between nasal mucosa and lacrimal sacwall. The Ostium being sufficiently large and the posterior flap of the sac wall already well excised, the tear fluid from the canaliculi flows underneath the antirior flap of lacrimal sac through the bony ostium into the tissue spaces of the nasal cavity without any obstruction. During the follow up period of this study ranging from 14 months to 6 weeks, none reported with recurrence of symptoms, or complications such as
striction of canaliculus and secondary obstruction of nasolacrimal passage. The drainage status was assessed after nasolacrimal syringing during the follow up visits with fluorescein dye.

This simple modified DCR procedure is easy to perform. The results are excellent and encouraging.
Reference :

1. KANSKI JJ, clinical opthalmology , 5th end


6. Crawford Js. Initubation of the lacrimal system ophthal,, Plast, Reconstruction Surg-1990-21,90

7. Eugene Wolff’s Anatomy of the Eye and orbit

8. Keith Lyle, Cross & Cook, May and Worth’s Disease of the eye. 13th edn


11. 11. Lacrimal system by Jeffrey Jay Hurwtz Lippin cott Williams & Wilkins -1995


DECLARATION

I Dr. P.P. Kunhiraman do hereby declare that this thesis titled “DACRYOCYSTO RHINOSTOMY- A MODIFIED SIMPLE PROCEDURE” is my original work and that no copyrights have been infringed upon and this work has been done in the Eye Department of AKG MEMORIAL -CO.OPERATIVE HOSPITAL, Kannur –2, Kerala, India, and Dr. (Mrs) P. R. INDIRADEVI. MBBS, DLO, DO(Eye and ENT Surgen), AKG MEMORIAL –CO.OPERATIVE HOSPITAL, Kannur –2, Kerala, India, had also participated in this study.

Dr. P. P. KUNHIRAMAN.
ELCLOSURE

- VIDEO OF THE SURGICAL PROCEDURE
- PHOTOS OF THE SURGICAL PROCEDURE
- SIGNED HARD COPY OF THE THESIS IN FULL
- SIPED FORMAT OF THE THESIS
- ALL THE ENCLOSURE ALONG WITH THE THESIS PROPER FORWARDED TO registrar@mch-ophthal.com