External Dacryocystorhinostomy (Ext-DCR); a prospective study

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Abstract:

**Objective:** To present the outcome of the external Dacryocystorhinostomy (Ext-DCR) by excision of posterior mucosal flaps as a primary procedure for chronic dacryocystitis. Materials and Methods: The present prospective study was conducted from January 2015 until June 2015 at Misurata Central Hospital. Detailed history of local nasal condition like chronic allergy and treatment or direct nasal trauma, in addition to full rhinological workup by E.N.T specialist was done for all cases to exclude the grossly deviated nasal septum, nasal polyps, hypertrophied turbinate and sinusitis. Blood diseases, History of anticoagulant intake was taken, also local eye examination of conditions like dry eye, rubbing lashes, mal-positioned eyelids, complete slitlamp examination, paralytic ectropion resulted from facial palsy were excluded from the study, finger lacrimal sac regurgitation test and irrigation of lacrimal system were done. Thirty patients have been admitted and prepared for full medical and anesthetist evaluation, investigated for blood and viral serology, informed consent pre-operatively. The success rate and complications were recorded over a follow-up period of 06 months. Results: The mean age of our study group was 40 years. There was a female predominant 21 (70%) with a Male: Female ratio of 1:2.3. Intraoperative complications were bleeding (accidental periostium and nasal mucosal trauma) in 16% cases, post-operative complications were recurrent epiphora and discharge in 13%, Silicon tube extrusion in 7%. Four patients had failed Ext-DCR after 06 months. In three cases, the obstruction of the bony ostium by granulation tissue 10% and in one case the sump syndrome 3% were the cause of failure of Ext-DCR. Conclusion: Ext-DCR surgery carries high success rate 87% when it is done as a primary procedure for treating chronic dacryocystitis.

**Key words:** Chronic dacryocystitis, Regurgitation test, excision of posterior mucosal flaps, Ext-DCR.
**Introduction:**

Dacryocystitis inflammation and infection of the lacrimal sac is usually secondary to obstruction of the nasolacrimal duct. It may be acute or chronic\(^1\). Chronic dacryocystitis is a chronic inflammation of the lacrimal sac due to blockage of the nasolacrimal duct leading to constant and annoying epiphora. Chronic dacryocystitis (CDC) is always secondary to the obstruction in the nasolacrimal duct (NLD) and in a majority of cases the cause is obscure. However it is seen more commonly in females (80%) and patients with nasal anomalies like deviated nasal septum, nasal polyp etc. Some patients show a familial tendency so a genetic basis cannot be ruled out, most cases however remain of unknown etiology\(^2\). It is usually caused by partial or complete within nasolacrimal duct. The causes of acquired obstruction are idiopathic, secondary like infection, inflammation, trauma and neoplasms. Patient with chronic dacryocystitis may remain asymptomatic or have watering, discharge from the eye and swelling at lacrimal region (mucocele)\(^3\). The external DCR is a highly successful procedure in managing an epiphora due to NLD obstruction. Recently endonasal DCR and endolaser DCR has been gaining in popularity over the traditional DCR owing to the advantages of no scar, less tissue damage, and less intraoperative time\(^4\). Finger pressure over the lacrimal sac can cause mucopurulent material to regurgitate through the punctum confirming a diagnosis of chronic dacryocystitis, if pressure regurgitation over the lacrimal sac (ROPLAS) is positive\(^5\).

**Objective:** To present the outcome of the Ext-DCR as a primary procedure for chronic dacryocystitis.

**Materials and Methods:** The present prospective study was conducted from January 2015 until June 2015 at Misurata Central Hospital. The study included 30 patients with nasolacrimal duct obstruction {Objective: To present the outcome of the external Dacryocystorhinostomy (Ext-DCR) by with an excision of posterior mucosal flaps as a primary procedure for chronic dacryocystitis}. who underwent the external DCR as a primary procedure under general anesthesia. The success rate and complications were recorded over a follow-up period of 06 months. Detailed history of local nasal condition like chronic allergy and treatment or direct nasal trauma, blood diseases, anticoagulant drug intake were taken, also local eye examination of conditions like dry eye, rubbing lashes, mal-positioned eyelids, complete slit lamp examination, paralytic ectropion resulted from facial palsy were excluded from the study, finger lacrimal sac regurgitation test and lacrimal system irrigation were done. A thorough rhinological checkup by E.N.T specialist was done in all cases to exclude the grossly deviated nasal septum, nasal polyps, hypertrophied turbinate and sinusitis. And those admitted patient they have prepared full medical and
anesthetist evaluation, investigated for blood and viral serology, informed consent preoperatively. The follow up period is 06 months duration. Surgical Technique Ext-DCR is a bypass procedure that creates an anastomosis between the lacrimal sac and the nasal mucosa of the middle nasal meatus via a bony ostium. A standard Ext-DCR procedure under hypotensive general anesthesia with head-up tilt was performed in all cases. The nasal cavity of the operative side was packed with ribbon gauze with 2% lidocaine and 1:000 adrenaline. A straight vertical incision with a number 15 blade avoiding the angular vein 10 mm from inner canthus 2 cm in length, four 4/0 skin traction sutures placed for better wound view, medial canthal ligament identified an divided and blunt dissection was performed until the periosteum of the frontal process of the maxilla was identified, a periosteal elevator was used to elevate the periosteum over the anterior lacrimal crest and into the lacrimal sac fossa, the lacrimal sac is laterally reflected and exposing the lacrimal bone. The lacrimal bone was infractured through lacrimo-maxillary suture. A Kerrison rongeur was used to create an osteotomy of approximately 2× 2 cm in diameter, both puncta were dilated with lacrimal dilator then lacrimal probe is passed to tent the lacrimal sac and a number 11 blade was used to incise the lacrimal sac creating anterior and posterior flaps. The nasal packing is removed then the nasal mucosa was incised to anterior and posterior flaps, Insertion of Crawford-style, bicanalicular, silicone stents was performed, the silicone stents were exteriorized through the nostril under guide of Artery forceps and tied together. The anterior nasal and lacrimal sac mucosal flaps were sutured with 6/0 Vicryl sutures along with excision of posterior nasal and lacrimal sac mucosae. The medial canthal ligament was repaired with 6/0 Vicryl sutures and skin incision closed by 6/0 Silk. Postoperative Ciprofloxacin tablet 500 mg twice a day plus voltaren tablet 25 mg twice along with nasal drop decongestant drop for 5 days were prescribed for all patient. Patients were seen at 1 st postoperative day, one week later skin sutures were removed, 1 month, and 2 months after surgery and subsequently according to clinical course. Silicone stents were removed at 06 months follow-up appointment. Surgical success was defined by resolution of infection and a lack of symptoms, such as epiphora. Surgical failure was defined as persistence or recurrence of dacryocystitis or epiphora.

