Original Article

External Dacryocystorhinostomy under Local Anesthesia

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Purpose: To document the results of External dacryocystorhinostomy (EX-DCR) under Local Anesthesia with sedation for treatment of nasolacrimal duct (NLD) obstruction.

Study Design: Interventional study case series.

P**lace and duration of Study:** conducted at a private clinic in Gilgit Pakistan over a 3 year period.

Materials and Methods: Data was prospectively collected on all patients who underwent EX-DCR. The Indication for surgery was a blocked nasolacrimal duct obstruction. Patients underwent irrigation of the nasolacrimal drainage systems, fluorescein dye disappearance test, and intranasal examination. Patients with previous dacryocystorhinostomy surgery to the same eye were excluded from the study. EX-DCR was performed under local anesthesia with sedation on outpatient basis by a single surgeon having expertise in the technique. Follow up was at day 1, 1st week and on 6th month for. During postoperative visits, patients were asked about symptomatic resolution of epiphora and assessed with patency on irrigation, fluorescein dye disappearance test, and intranasal examination. All patients were followed up for at least 6 months. Surgical success was defined by patient's resolution of symptoms with patency on irrigation.

Results: 61 patients were included in the study with a mean age of 37.16 ± 12 years. Most of the operated patients were females (77.05%) with a nearly equal distribution between left and right eyes. Intraoperative complications were unable to suture posterior flap (4.92%), excessive bleeding above 100ml in one patient, snipping of puntum one patient and unable to pass DCR tube in one patient. None of the patients had uncontrolled intranasal bleeding, cardiovascular event or local anesthesia toxicity during the surgery. All of the patients had a successful outcome which was determined by patent syringing. The most common Post-operative complication was ecchymosis in 14.75%.

Conclusion: In order to avoid the risks of General anesthesia, EX-DCR under LA with sedation is a safe and highly effective alternative technique in terms of surgical outcome.

Key Words: Dacryocystorhinostomy, local anesthesia, nasolacrimal duct obstruction.

Epiphora is a common ophthalmic problem which may be either due to congenital or acquired nasolacrimal duct obstruction. For many decades the gold Standard treatment for nasolacrimal duct obstruction has been external dacryocystorhinostomy (Ex-DCR) surgery .It was first described by Addeo Toti in 1904[1] and gained popularity due to its efficacy and relatively low complication rates. The endonasal approach for lacrimal surgery was first introduced in 1893 by

Caldwell.[2] However it is in recent time endoscopic endonasal DCR has been employed for the treatment of nasolacrimal duct obstruction. The internal approach of Endoscopic / endonasal dacryocysto-rhinostomy (Endo-DCR) gained popularity because of having advantages of decreased morbidity, decreased post operative and reduced recovery time.[3] However its disadvantages having steep learning curve, difficulty in manipulations in the narrow nasal cavity, use of general anesthesia and the expense of equipment for endoscopic techniques make it impractical in under developed areas.[4]

The majority of EX-DCRs are being done under general anesthesia (GA) but published works have shown success using local anesthesia (LA) in elderly patients[5] and youth[6]. LA requires less ancillary and specialized staff and a shorter hospital stay. In this study, we aimed to document the results of EX-DCR performed under local anesthesia with sedation.

MATERIAL AND METHODS

The principles outlined in the Declaration of Helsinki (2008) were followed for the conduction the study[7]. Data was prospectively collected on all patients who underwent EX-DCR at a private clinic in Gilgit Pakistan over a 3 year period (Aug 2009 until Aug 2012). All of the patients above the age of 15 years in whom surgery was indicated were selected. The Indication for surgery was a blocked nasolacrimal duct obstruction (NLD). Patients underwent ophthalmic examinations including irrigation of the nasolacrimal drainage systems, fluorescein dye disappearance test, and intranasal examination. Documented obstruction on syringing and probing were included whereas patients with previous DCR surgery to the same eye were excluded from the study. The patients signed informed consent for the procedure opting not be operated under general anesthesia but if deemed necessary were to be given general anesthesia. All surgical procedures were performed on an outpatient basis by a single surgeon having expertise in the technique.

