ORIGINAL ARTICLE

A COMPARATIVE STUDY OF SUCCESS RATE AND COMPLICATIONS OF EXTERNAL DACRYOCYSTORHINOSTOMY AND LASER ASSISTED DACRYOCYSTORHINOSTOMY

Damayanti M. Suranagi[1], B. I. Mirajkar[2], A. V. Revankar[3], Madhuri Parande[4]

HOW TO CITE THIS ARTICLE:
Damayanti M. Suranagi, B. I. Mirajkar, A. V. Revankar, Madhuri Parande. "A Comparative Study of Success Rate and Complications of External Dacryocystorhinostomy and Laser Assisted Dacryocystorhinostomy". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 16, April 20, 2015; Page: 2412-2415.

ABSTRACT: PURPOSE: To compare the success rate and complications of external dacryocystorhinostomy (ExDCR) and transcanalicular laser assisted dacryocysto-rhinostomy (TCL-DCR) surgeries performed in patients with primary acquired nasolacrimal duct obstruction. **METHODS:** Sixty four patients with the diagnosis of primary acquired nasolacrimal duct obstruction were studied. Study period was 18 months. 30 patients in group A underwent Ex DCR, 34 patients in group B underwent TCL-DCR. Cases were followed up periodically for 6 months to note any complications and failure of the procedure. **RESULTS:** The patients in both the groups belonged to the age group of 18-65 years. In group A, failure was seen in 2 cases (6.6%) and complications were seen in 7 cases (23.33%). In group B, failure was seen in 3 patients (8.8%) and complications were seen in 2 patients (5.8%). The success rate of Ex DCR and TCL-DCR was found to be 93.4% and 92.2% respectively. **CONCLUSIONS:** The success rate of Ex DCR was comparable to that of TCL-DCR; however, complications were more in the former. TCL-DCR avoids post-operative morbidity and excessive tissue injury. Hence, we conclude that TCL-DCR was less traumatic, less time consuming, and had better cosmetic outcome.
KEYWORDS: Dacryocystorhinostomy, Nasolacrimal duct obstruction.

INTRODUCTION: In treatment of patients with primary acquired nasolacrimal duct (NLD) obstruction, external dacryocystorhinostomy (Ex DCR) is the gold standard. DCR was first described by Toti in 1904 as an external approach to the sac through a skin incision in the medial canthus, resecting the adjacent lacrimal sac and nasal mucosa with their intervening bone.[1]

Near the end of 1980s with the development of high-resolution fiber-optic endoscopes, satisfactory images were obtained, and as a consequence endonasal and transcanalicular laser DCR techniques were launched.[2,3] Transcanalicular laser assisted dacryocystorhinostomy (TCL-DCR) was first introduced by Levin et al. using cadavers in 1992.[4]

The present study prospectively evaluated surgical success and complications in patients with nasolacrimal duct obstruction treated with Ex DCR and TCL-DCR and comparison between the two.

METHODOLOGY: 64 patients presenting with primary acquired nasolacrimal duct obstruction during the 18 months (January 2013 to June 2014) prospective study period were enrolled in the study. 30 patients underwent Ex DCR and were grouped into group A. Group B comprised of 34 patients who underwent TCL-DCR.

All patients underwent Ear, Nose and Throat (ENT) evaluation prior to surgery. Patients having canlicular block, lid pathology or nasal pathology contributing to the epiphora were excluded. Nasolacrimal duct (NLD) blockage was confirmed by syringing.

Investigations included routine blood tests such as Complete Blood Count, Bleeding time, Clotting time and Random blood sugar. All patients were operated under local anaesthesia. All patients were followed up for six months.

