Editorial

Endoscopic DCR vs External DCR: What's Best in the Acute Setting?

Arash J. Amadi MD[1,2]

[1]*Department of Ophthalmology, Division of Oculoplastic Surgery, University of Washington, Seattle, WA, USA*
[2]*Seattle Face and Skin, Seattle, WA, USA*

J Ophthalmic Vis Res 2017; 12(3): 251-253

Dacryocystorhinostomy (DCR) for the treatment of nasolacrimal duct obstruction (NLDO) has been practiced for over a century. First described by Addeo Toti in 1904,[1] primary external DCR has traditionally been considered the gold standard technique demonstrating success rates that approach 98% in patients with primary acquired NLDO.[2,3] Caldwell first described the endonasal (non-endoscopic) approach in 1893.[4] However, this approach fell out of favor because of difficult visualization of the endonasal anatomy with the instrumentation at that time. The modern endoscopic transnasal DCR was described by McDonogh and Meiring in 1989.[5] With newer, more advanced instrumentation, endoscopic surgery has become more and more popular, and with increased experience, the success rates have begun to approach those of external DCR.[6-8] There are many variations in technique in both endonasal and external DCR. These include but are not limited to the use of endoscope, lasers, use of stents, duration of stent placement, use of mitomycin-C, use of powered tools (high speed drill and ultrasonic handpieces) vs non-powered tools (rongeurs), formation of sac/nasal mucosal flaps and whether or not they are sutured, glued, or just approximated, and the use of post-operative antibiotics and steroids (oral and/or topical). There are so many variables that it is difficult, if not impossible, to determine the optimal method of performing the DCR, and there are almost as many variations as there are surgeons. Furthermore, the differences in the etiology of nasolacrimal duct obstruction (NDO), i.e., primary acquired nasolacrimal duct obstruction (PANDO) vs secondary acquired (SANDO) may affect success rates. Despite all these variables and variations, it cannot be denied that the success rates of endoscopic DCR have improved in the last 2 decades.[6-8] Furthermore, the improvements in techniques and instrumentation have led to increased use of this technique in SANDO, and in cases with known increased risk of failure. These include patients with prior external or endoscopic DCR (revision DCR),[8,9] patients with active dacryocystitis,[10] and patients with history of midfacial trauma,[11] and high dose radiation therapy.[12]

Thus the debate continues with regard to external DCR versus endoscopic DCR. The advantages of external DCR are the direct visualization of the lacrimal sac for identification of intra-sac abnormalities, lack of need for expensive instrumentation, and the ability to form and suture flaps between the lacrimal sac and nasal mucosa; the latter reason is considered to be the main factor for the improved success rate as compared to endoscopic DCR. Disadvantages of external DCR include medial canthal scar and disruption of the orbicularis which may lead to abnormal tear pump, and increased post-op morbidity due to the skin incision.

Endoscopic DCR (endo-DCR), on the other hand, has the benefit of no external incision and scar, no disruption of tear pump anatomy, and the ability to visualize, diagnose and treat endonasal pathology, such as septal deviation or middle turbinate hypertrophy. Disadvantage of endoscopic DCR include cost of instrumentation, steep learning curve of endonasal techniques, and difficulty of suturing the lacrimal sac-nasal mucosal flaps. Despite these disadvantages, with improved instrumentation and technical advancements, success rates of up to 94% has been reported.[13]

The authors Subhash and Sharad present a retrospective, comparative case series comparing the success rates of endo-DCR and external DCR in cases of acute dacryocystitis, which we would consider a "high risk" category due to the acute inflammatory process. As the authors have acknowledged in their paper, endoscopic DCR in the setting of acute dacryocystitis has been well documented with success rates between 83-94%. The authors present a retrospective comparative series between endoscopic DCR in the *acute* setting versus external DCR in the *post-acute* setting, after patients were treated with antibiotics. The authors state that their study is the first published comparative series comparing endoscopic DCR in acute setting with external

DCR in the post-acute setting. Though technically true, it should be noted that Jain et al, published a comparative series of endonasal non-endoscopic DCR with external DCR in similar clinical settings with similar findings.[13]

