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Editorial

Lacrimal surgery Glorious past, exciting present era and the audacity of hope for a brilliant future

''Do not fear to be eccentric in opinion, for every opinion now accepted was once eccentric''. – Bertrand Russell (1872–1970)

The evolution of lacrimal disorders and its management amply exemplifies the above stated quote of the 20th century British philosopher Bertrand Russell. Lacrimal surgeries have been a subject of discussion in antiquity with the earliest documented reference being a lacrimal sac incision in the 'Code of Hammurabi' in 2250 BC.[1] The past which appears glorious today had once traveled through many tough terrains in ancient times nurtured by the Egyptians (Ebers Papyrus – 1500 BC), the Greeks (Hippocrates and Celcus – 25 BC) and the Romans (Galen – 200 AD).[1,2] The Arabians chipped in between with their contributions from Ibn Sina and Al Razi in the medieval times. The Modern Dacryology was given impetus with the hallmark anatomical works of Giovanni Morgagni (1682–1771) and Johann Zinn (1727–1759) and equally by the influential lacrimal treatises by Percival Pott (1714–1788) and Johann Schmidt (1759–1809).[3]

'Men love to wonder and that is the seed of science', said the famous 19th century American poet, Ralph Waldo Emerson. Lacrimal surgeries have undergone a sea change in the last two centuries. The original Woolhouse technique (1724) of dacryocystectomy underwent numerous changes in techniques and approaches to the present age but with progressively lesser indications. The external dacyrocystorhinostomy (DCR) had a steeper evolution for obvious reasons from the times when Addeo Toti (1904) first described it to the current day practice with various incisions and lacrimal sac implants.[4,5] With the introduction of rigid endoscopy and better view, endonasal dacyrocystorhinostomy showed a steep resurgence into the practice,[6] more than a century after its original description[7] failed to gain wider acceptance. Endocanalicular laser DCR, however till the present date has failed to gain widespread acceptance despite numerous modifications since its introduction to Dacryology by Levin and Stormogipson in 1992.[8,9] Likewise was the journey of trans-conjunctival DCR (CDCR), which evolved into endoscopic and lesser invasive approaches along with numerous Jones tube modifications.[10,11] Balloon dacryoplasty has evolved mostly in terms of indications rather than instrumentation or techniques.[12,13]

The present era of lacrimal practice is both exciting and at the same time challenging. The state of art equipments including high definition endoscopic systems, diagnostic and therapeutic dacryoendoscopy and higher resolution yet safer imaging are increasingly contributing toward our understanding of the disorders as well as developing minimally invasive surgical options. Many debates today are centered on the approaches to a DCR, ostium size, mitomycin C and intubation. The most recent meta-analysis has been able to shed much needed light into these areas with clinical implications.[14,15] The PEDIG studies have helped greatly in the management of congenital nasolacrimal duct obstructions in terms of clinical decision making and outcomes.[16,17] There is an increasing focus on the Natural Orifice Transcanalicular Endoscopic Surgery (NOTES) for both canalicular and nasolacrimal duct recanalizations under dacryoendoscopic guidance in an effort to avoid a DCR.[18] Although NOTES is quite promising, skepticism is very well justified at this stage. The present era is also taking many attempts to standardize the nomenclatures,[19] drug dosage,[20] introduction of newer terminologies[21] and paradigm shifts in the understanding of lacrimal anatomy.[22,23] The armamentarium of a lacrimal surgeon today is more well equipped than any other time and this very fact brings in more responsibility on us than any other time, to take this forward in every possible way in the future!

