Personal experience in endoscopic dacrocystorhinostomy in patients with nasolacrimal duct obstruction.

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Summary
Data are reported on a series of 52 endoscopic procedures of dacryocystorhinostomy, performed in the Department of Otorhinolaryngology of Al- Diwaniya general teaching hospital, between June 2012 and March 2014. The studied 52 patients (35 female, 17 male, mean age 35 and 33 years, respectively) with nasolacrimal duct obstruction. In all cases, pre-operative diagnosis made by ophthalmologist. All procedures were performed under general anesthesia and surgical times were estimated and recorded; mean time for primary dacryocystorhinostomy was 30 minutes. A silicone stent was inserted in all patients for a period of 4 months. The procedure was successful in 92.3 % of cases. Personal clinical and surgical experience, relating to surgical techniques used in dacryocystorhinostomy, was described.

Aim of the study
This study aimed to estimate the success rate, complications, and time of the procedure aiming to increase the expertise of the surgeon who perform this procedure as estimated by the high success rate and lower operative time and less rate of complications.

Introduction
Stenosis of the nasolacrimal drainage system is encountered in clinical practice both by Ophthalmologists and Otorhinolaryngologists [1–4].
Causes may be acute and chronic inflammation, trauma and congenital malformations. The Presenting symptoms may be chronic epiphora, swelling of the lacrimal sac with subsequent infection (dacryocystitis), and recurrent conjunctivitis. Endoscopic dacryocystorhinostomy (DCR) is indicated after the failure of medical therapy to achieve resolution of the disease.
Since 1904 [5] , the surgical management for this disease was the external approach, although Caldwell [6] was the first to propose, in 1893, the endonasal approach, was limited by the technology, at that time. The introduction of endoscopes with different degrees of angulation for endoscopic sinus surgery, led to widespread use of endoscopic DCR. The procedure is a great alternative approach for nasolacrimal duct obstruction. The advantages of the endoscopic approach are minor trauma to the tissue, preservation of lacrimal pump function, and reduction of time of surgery. The success rate of endoscopic DCR is comparable to that of the external procedure, with lower morbidity and the possibility to treat associated Sino nasal problems [7–16] .

Patients and methods
Between June 2012 and March 2014, 52 endoscopic DCR procedures have been performed at the Department of

Otorhinolaryngology, Al- Diwaniya general teaching Hospital. Data were collected on 52 endoscopic DCR of whom 35 female, mean age 35 years (range 17-65), and 17 male, mean age 33 years (range 16-64).

All patients presented with epiphora, associated in 43 cases with at least one episode of acute dacryocystitis. In all cases, pre-operative diagnosis made by ophthalmologist with syringing of the lacrimal pathways which shown to be obstructed. In 2 cases, the endoscopic DCR was associated with septoplasty for associated septal deviation.

All procedures were performed under general anesthesia, and surgical times were recorded. the surgical technique involve making a posteriorly based muco-periosteal flap, we detected the medial aspect of the Lacrimal bone, sometimes we did partial resection of the uncinate process when necessary, destruction of the bone layer and exposure of the Lacrimal sac. The osteotomy was then enlarged by using kerrison bone punch from posterior to anterior way, after exposure of the Lacrimal sac, we make an incision on it and remove the medial wall; dilatation and probing the upper and lower puncti and then inserting the silicone stent. merocele or sofratol nasal pack is then inserted in the nasal cavity.

Silicone stent was inserted in all patients for a period of 4 months. Patients were treated in day-hospital regimen and take medications for 1 week after the surgery and advised for nasal douche 2 to 3 times daily and follow up every 2 weeks until the third postoperative month, then monthly until 1 year post operatively.

Results

Total number of patients was 52 , from them 35 females, and 17 were males. With mean age was 35 years for females, and 33 for males (figure 1 and 2). The youngest patient was 16 years age, and the oldest was 65 years.

From all patients, 29 patients had nasolacrimal duct obstruction on the right side, 21 on left side, and 2 patients had bilateral obstruction (figure 3). The mean period of obstruction is 4.5 years (range from 6 months to 12 years).