In the current study, the decision whether to use the endoscopic or external technique was made based on the patients' response to intravenous antibiotics; the patients that had failed 5 days of intravenous antibiotics went on to have endoscopic DCR. The success rate (anatomic and functional) of acute endoscopic DCR was 82%, while the success rate of post-acute external DCR was 89.7%. The authors acknowledge that limitations of their study include the retrospective nature of the study, as well as the selection criteria which inherently picked more aggressive infections to undergo endoscopic DCR. This finding suggests that if endoscopic DCR was utilized during the post-acute setting, its success rate may well have been as high as, or even higher than external DCR. Furthermore, they acknowledge that endoscopic cases were performed by a different surgeon which could be a confounding factor. The authors discussed a variety of factors that they postulate may have affected their decreased success rates of endo-DCR as compared to other series, such as duration of symptoms (longer is worse), age of patients (younger is worse) or repeated bouts of dacryocystitis (worse), and lack of silicone intubation or mitomycin use. The authors should be commended for presenting a comparative study that suggests endoscopic DCR success rate approaches that of external DCR, in a subset of patients with acute dacryocystitis. This of course is not an "apples to apples" comparison: there is significantly more inflammation in cases undergoing endoscopic DCR (acute setting) than those undergoing external DCR (post-acute setting). As a final point of discussion, one needs to present post-operative management options which might prove to be paramount when performing "high risk", high inflammation DCR cases. Acute dacryocystitis, in our humble opinion, falls squarely in this category.

Our group has demonstrated endo-DCR to be effective in cases of secondary nasolacrimal duct obstruction, including in cases that we consider "high risk", such as post radiation therapy, post radioactive iodine treatment, granulomatosis polyangiitis (Wegener's), and chronic or prolonged co-existing sinusitis.[14] We have also demonstrated the success rate of endoscopic DCR to be equal to external DCR in cases after radiation therapy to the midface for malignancy, albeit in a small series.[15] Radiation therapy to the midface region induces extensive sinonasal mucosal inflammation. We believe that the improved success rate in that series, and in other "high risk" cases of SANDO, is due to the addition of our post-operative management protocol consisting of nasal irrigation with the glucocorticoid steroid budesonide, and post-operative endoscopic nasal debridement, which are becoming the standard of care after sinus surgery.[16,17]

The postoperative protocol consists of sinus saline irrigation four times a day for two weeks tapering to twice a day for 2 weeks, with budesonide 0.6mg/2 ml added to saline irrigation mixture (240 ml saline) in a sinus irrigation bottle for two of the irrigations per day. Patients also have postoperative follow- up appointments at weeks two and six for endoscopic sinonasal debridement.

We strongly endorse endoscopic debridement at postoperative week 2 since small, early inflammatory/cicatricial blockages can regularly be encountered, exacerbated by the granulation process. Office endoscopic debridement allows removal of early granulation tissue to help ensure patency of the nasolacrimal system. In cases with prolonged inflammation, additional post-operative debridement can be performed every 2 weeks.

In our protocol, we routinely use silicone stents for an average of 4-6 weeks, but some groups have demonstrated good success rates even without stents. In cases of "high risk" SANDO with prolonged duration of SANDO, such as post radiotherapy and Granulomatosis Polyangiitis, we advocate the extended use of stents. Admittedly, this is more based on anecdotal experience rather than evidence based medicine. Additionally, collaboration with an experienced sinus surgeon for postoperative care in addition to intraoperative endoscopic co-surgery should be considered, especially for the ophthalmologist that is in the beginning stages of what can be a steep learning curve.

In conclusion, Subhash and Sharad have again demonstrated the efficacy of endoscopic DCR in the setting of acute dacryocystitis, though with a slightly lower success rate as compared to external DCR in the post-acute setting, as an "apple to oranges" comparison. They have confirmed that endoscopic DCR in this setting can shorten treatment duration and hospitalization. We postulate, that with the addition of our recommended post-operative management protocol of budesonide nasal irrigation and nasal debridement, the success rate of endoscopic DCR in the high inflammatory state of acute dacryocystitis can be further improved and possibly even surpass the success rate of external DCR in the post-acute phase.