One hour before starting surgery, intragluteal 30mg pentazocine in 1ml (narcotic analgesic) mixed with 50 mg dimenhydrinate in 1 ml (antiemetic) and 75 mg diclofenac sodium intramuscularly separately in order to prevent crystallization (usually in the arm or contra lateral gluteous) were administered. An intravenous injection of 250 mg tranexamic acid (an anti-fibrinolytic) in 5 ml was given preoperatively. For local anesthesia, 10 ml of a 50/50 mixture of 2% lidocaine with adrenaline 1/200,000 and bupivicaine HCl 50 mg/10 ml was made. First, it was injected 5ml near the supraorbital foramen, directing the needle towards the medial canthus and the area was infiltrated resulting in raised skin. Next, 5ml was injected near the infraorbital foramen and again infiltrated this area up to the medial canthus. Proparacaine HCl 0.5% ophthalmic drops were placed in the conjunctival sac and benzocaine 20% was sprayed to anesthetize nasal mucosa. Before surgery, the nasal mucosa was packed with 2% lidocaine and 1/200,000 epinephrine left over from the 10 ml vial. After swabbing the nose and orbital area skin with povidone iodine 10%, a sterile field was created expositing the medial canthal tendon. A vertically inferior, temporally angled skin incision 5-8mm long was made. The incision began just below the half way mark between the nose and medial canthus and following the angle formed by the nasal and lacrimal bones. The incision was extended to bone depth with an effort to spare the angular vein to avoid excessive bleeding. Then a self-retaining retractor was placed. After some blunt dissection to free up the skin and the orbicularis oculi muscle, periosteal elevator was used to reflect the periosteum off the lacrimal bone medially and laterally. This separated the lacrimal sac from its bony fossa. After breaking through the thin part of the lacrimal bone separating the nasal mucosa from the sac, the nasal mucosa was elevated from the bone. Next with the Kerrison rongeur the bony stoma was enlarged. The lacrimal sac and nasal mucosa were then cut vertically in an "I" configuration and both posterior flaps were sutured together using 6.0 vicryl.

After dilating the puncta and intubating the canaliculi with the DCR tube, the DCR tube was prepared by making three to four knots at different places. Ultimately, it was passed through the medial meatus. Then the anterior mucosal flaps were sutured with 6.0 vicryl and the wound was closed layer by layer. The skin was then approximated using a subcutaneous running 6.0 vicryl stitch and the nose was repacked with gauze soaked in lidocaine and epinephrine overnight. Intraoperative complications if occurred were noted on a proforma.

Post-operatively, 250mg ampicillin plus 250 mg cloxacillin TID for 5 days, serratiopeptidase 5 mg TID×10 days (anti-inflammatory and anti-tumefacient) and paracetamol 500 mg × 2 TID for pain were administered. On the first post-operative day the nasal packing was removed. Dexamethasone 0.1% QID with chloramphenicol 0.5% QID ophthalmic solution for the

eye, as well as dexamethasone 0.1% with chloramphenicol 0.5% ointment BID × one month for the wound were prescribed to all the patients.

Follow up was at day 1, 1st week to remove the skin stitch, after one month and on 6th month for DCR tube removal. During postoperative visits, patients were asked about symptomatic resolution of epiphora and assessed with patency on irrigation, fluorescein dye disappearance test, and intranasal examination. All patients were followed up for at least 6 months.

Surgical success was defined by patient's resolution of symptoms with patency on irrigation. Surgical failure was defined as no symptomatic reduction in epiphora and/or an inability to irrigate the lacrimal system postoperatively. Complaints and complications, if any, were noted on all visits.

RESULTS

A total of 61 patients were included in the study with a mean age of 37.16 ± 12 years. Most of the operated patients were females (77.05%) with a nearly equal distribution between left and right eyes. One patient (male) was operated bilaterally on separate dates. Most common presenting complaint of the patients was epiphora (67.21%) then intermittent pus (31.14%), pain/burning (11.48%), itching (8.2%), morning stickiness (6.56%), and swelling (4.92%). The Intraoperative complications were unable to suture posterior flap in 3 patients (4.92%), excessive bleeding above 100ml in one patient, snipping of puntum one patient and unable to pass DCR tube in one patient.

None of the patients had uncontrolled intranasal bleeding, cardiovascular event or local anesthesia toxicity during the surgery.

Table 1: Post operative complications of DCR.

Post operative complications	No. of patients (n = 61)
Ecchymosis	14.75%
Infection of the wound site	3.27%
Epiphora	3.27%
Prolapsed tube	3.27%
Bleeding	1.63%
Primary open angle glaucoma	1.63%
Stoma and common canaliculus fibrosis	1.63%

18.03% patients complained of pain on the 1st day and 1st week follow up. One patient complained of pain on 1 month follow up. Complaint of epiphora was noted in two patients (3.27%); one at 1st month and one at 6 month follow up. Syringing was done and in both cases patency was positive. The most common post-operative complications noted in follow up visits was ecchymosis in 14.75% (table 1).