Of all patients, 13 patients underwent probing under general anesthesia a period prior to this operation, and 8 patients did laser D.C.R. while 31 patients didn't underwent surgery under general anesthesia apart from syringing and irrigations which done at outpatient clinic visit (figure 4). four patients (7.6 %) reported epiphora within a period of 12 months after the surgical procedure.

two of them had sinus preoperatively which closed after the first operation, but it recur after a period range from one to two months from removal of the stent with recurrence of epiphora , one of those two patients with the sinus then treated with a second endoscopic DCR with assistance of laser to open the soft tissue closing the previous stoma, and the sinus closed gradually with disappearance of epiphora, while the others refused the operation.

Mean time for primary surgery was 30 minutes, it is progressively decreased with increasing the surgical experience.

Post-operative complications (figure 5) include; synechia in four patients (7.6%), treated by opening of the adhesions at outpatient clinic with insertion of nasal packs. In one case (1.9%) the stent was accidentally removed by the patient after one month from surgery, and the patient's symptoms not recur and the follow up showed a very nice stoma and good drainage process.

seven patients (13.4 %) develop discomfort at their eye diagnosed as

allergic reaction and treated by the ophthalmologist.

The problem encountered intra operatively was atresia of upper punctum in 2 cases in whom the stent inserted just through the lower punctum.