REFERENCES

1. Toti A. Nuovo metodo conservatore di cura radicale delle suporazioni chroniche del sacco lacrimale. *Clin Mod Firenze* 1904;10:385-389.
2. Tarbet KJ, Custer PL. External dacryocystorhinostomy. Surgical success, patient satisfaction, and economic cost. *Ophthalmology* 1995;102:1065-1070.
3. Dolman PJ. Comparison of external dacryocystorhinostomy with nonlaser endonasal dacryocystorhinostomy. *Ophthalmology* 2003;110:78-84.
4. Caldwell GW. Two new operations for obstruction of the nasal

duct, with preservation of the canaliculi and an incidental description of a new lacrimal probe. *N Y Med J* 1893;57:581-582.
5. McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. *J Laryngol Otol* 1989;100:585-587.
6. Ben Simon GJ, Joseph J, Lee S, Schwarcz RM, McCann JD, Goldberg RA. External versus endoscopic dacryocystorhinostomy for acquired nasolacrimal duct obstruction in a tertiary referral center. *Ophthalmology* 2005;112:1463-1468.
7. Huang J, Malek J, Chin D, Snidvongs K, Wilcsek G, Sacks R, et al. Systematic review and meta-analysis on outcomes for endoscopic versus external dacryocystorhinostomy. *Orbit* 2014;33:81-90.
8. Marcet MM, Kuk AK, Phelps PO. Evidence-based review of surgical practices in endoscopic endonasal dacryocystorhinostomy for primary acquired nasolacrimal duct obstruction and other new indications. *Curr Opin Ophthalmol* 2014;25:443-448.
9. Paik JS, Cho WK, Yang SW. Comparison of endoscopic revision for failed primary external versus endoscopic dacryocystorhinostomy. *Clin Exp Ophthalmol* 2013;41:116-121.
10. Kamal S, Ali MJ, Pujari A, Naik MN. Primary powered endoscopic dacryocystorhinostomy in the setting of acute dacryocystitis and lacrimal abscess. *Ophthal Plast Reconstr Surg* 2015;31:293-295.
11. Ali MJ, Naik MN. Image-Guided Dacryolocalization (IGDL) in traumatic secondary acquired lacrimal drainage obstructions (SALDO). *Ophthal Plast Reconstr Surg* 2015;31:406-409.
12. Sweeney AR, Davis GE, Chang SH, Jian-Amadi A. Endoscopic dacryocystorhinostomy following head and neck radiation therapy. *Orbit* 2017;36:30-34.
13. Jain S, Ganguly A, Singh S, Mohapatra S, Tripathy D, Rath S. Primary nonendoscopic endonasal versus delayed external dacryocystorhinostomy in acute dacryocystitis. *Ophthal Plast Reconstr Surg* 2016 [Epub ahead of print].
14. Sweeney AR, Davis GE, Change SH, Amadi AJ. Outcomes of endoscopic dacryocystorhinostomy in secondary acquired nasolacrimal duct obstruction: A case-control study. *Ophthal Plast Reconstr Surg* 2016 [Epub ahead of print].
15. Sweeney AR, Davis GE, Change SH, Jian-Amadi A. Endoscopic dacryocystorhinostomy following head and neck radiation therapy. *Orbit* 2017;36:30-34.
16. Welch KC, Thaler ER, Doghramji LL, Palmer JN, Chiu AG. The effects of serum and urinary cortisol levels of topical intranasal irrigations with budesonide added to saline in patients with recurrent polyposis after endoscopic sinus surgery. *Am J Rhinol Allergy* 2010;24:26-28.
17. Jang DW, Lachanas VA, Segel J, Kountakis SE. Budesonide nasal irrigations in the postoperative management of chronic rhinosinusitis. *Int Forum Allergy Rhinol* 2013;3:708-711.

Access this article online

Quick Response Code:

Website: www.jovr.org

DOI: 10.4103/jovr.jovr_133_17

How to cite this article: Amadi AJ. Endoscopic DCR vs external DCR: What's best in the acute setting? J Ophthalmic Vis Res 2017;12:251-3.