**Results:** A total of 30 patients with nasolacrimal duct obstruction who underwent the ext-DCR as a primary procedure, the success rate and complications were recorded over a follow-up period of 06 months. The mean age of our study group was 40 years. Majority of affected patient were female 21 (70%), with a Male: Female ratio of 1:2.3 (Table 1). Intraoperative complications were bleeding (accidental periostium and nasal mucosal trauma) in 16% cases, post-operative complications were recurrent epiphora and

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mucopurulent discharge 13%, Silicon tube extrusion 7%. Four patients had failed ext-DCR after 06 months. In three cases, the obstruction of the bony ostium by granulation tissue and in one case, the sump syndrome was the cause of failure of ext-DCR, the success rate was found to be 87% (Table 3).

### Table (1): Demographic profile of the study group with chronic dacryocystitis

<table>
<thead>
<tr>
<th>Age groups in years</th>
<th>Male</th>
<th>Female</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-40</td>
<td>5</td>
<td>6</td>
<td>11 (37%)</td>
</tr>
<tr>
<td>40-50</td>
<td>3</td>
<td>12</td>
<td>15 (50%)</td>
</tr>
<tr>
<td>&gt; 50</td>
<td>1</td>
<td>3</td>
<td>4 (13%)</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
<td>21</td>
<td>30 (100%)</td>
</tr>
</tbody>
</table>

Majority of affected patients were female 21 (70%)
Mean age group 40 years
Male: Female ratio 1:2.3

### Table (2): Operative complications

<table>
<thead>
<tr>
<th>Intraoperative complications</th>
<th>Number of Patient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding (accidental periostium and nasal mucosal trauma)</td>
<td>5</td>
<td>16%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postoperative complications</th>
<th>Number of patient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent epiphora and mucopurulant discharge</td>
<td>4</td>
<td>13%</td>
</tr>
<tr>
<td>Silicon tube extrusion</td>
<td>2</td>
<td>7%</td>
</tr>
</tbody>
</table>

### Table (3): Cause of failure of DCR

<table>
<thead>
<tr>
<th>Cause of failure</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ostium closure due to granulation tissue</td>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>Sump syndrome</td>
<td>1</td>
<td>3%</td>
</tr>
</tbody>
</table>

Four patients had failed ext-DCR after 6 months
Postoperative success rate is 87%

Discussion The conventional external route is the gold standard in managing an epiphora due to NLD obstruction (NLDO) with a success rate of 90-95% (5). The age and gender distribution of our patients generally complies with figure in literatures Elwan S, Deka A et al, Dubey A et al (6) (7) (8). The female predominance can be explained by a narrow lower nasolacrimal duct and the secondary hormonal changes in the middle aged females, Zaman et al (9).
Majority of affected patients were female and the mean age group is 40 years which is almost equal to Sheikh Sajjad et al result in term of gender, mean age group and male to female ratio. The overall success rate of ext-DCR is 87% in Daniel R et al (10). In my study the success rate of ext-DCR 87% which is similar to Daniel R et al study. Anastomosis by suturing only anterior flaps and excision of the posterior flaps is easier to perform and simplifies the surgical procedure. On the other hand, suturing the posterior flaps often constitutes a difficulty and may take a considerable amount of time, particularly in the presence of bleeding during the surgery. A study by Elwan S reported a success rate of 90% with excision of posterior flaps and 85% with suturing, he concluded that excision of the posterior flaps may improve the success rate. Intraoperative complications encountered were bleeding in 5 patients (16%). The source of bleeding was nasal mucosa. The bleeding was controlled by nasal packing and the surgery was successfully completed. Post-operatively mucopurulent discharge (failed DCR) occurred in 4 patients (13%) during irrigation test and tube extrusion in two patients. The causes of failure were granulation tissue blocking the rhinostomy site in 3 cases and one patient developed sump syndrome in which the surgical opening in the lacrimal bone is too small and too high, lacrimal sac dilate and secretions collect, both causes were proved during E.N.T specialist examination. These complications rate are similar to Kaçaniku G et al study (11).

**Conclusion:**
The future of lacrimal surgery is changing with the introduction of endoscopes and lasers, but the ext-DCR still remains the gold standard for lacrimal surgery. This study concludes that suturing of anterior flaps with excision of posterior flaps along with the silicone tube intubation is a successful procedure. External DCR surgery carries high success rate 87% when it is done as a primary procedure for treating chronic dacryocystitis.
References

4- Sheikh Sajjad1, Wasim Rashid and et al. A Simplified Approach to Dacryocystorhinostomy: A Prospective Study. DOI: 10.17354/ijss/2015/391