Figure 1: gender distribution

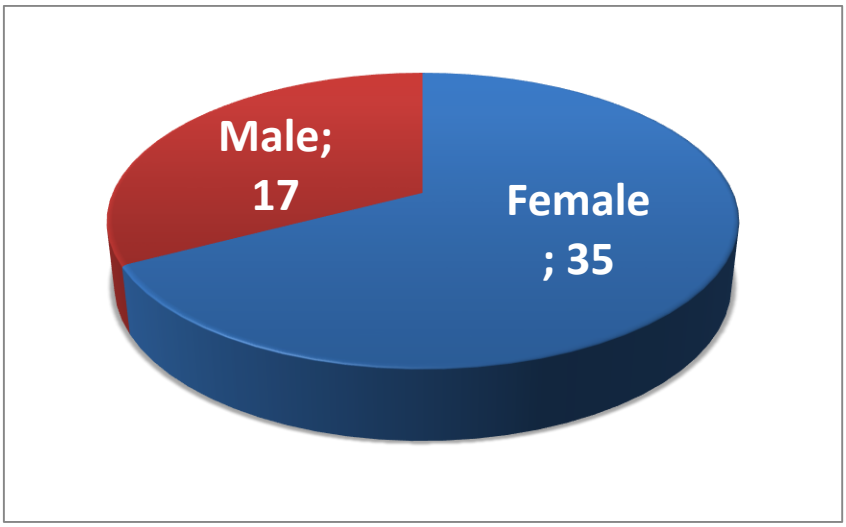


Figure 2: mean age of patients/ years

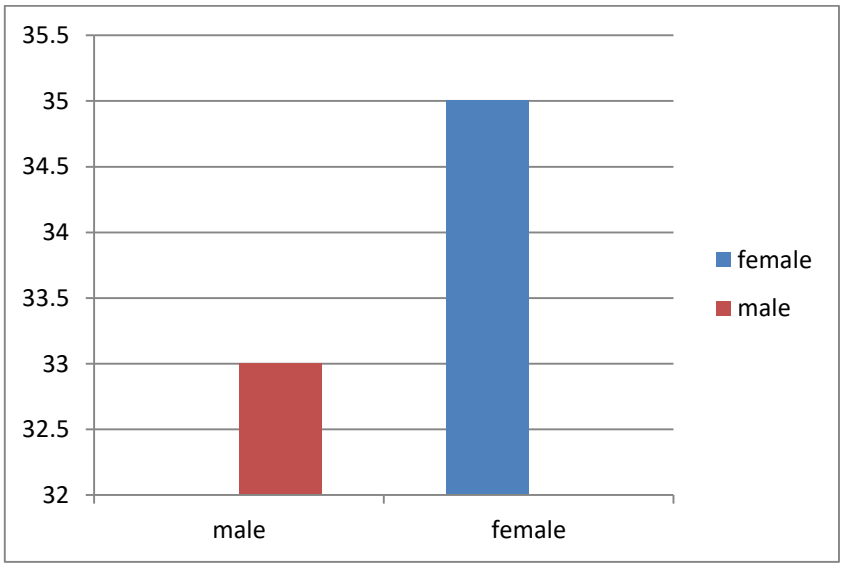


Figure 3: Side of eye involved by nasolacrimal duct obstruction

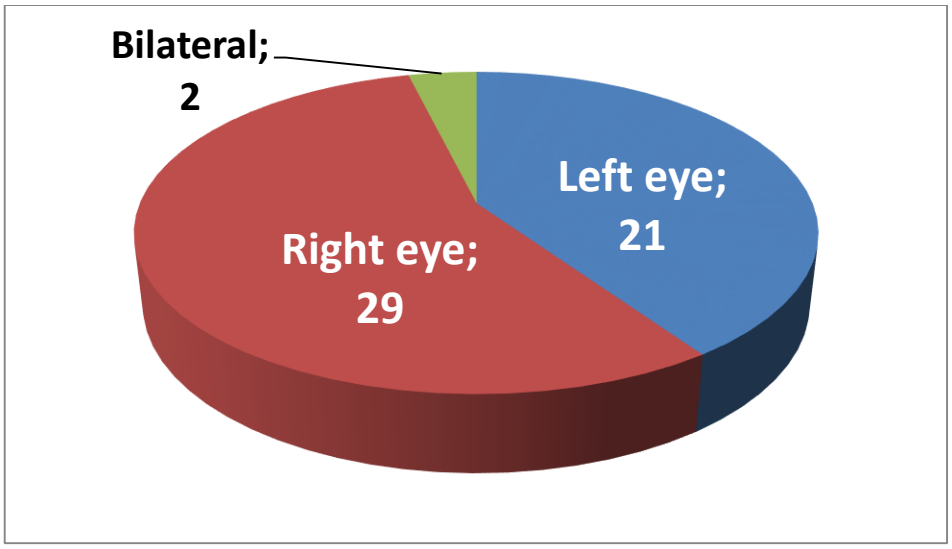


Figure 4: Previous lacrimal apparatus operation

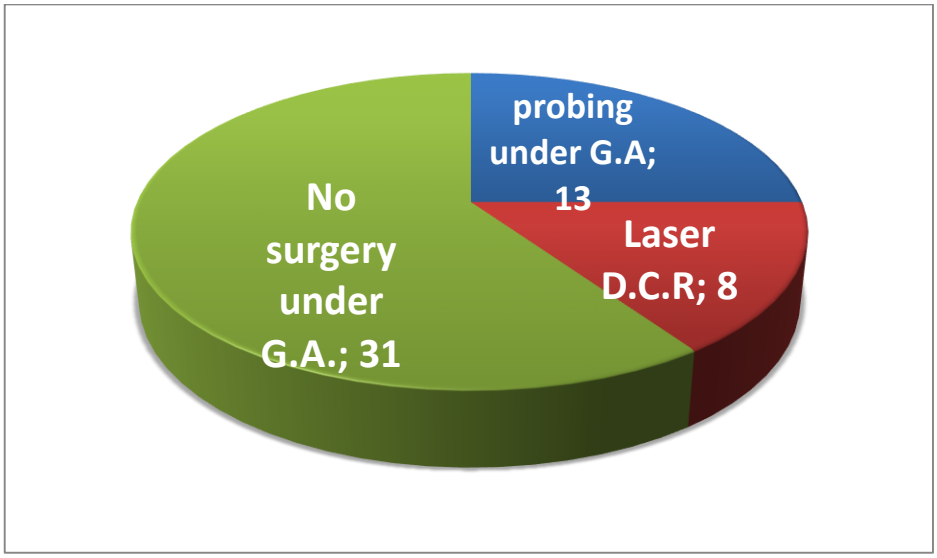
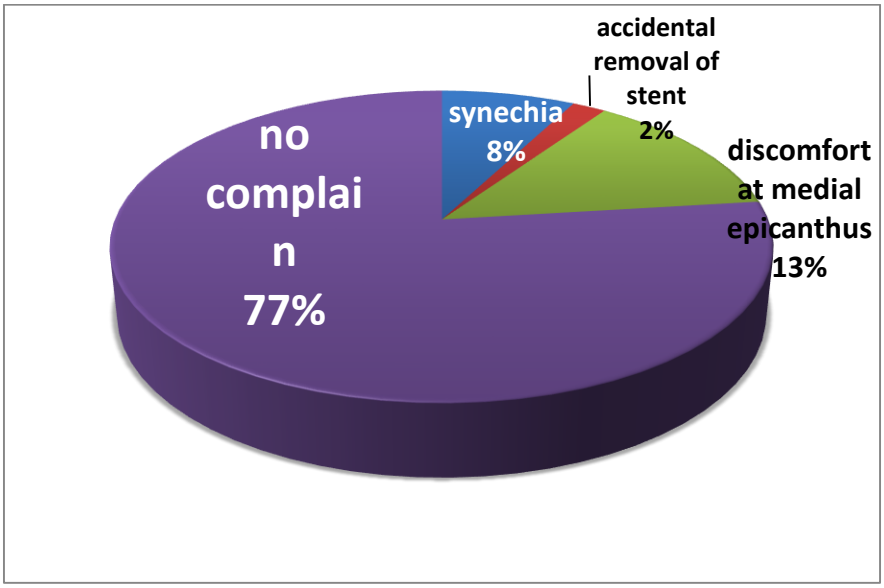


Figure 5: complications



Discussion

In the current study, we used a simplified protocol for diagnosis without routine use of CT scan imaging [17- 24].

Syringing and Irrigation of the lacrimal system establishes correct diagnosis, being an easy, safe, and low cost examination.

most of the anatomical information can be obtained with the use of nasal endoscopic examinations and any anatomical variations can be managed during the surgical procedure.

In the current study, endoscopic DCR showed a success rate of 92.3 % within 1 year follow up period, with complete resolution of symptoms and patent pathway, evaluated by irrigation of the lacrimal system. Success rates reported in the literature range from 79.4% to 96% [1 13 25–29].

Failure rate of 7.6 % occur more in patients with associated sinus (2 of the 4 patients with recurrent disease after surgery).

The complication rate in the current study was 23% while the rate in the study done by Muhammad Azeem Aslam et al [30] was 43%.

The endoscopic approach gives many advantages: less skin trauma and scar tissue formation, with preservation of lacrimal pump function, avoiding trauma to the medial side tendon [1 15 25 29]. Intra-operative bleeding was reduced, thus giving a better visualization of anatomical structures. It may be performed during acute infection (dacryocystitis), where the external approach is contraindicated [31].

In expert hands, surgical times are decreased: data reported in the literature refer to a mean time, for endoscopic DCR, of 30 minutes, while with the traditional technique, mean time is about 45-50 minutes [32, 33]. In the current study, the time required for primary surgical procedures was approximately 30 minutes (range 25-45 minutes) except for associated nasal endoscopic procedures. According to Terbet et al. [32], surgical times are closely related to the surgical experience of the surgeon, confirmed also in the current study. In addition to the benefits of endoscopic approach, this procedure may be performed under local anesthesia, this mean reducing the time of hospitalization.

There are also disadvantages related to the endoscopic technique: the costs of

instrumentation are very high; intra-operative hemorrhage must be avoided; surgical practice requires many years of experience as stressed by many Authors: success rates of 94% and 58% have been reported in two groups of patients that performed endoscopic DCR, with expert and non-expert surgeons, respectively [3].