SURGICAL TECHNIQUE: GROUP A: The nasal cavity is packed with a ribbon gauge soaked in xylocaine with adrenaline (1:200,000). A curvilinear skin incision was made 8mm medial to medial canthus. Medial palpebral ligament was exposed by blunt dissection and cut with scissors to expose the anterior lacrimal crest. After exposing the anterior lacrimal crest, the periosteum was incised and periosteal elevator used to reflect it on the lateral side. The blunt dissector was then used to separate the sac from the lacrimal fossa. Lamina papracea and posterior half of the lacrimal fossa was fractured with small end of blunt dissector. Lacrimal bone and frontal process of maxilla was punched with Citillis's bone punch and an ostium of 12-14mm was fashioned. Haemostasis achieved by packing with adrenaline. A Bowman's lacrimal probe was passed through the punctum and sac identified. The lacrimal sac was opened in a longitudinal fashion to form anterior and posterior lacrimal flaps. The nasal mucosa was cut in a similar fashion. The anterior and posterior flaps were sutured by using 6-0 chromic catgut suture. The incision was closed in layers using 6-0 chromic catgut for the orbicularis muscle and 6-0 silk for closing the skin incision. After 24 hours nasal pack was removed.

Postoperatively patients were given systemic oral antibiotics and analgesics for 5 days and local antibiotic eye drops for 2 weeks.

GROUP-B: A diode laser fiber (980 nm diode laser in repetitive pulse mode with laser settings of power 10W, pulse length 90ms, pause between pulses 50m) is inserted through the lower punctum upto the medial wall of the sac. An opening is created by ablating the posteriormedial wall of the sac, bone forming the lacrimal fossa and adjacent nasal mucosa. Once a satisfactory ostium is created, duct syringing is done to check the patency of the ostium.

All patients were put on systemic antibiotics for period 5 days and local antibiotic steroid eye drops and nasal drops 3 times daily for 3 weeks on treated side.

All patients were post-operatively monitored on 1st day and followed up after 1 week, 1 month, 3 months and 6 months to assess the surgical success and for the presence of any complications like intra operative excessive bleeding, post-operative wound dehiscence, suture granuloma and synechiae formation.

Success was defined as patent NLD assessed by Lacrimal sac syringing with saline performed from the lower punctum at every follow up. Non patent NLD and recurrence of epiphora were considered as failure.

Data was compiled and statistical analysis was done and the results of both groups were compared. (Details of statistical tests applied to compare both groups).

RESULTS: Out of 64 patients enrolled into the study, 30 underwent Ex DCR (group A) and 34 patients underwent TCL-DCR (group B). The patients who underwent Ex DCR (group A) belonged to age group of 20-65 years with 14 males and 16 females. Surgery was done on the right side in 14 patients and left side in 16 patients. Failure of the surgical procedure was noted in 2 patients (6.6%). Remaining 28 patients had surgical success (93.4%). Complications were seen in 7

patients (23.33%). 3 patients had excessive bleeding intraoperatively. 2 patients had wound dehiscence, 2 patients had suture granuloma in the post-operative period.

Group B patients who underwent TCL-DCR belonged to age group of 18-65 years with 14 males and 20 females. Surgery was done on the right side in 13 patients and left side in 21 patients. Failure was noted in 3 patients (8.8%). Remaining 31 patients had surgical success (92.2%). Complications were seen in 2 patients (5.8%). 1 patient had excessive bleeding intraoperatively and 1 patient had synechiae formation.

DISCUSSION: The success rates of TCL-DCR are generally lower than those of external DCR, which is considered to be the "gold standard".[5-7] Success rates of external DCR usually range between 85-99%, and are usually greater than 90%.[8,9] However, the advantages of TCL-DCR over external DCR are lack of scar development, less morbidity, no need for general anaesthesia, diminished perioperative and postoperative bleeding, intact pump mechanism because of unaffected medial canthal tendon and a less invasive procedure. The technique can be easily done under local anaesthesia.

Various studies have compared the two procedures regarding their success rate and complication rate. In a study conducted by Taskiran et al, out of 80 patients, 46 patients underwent Ex DCR and 34 were subjected to TCL-DCR. Among the 46 who were taken up for Ex DCR, 14 experienced mild to severe perioperative bleeding. 2 patients out of 34 who underwent TCL-DCR had medial turbinate injury. The perioperative complication rate was significantly different between the groups (P = 0.004). Success in relieving symptoms was 89.1% for Ex DCR and 79.4% for TCL-DCR.[10]

Balikoqlu et al. in their study found Ex DCR and TCL-DCR had similar success and complication rates in patients with primary acquired nasolacrimal duct obstruction. The most common complications were the formation of granulation tissue (16.3%) and intranasal synechiae (9.8%), all of which led to surgical failure and were more frequent in the TCL-DCR group.[11]

In our study, the success rates of Ex DCR and TCL-DCR were 93.4% and 92.2% respectively which are comparable. Failure rates were 6.6% (2 patients) and 8.8% (3 patients) respectively, which are again comparable. However, complications were observed in 7 patients (23.33%) who underwent Ex DCR as compared to 3 patients (92.2%) of TCL-DCR group.