Among the Prolapsed tube, one tube was pushed back through the stoma; the other was not and was removed at 1.5 months. In all cases of possible failure because of complication (infection, prolapsed tube, stoma fibrosis), patency was evaluated and determined to be patent. Bleeding was either wound hemorrhage or epistaxis which was treated conservatively, including nasal spray and/or packing. Homeostasis was achieved with no secondary hemorrhage requiring surgical intervention. The operation was declared successful by the objective demonstration of a patent nasolacrimal system through irrigation. Anatomical patency and symptom relief was achieved in all patients.

DISCUSSION

In areas of the world where post-operative follow-ups can be few or non-existent, a practical and economical surgical technique with a high percentage of success is very important. The health and economic benefits of external techniques over endoscopic has been described [8] and this is especially true in rural and developing areas. McNab[9] has shown EX-DCR under LA with sedation to be quite effective and Ciftci[6] also showed success without sedation. In an effort to streamline protocol and make every patient as comfortable as possible with little or no complications, we chose to use sedation.

3.27% of our patients returned with complaints of epiphora and 1.63% returned with stoma scarring. According To Ben Simon[10] characteristics of surgical failure in DCR include (1) no marked improvement in tearing (2) any episode of postoperative dacrocystitis (3) inability to irrigate the lacrimal system postoperatively (4) postoperative nasal endoscopy with scarring in the intranasal osteotomy or no visualization of fluorescein dye. This gives a surgical success rate of at least 95% in our study. Our level of 95% can even be debated under part (1) of the definition because epiphora had improved in these patients since the operation.

In addition to surgical success of outcome, the

choice of nerve blocks/infiltrations sets our procedure apart from those published previously. Ciftci[6] used five separate blocks, whereas in our study we anesthetized three nerves in one injection. We found no need for the block of the external nasal branch of the infraorbital nerve due to lidocaine nasal packing and overlap with our infraorbital block.

Bleeding precautions are of importance during EX-DCR procedures[11] and we feel use of lidocaine 2% with 1:200,000 adrenaline provides adequate vasoconstriction. Hosal et al[12] showed that 3% lidocaine and oxyetazoline was effective and Ciftci[6] used 3% lidocaine with 1:100,000 epinephrine with good effect. In contrast to GA where coughing, retching, airway obstruction and the use of vasoactive medications can cause an increase in venous pressure,[13] LA remains devoid of such issues and has lower amounts of blood loss when even the same agents are used.[6]

Prevention of secondary hemorrhage after EX-DCR is a concern, and successful precautions have been addressed in previous works.[14] We noted zero cases of secondary hemorrhage which is similar to previously published reports of 3.9%[15] and under 1%.[6]

One post-operative complication of note was our inability to suture the posterior flap in 4.92% of patients. Differing reports have been noted in the past[16, 17], but the report from a head to head trial is that double-flap anastomosis has no advantage over DCR with only anterior flaps, and is easier to perform.[17] Three of our patients who did not have the posterior flap closed also did well with no complications.

Another interesting complication of note was primary open angle glaucoma requiring trabeculectomy at 1.5 months post-op from the DCR. This patient had elevated pressures pre-operatively and the need for surgery is most likely unrelated, especially taking into account the high rate of glaucoma in the patient population of the Northern Areas. Yet still, DCR might have complicated issues post-operatively. Retrospectively the DCR could have been postponed until after the trabeculectomy. One prior case report of closed – angle glaucoma has been reported in the literature,[19] but no prior cases of open-angle as a result of DCR surgery were found.

The complication of post-operative infection was managed by ciprofloxacin 500mg BID for 10 days for one patient presenting on post-op 1st week (Ciprofloxacin was given again plus doxycycline 100 mg BID for ten days when the patient presented again at 6 months) while another was given amoxicillin on presentation at post-op 1.5 months. Of note, one infection was a patient noted to be in poor hygiene and non-compliant in wound – care.

All complications were evaluated for patency as mentioned in the Results and were determined to be patent. The fact our procedure is outpatient in nature emphasizes our cost efficacy. Previous reports published hospital stays of 1 – 3 days on average[6] adding unwanted cost to the system and to the patients.

Also of note were the demographics of this study. Our patient's mean age was 37.16 years old and 77.05% of them were women. Other reports have noted a similar predominance of women.[6,9] Previous reports of the age of patients undergoing DCR (using studies which included the general population) documented 64[5], and 59.6[9] years which were considerably older then our cohort. The lower age of our patients could be due to genetics or the unhygienic, dry, dusty conditions in the Northern Areas. Both genetics and/or environmental factors could exacerbate a NLDO to present earlier in life.[20]

CONCLUSION

If EN-DCRs are not recommended because of the risks of GA or simple impracticality, EX-DCR under LA with sedation is a safe and highly effective alternative technique in terms of surgical outcome.

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