Stent insertion, associated with topical antibiotic and steroid, maintains the lacrimal system open and prevents infections, resulting in a successful outcome. The stent was inserted for 4 months or more; if removed before this time, it is often the cause of failure.

Conclusions

The endoscopic DCR is considered as a valid alternative method to external procedures in the management of nasolacrimal duct obstruction; it is a less invasive procedure, an effective method with a high success rate and good outcome.

with the introduction of endoscopes and imaging techniques, customized to the nasolacrimal system, allow the site of the obstruction to be detected and to perform a less invasive surgery, respecting the anatomical structures.

Recommendations

We can make another study describing the use of topical applications of mitomycin-C, 0.2 mg/mL for 25 minutes or 0.5 mg/mL for 30 minutes at the site of the stoma made by endoscopy: as proposed that; this antimetabolite reduces scar tissue formation, leading to an increase in the success rate of endoscopic DCR .

References

1. Hartikainen J, Antila J, Varpula M, Puukka P, Seppa H, Grenman R. Prospective randomized comparison of endonasal endoscopic dacryocystorynostomy and external dacryocystorhinostomy. Laryngoscope 1998;108:1861-6. [PubMed[

2. Dietrich C, Mewes T, Kuhnemund M, Hashemi B, Mann WJ, Amedee RG. Long-term follow-up of patients with microscopic endonasal dacryocystorhinostomy. Am J Rhinol 2003;17:57-61. [PubMed[

3. Onerici M. Dacryocystorhinostomy. Diagnosis and treatment of nasolacrimal canal obstruction. Rhinology 2002;40:49-65. [PubMed[

4. Berlucchi M, Staurenghi G, Rossi Brunori P, Tomenzoli D, Nicolai P. Transnasal endoscopic dacryocystorhinostomy for the treatment of lacrimal pathway stenoses in pediatric patients. Int J Ped Otorhinolaryngol 2003;67:1069-74. [PubMed[

5. Toti A. Nuovo metodo conservatore di cura radicale delle suporazioni croniche del sacco lacrimale. Clin Med Firenze 1904;10:385-9.

6. 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. NY Med J 1893;57:581-2.

7. Presutti L. Endonasal dacryocystorhinostomy. Acta Otorhinolaryngol Ital 1995;15:449-53. [PubMed[

8. Bambule G, Chamero J. Endonasal dacryocystorhinostomy (DCR). Rev Med Suisse Romande 2001;121:747-51. [PubMed[

9. McMasters M, Messerli J, Wolfensberger M. Endonasal dacryocystorhinostomy: technique and results. Schweiz Med Wochenschr 2000;116:745-65. [PubMed[

10. Zilelioglu G, Tekeli O, Ugurba SH, Akiner M, Akturk T, Anadolu Y. Results of endoscopic endonasal non-laser dacryocystorhinostomy. Doc Ophthalmol 2002;105:57-62. [PubMed].

11. Weidenbecher M, Hosemann W, Buhr W. Endoscopic endonasal dacryocystorhinostomy: results in 56 patients. Ann Otol Rhinol Laryngol 1994;103:363-7. [PubMed[

12. Piane R, Romano L, Nuti D, Romano F, Passali D. Endonasal dacryocystorhinostomy: a personal experience. Acta Otorhinolaryngol Ital 1990;19:255-9. [PubMed[

13. Par I, Pliskvova I, Plch J. Endoscopic endonasal dacryocystorhinostomy: indications, technique and results. Cesk Slov Oftalmol 1998;54:387-91. [PubMed[

14. Sprekelsen MB, Barberan MT. Endoscopic dacryocystorhinostomy: surgical technique and results. Laryngoscope 1996;106:187-9. [PubMed[

15. Woog JJ, Kennedy RH, Custer PL, Kaltreider SA, Meyer DR, Camara JG. Endonasal dacryocystorhinostomy: a report by the American Academy of Ophthalmology. Ophthalmology 2001;108:2369-77. [PubMed[