CONCLUSION: The success rate of the two procedures was comparable; Ex DCR- 93.4% and TCL-DCR 92.2%. However, the rate of complications was lower in patients who underwent TCL-DCR.

TCL-DCR was found to be less traumatic, less time consuming and cosmetically superior. It avoided excessive tissue injury intra-operatively and reduced post-operative morbidity as compared to Ex DCR.

REFERENCES:

1. Wood JR. Manual of endoscopic lacrimal and orbital surgery. 1st ed. Philadelphia: Elsevier; 2004.

2. Massaro BM, Gonnering RS, Harris GJ. Endonasal laser dacryocystorhinostomy: a new approach to nasolacrimal duct obstruction. Arch Ophthalmol. 1990; 108: 1172–1176. [PubMed]
3. Tsirbas A, Wormald PJ. Mechanical endonasal dacryocystorhinostomy with mucosal flaps. Br J Ophthalmol. 2003; 87: 43–47. [PMC free article] [PubMed]
4. Levin PS, Stormogipson DJ. Endocanalicular laser-assisted dacryocystorhinostomy. An anatomic study. Arch Ophthalmol. 1992; 110: 1488–1490. [PubMed]
5. Christenbury JD. Translacrimal laser dacryocystorhinostomy. Arch Ophthalmol. 1992; 110: 170–171.[PubMed]
6. Pearlman SJ, Michalos P, Leib ML. Translacrimal transnasal laser-assisted dacryocysorhinostomy. Laryngoscope. 1997; 107: 1362–1365. [PubMed]
7. Alanon Fernandez MA, Martínez Fernández A, Cardenas Lara M. Técnica de dacriocistorrinostomia transcanalicular usando el láser diodo. Arch Soc Esp Oftalmol. 2004; 79: 325–330. [PubMed]
8. Hartikainen J, Antila J, Varpula M, et al. Prospective randomized comparison of endonasal endoscopic dacryocystorhinostomy and external dacryocysto-rhinostomy. Laryngoscope. 1998; 108: 1861–1866.[PubMed]
9. Saiju R, Morse LJ, Weinberg D, et al. Prospective randomised comparison of external dacryocystorhinostomy with and without silicone intubation. Br J Ophthalmol. 2009; 93: 1220–1222.[PubMed]
10. Taskiran CA, Karadaq O, Arikan S, Gencer B, Kara S. Comparison of transcanalicular diode laser dacryocystorhinostomy and external dacryocystorhinostomy in patients with primary acquired nasolacrimal duct obstruction. Lasers Surg Med. 2014 Apr; 46(4):275-80.
11. Balikoglu-Yilmaz M, Yilmaz T, Taskin U, Taskapili M, Akcay M, Oktay MF, Eren S. Prospective comparison of 3 dacryocystorhinostomy surgeries: external versus endoscopic versustrans-canalicular multidiode laser. Ophthal Plast Reconstr Surg. 2015 Jan-Feb; 31(1): 13-8.

AUTHORS:

1. Damayanti M. Suranagi
2. B. I. Mirajkar
3. A. V. Revankar
4. Madhuri Parande

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Ophthalmology, KIMS, Hubli.
2. Consultant, Department of Ophthalmology, Mirajkar Hospital, Hubli.
3. Consultant, Department of Ophthalmology, Vithoba Netralaya, Hubli.
4. Post Graduate, Department of Ophthalmology, KIMS, Hubli.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Damayanti M. Suranagi,
"Anugrah" 13th Cross,
Nirmal Nagar,
Dharwar-3.
E-mail: damayantisuranagi@gmail.com

Date of Submission: 24/03/2015.
Date of Peer Review: 25/03/2015.
Date of Acceptance: 08/04/2015.
Date of Publishing: 15/04/2015.