The audacity of hope and optimism points toward a brighter future for the patients of tomorrow with lacrimal disorders. However, despite some of the advances highlighted, we still have a long way to go in our understanding and treatment of lacrimal disorders. This would require work on two different fronts with concurrent amalgamation. The first front should be science related and let the second be related to the surgeon. On the science frontier, the need of hour is to demystify the etiopathogenesis of lacrimal disorders primarily that of primary acquired nasolacrimal duct obstruction or PANDO. It would be inappropriate to continue managing lacrimal disorders mechanically without simultaneous efforts to unravel the elusive etiopathogenesis. The key to this, I believe lies with the basic sciences. Embryonic studies to look for regulatory proteins influencing lacrimal primordium and sub adjacent mesenchyme of surface ectoderm during Carnegie stages of development may hold promising clues to understanding of congenital lacrimal disorders. Cytochemical analysis was performed for inflammatory mediators in tears of patients with PANDO and if the culprits are zeroed in on, the search to pharmacologically block them or their receptors in the lacrimal system may have prophylactic value early on in the disease. Lacrimal immunology work on lacrimal drainage associated lymphoid tissues

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(LDALT), its derangements[24] and how differently it behaves from the rest of the immune system should be carried forward to its logical conclusions as this may have great bearing on our understanding of lacrimal physiology. Other avenues of potential research in near future include the lacrimal system stem cell characterization on similar lines as that of lacrimal gland,[25] drug coated stents and electron microscopic inter and intra-cellular changes in lacrimal disorders.

On the second front, the lacrimal surgeon should not only focus on evidence based practice but also constantly endeavor to explore avenues to generate evidence. The research potential needs to be unlocked and academic institutes should strive toward protecting and rearing the endangered species of 'Clinician-Scientists' rather than pure clinicians. The need of the hour is also to cross specialize where it matters! The lacrimal drainage system has a long course within the nasal cavity and it is obvious that a good lacrimal work cannot be done without a good anatomical and surgical knowledge of the nose. Although, the resurgence of EENT (eye, ear, nose, and throat) specialists may not be desirable due to explosion in the knowledge and vast nature of each subject, the benefits of limited cross specialization cannot be over emphasized. Cross specialization also opens up the surgeon to at least some ideas of one's specialty that when appropriately extrapolated to other may have beneficial results. Basic sciences are the key to the future; hence a very good understanding of fundamentals of lacrimal system up to the molecular level would greatly help the lacrimal surgeon in dealing with the disorders both in the lab and the clinics. There should be efforts on part of the lacrimal surgeon to do focused clinical and research work with an emphasis on translational values. The challenge of the future is to set audacious goals and strive hard to achieve them. We as lacrimal surgeons need to remind ourselves frequently of our equally important responsibility to advance medicine and hand it over in a better shape to the next generation and probably beyond them. Are we doing enough on these fronts? If not, let us change that from today!

> ''There is a single light of science, and to brighten it anywhere is to brighten it everywhere''. – Isaac Asimov (1920–1992)