16. Puxeddu R, Nicolai P, Bielamowicz S, Serra A, Puxeddu P. Endoscopic revision of failed external dacryocystorhinostomy

17. Pereira L, Dammann F, Duda SH, Reinbold WD, Claussen CD. Value of dacryocystography

in localization diagnosis of lacrimal duct stenosis. Rofo Fortschr Geb Rontgenstr Neuen Bildgeb Verfahr 1997;166:498-501. [PubMed[
18. Hansen MH, Albertsen JL, Nepper-Rasmussen HJ, Hecht PS. Preoperative dacryocystography in patients with epiphora. Ugeskr Laeger 1996;158:5022-5. [PubMed[
19. Helies P, Cosnard G, Pharaboz C, Maille M, Maurin JF. Dacryocystography using CT and MRI. Comparative study apropos of 13 clinical cases. J Fr Ophtalmol 1995;18:763-70. [PubMed[
20. Caldemeyer KS, Stockbergens SM, Broderick LS. Topical contrast-enhanced CT and MR dacryocystography: imaging of the lacrimal drainage apparatus of healthy volunteers. Am J Roentgenol 1998;171:1501-4. [PubMed[
21. Kallman JE, Foster JA, Wulc AE, Yousem DM, Kennedy DW. Computed tomography in lacrimal outflow obstruction. Ophthalmology 1997;104:676-82. [PubMed[
22. Massoud TF, Whittet HB, Anslow P. CT-dacryocystography for nasolacrimal duct obstruction following paranasal sinus surgery. Br J Radiol 1993;66:223-7. [PubMed[
23. Weber Al, Rodriguez-De Velasquez A, Lucarelli MJ, Cheng HM. Normal anatomy and lesions of the lacrimal sac and duct: evaluated by dacryocystography, computed tomography, and MR imaging. Neuroimaging Clin N Am 1996;6:199-217. [PubMed[
24. Mafre L, De Maria M, Todaro E, Mangiameli A, Ponte F, Lagalla R. MR dacryocystography: comparison with dacryocystography and CT dacryocystography. Am J Neuroradiol 2000;21:1145-50. [PubMed]
25. Cokkeser Y, Evereklioglu C, Er H. Comparative external versus endoscopic dacryocystorhinostomy: results in 115 patients (130 eyes). Otolaryngol Head Neck Surg 2000;123:488-91. [PubMed[
26. Liu D, Bosley TM. Silicone nasolacrimal intubation with mitomycin-C: a prospective, randomized, double-masked study. Ophthalmology 2003;110:306-10. [PubMed[
27. Zilelioglu G, Ugurbas SH, Anadolu Y, Akiner M, Akturk T. Adjunctive use of mitomycin C on endoscopic lacrimal surgery. Br J Ophthalmol 1998;82:63-6. [PMC free article] [PubMed[
28. Mantynem J, Yoshitsugu M, Rautiainen M. Results of dacryocystorhinostomy in 96 patients. Acta Otolaryngol 1997;529(Suppl):187-9. [PubMed[
29. Dolman PJ. Comparison of external dacryocystorhinostomy with non laser endonasal dacryocystorhinostomy. Ophthalmology 2003;110:78-84. [PubMed]
30. Muhammad Azeem Aslam (Department of Otolaryngology, Head & Neck Surgery, Islamic International Medical College, Rawalpindi, Pakistan).
31. Lee TS, Woog JJ. Endonasal dacryocystorhinostomy in the primary treatment of acute dacryocystitis with abscess formation. Ophthal Plast Reconstr Surg 2001;17:180-3. [PubMed]
32. Malhotra R, Wright M, Olver JM. A consideration of the time taken to do dacryocystorhinostomy (DCR) surgery. Eye 2003;17:691-6. [PubMed[
33. Eloy P, Bertrand B, Martinez M, Hoebeke M, Watelet JB, Jamart J. Endonasal dacryocystorhinostomy: indications, technique and results. Rhinology 1995;33:229-33. [PubMed]