References

1. Hirschberg J. The renaissance of ophthalmology in 18th century. In: Hirschberg J, editor. *The history of ophthalmology*, vol. 1. Amsterdam: Wayenborg publications; 1984. p. 11.
2. Hirschberg J. The renaissance of ophthalmology in 18th century. In: Hirschberg J, editor. *The history of ophthalmology*, vol. 3. Amsterdam: Wayenborg publications; 1984. p. 250–5.
3. Albert DM. Ophthalmic plastics surgery. In: Albert DM, Edwards DD, editors. *The history of ophthalmology*. Cambridge: Blackwell Science; 1996. p. 235–54.
4. Ekinci M, Cagatay HH, Oba ME, et al.. The long term follow-up results of external dacryocystorhinostomy skin incision scar with 'W' incision. *Orbit* 2013;**32**:349–55.
5. De Castro DK, Santiago YM, Cunningham M, et al.. A modified lacrimal sac implant for high risk dacyrocystorhinostomy. *Ophthal Plast Reconstr Surg* 2013;**29**:367–72.
6. McDonogh M, Meiring JH. Endoscopic transnasal dacryocystorhinostomy. *J Laryngol Otol* 1989;**103**:585–7.
7. Caldwell GW. Two new operations for the obstruction of the nasal duct with preservation of the canaliculi. *Am J Ophthalmol* 1893;**10**:189.
8. Levin PS, Stormogipson DJ. Endocanalicular laser assisted DCR. An anatomic study. *Arch Ophthalmol* 1992;**110**:1488–90.
9. Henson RD, Cruz HL, Henson Jr RG, et al.. Post operative application of mitomycin C in endocanalicular laser DCR. *Ophthal Plast Reconstr Surg* 2012;**28**:192–5.
10. Jones LT. Conjunctivodacryocystorhinostomy. *Am J Ophthalmol* 1965;**59**:773–83.
11. Ali MJ, Honavar SG, Naik M. Endoscopically guided minimally invasive bypass tube intubation without DCR: evaluation of drainage and objective outcomes assessment. *Minim Invasive Ther Allied Technol* 2013;**22**:104–9.
12. Becker BB, Berry FD. Balloon catheter dilatation in lacrimal surgery. *Ophthalmic Surg* 1989;**20**:193–8.
13. Ali MJ, Naik MN, Honavar SG. Balloon dacryoplasty: ushering the new and routine era in minimally invasive lacrimal surgeries. *Int Ophthalmol* 2013;**33**:203–10.
14. Feng YF, Yu JG, Shi JL, et al.. A meta-analysis of primary external dacryocystorhinostomy with and without mitomycin C. *Ophthalmic Epidemiol* 2012;**19**:364–70.
15. Feng YF, Cai JQ, Zhang JY, et al.. A meta-analysis of primary dacryocystorhinostomy wit h and without silicone intubation. *Can J Ophthalmol* 2011;**46**:521–7.
16. Repka MX, Chandler DL, Holmes JM, et al.. Balloon catheter dilatation and nasolacrimal duct intubation for treatment of nasolacrimal duct obstruction in after failed probing. *Arch Ophthalmol* 2009;**127**:633–9.
17. Repka MX, Chandler DL, Bremer DL, et al.. Repeat probing for treatment of persistent nasolacrimal duct obstruction. *J AAPOS* 2009;**13**:306–7.
18. Javate RM, Pamintuan FG, Cruz Jr RT. Efficacy of endoscopic lacrimal duct recanalization using microendoscope. *Ophthal Plast Reconstr Surg* 2010;**26**:330–3.
19. Ali MJ, Mohapatra S, Mulay K, et al.. Incomplete punctal canalization: the external and internal punctal membranes. Outcomes of membranotomy and adjunctive procedures. *Br J Ophthalmol* 2013;**97**:92–5.
20. Ali MJ, Mariappan I, Maddileti S, et al.. Mitomycin C in dacyrocystorhinostomy: the search for the right concentration and duration – a fundamental study on human nasal mucosa fibroblasts. *Ophthal Plast Reconstr Surg* 2013;**29**:469–74.
21. Ali MJ, Naik MN. Canalicular wall dysgenesis: the clinical profile of canalicular aplasia and hypoplasia, associated systemic and lacrimal anomalies, and clinical implications. *Ophthal Plast Reconstr Surg* 2013;**29**:464–8.
22. Park J, Takahasi Y, Nakano T, et al.. The orientation of the lacrimal fossa to the bony nasolacrimal canal: an anatomical study. *Ophthal Plast Reconstr Surg* 2012;**28**:463–8.
23. Kakizaki H, Ichinose A, Takahashi Y, et al.. Anatomical relationship of Horner's muscle origin and posterior lacrimal crest. *Ophthal Plast Reconstr Surg* 2012;**28**:66–8.
24. Ali MJ, Mulay K, Pujari A, et al.. Derangements of lacrimal drainage associated lymphoid tissue (LDALT) in human chronic dacryocystitis. *Ocul Immunol Inflamm* 2013;**21**:417–23.
25. Tiwari S, Ali MJ, Balla MM, et al.. Establishing human lacrimal gland cultures with secretory function. *PLoS One* 2012;**7**:e29458.

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