Peri-punctal lesions are commonly seen in patients but rarely cause symptoms of discomfort or epiphora. The most common complaint for patients with peripunctal mass typically is an unsightly mass. Seen here is a slit lamp photograph of a peripunctal nevus. The typical features include swollen lips, fine ramifying vascularity and a slit-like or a pin point opening of the punctum. (Photo Courtesy: Akshay Gopinathan Nair, Mumbai India - shot on an iPhone 12 through a Zeiss SL 800 slitlamp)

Cover image contributor: Akshay Gopinathan Nair
Consultant, Ophthalmic Plastic and Reconstructive Surgery,
Advanced Eye Hospital & Institute, Navi Mumbai India.

Do you have an interesting image that tells a story and can feature on the cover of iPlastics? Send it in with a 100-word description to akshay@drakshaynair.com
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The Oculoplastics Association of India (OPAI)

The Oculoplastics Association of India (OPAI) is holding its 32nd annual conference in the city of Mumbai. This conference will be conducted from the 11th to 13 November 2022. The theme for this meeting is the ‘Confluence of oculoplastics and allied specialities’. Oculoplastic surgeons are often times faced with complex clinical cases which requires us to collaborate with our colleagues from different specialities: infectious diseases, endocrinology, neurology, neurosurgery, maxillofacial surgery, dermatology and many other specialities. Collaborations always lead to sharing of knowledge and a better understanding of the disease process. This, I believe why it is extremely important to always get a different perspective on the same disease process such that it can help us in improving the outcomes for our patients. This unique theme will be championed at the Oculoplastics Association of India meeting in Mumbai registrations for this meeting are now available online at www.mumbaiopai2022.com

The practice of medicine - in the clinic as well as in the operating room seems to have returned to normal after a two year long stint in the ‘COVID-19’ mode. So, it is only natural that conferences and conventions too, return to their in-person formats rather than the virtual avatars. The Asia-Pacific region, in general has been at the eye of the COVID-19 storm and even today there are certain countries that are battling with resurgent waves of the disease. However as has been the case with healthcare over generations: as time goes on, we get better at understanding the disease, in treating it and in preventing it. In this regard, the second half of 2022 will see multiple conferences focused on oculoplastics and oculofacial surgery in the Asia-Pacific region:
Another conference happening in October 2022 is the annual conference of the Nepalese Society for Oculoplastic Surgeons (NESOS). A dynamic young group, NESOS has over 32 Consultant oculoplastic Surgeon members and more than 10 allied health members, holds biannual scientific meeting coordinating with international pioneers Oculoplastic Surgeons and other international oculoplastic society. It is intended that NESOS will continue to evolve and develop its influential national role in education and training, and the promotion of oculoplastic surgery within ophthalmology as well as relation to allied surgical specialties.

The National University Hospital (NUH), Singapore has organized a 3-day symposium – The NUH Ocular Surface, Dry Eyes & Dacryology Symposium from 20th to 22nd October 2022. Put together by Cornea & Ocular Surface, as well as Orbit & Oculofacial teams, this symposium brings together all facets of state-of-the-art knowledge with essential learning for general ophthalmologists, cornea & ocular surface specialists and Oculoplastic surgeons with a special interest in diseases and surgery of the lacrimal drainage system. This course includes a

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Visit [www.nesosnepal.org.np](http://www.nesosnepal.org.np) for abstract submission and registration.

NESOSCON 2022 is going to be the 4th in-person international conference organized by NESOS after a gap of 4 years due to COVID (originally planned for 2020). This will be held in Kathmandu on 21st and 22nd October 2022. Details are available at: [http://nesosnepal.org.np](http://nesosnepal.org.np)
- Cadaveric workshop with skills transfer in the state of art Lacrimal Drainage Surgeries including minimally invasive procedures.
- Live Surgical demonstration of endoscopic lacrimal drainage surgeries – dacryocystorhinostomy (DCR) and endoluminal lacrimal duct recanalization (ELDR) and Symposium on cutting edge knowledge surrounding the care of the Ocular Surface, Dry Eyes & Dacryology.
- Registration and meeting details are available at: https://nuhseye.sg/osdeds2022/
However, the opening up of countries and relaxation of travel restrictions has allowed more in-person meetings to take place. But this doesn’t diminish the importance of crucial online meetings. The Iranian Research Association for Vision and Ophthalmology (IRAVO) is hosting the International Thyroid Eye Disease Society (ITEDS) course in October 2022. ITEDS is conducting this instruction course covering essentials and advanced topics in the field. This online meeting promises to be an exciting journey with world experts in thyroid eye disease with integration of solid basic knowledge, clinical science, clinical and surgical skills. Meeting details are available at: https://iravo.org/regmeeting.aspx

At the peak of the pandemic, meetings conducted through online platforms was the new normal. But now we are eagerly looking forward to ‘in-person’ meetings. Physical meetings are beyond presentations in lecture halls—the silent, ruminant walks through the physical poster exhibits, the networking in the corridors, and the busy buzz of the trade and exhibition halls are equally missed. Physical meetings also allow networking opportunities, reuniting with old colleagues, warm friendly handshakes, and hugs, making new connections—things that we now are longing for.

Here’s to a better time ahead, with more in-person meetings, less uncertainties and lots more learning in the years to come!

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As the APSOPRS president, I would like to brief you on the recent developments of our society. Despite the obstacles and difficulties caused by the pandemic, APSOPRS took full advantage of online cooperation. It seems that different aspects of the APSOPRS work have run smoothly online.

Our APSOPRS webinar series continued with another quality event "APSOPRS webinar-Advance of Orbital Disease and Facial Rejuvenation", which was held on May 21, 2022. 28 world-renowned experts gave wonderful academic reports and attracted more than 13,000 views on bilingual channels (Fig 1-3).

As for the YAPSOPRS online program, 6 of the 11 sessions have already been uploaded on our official website. The program is updated with one session every month and is available for all paid members (Fig 4).

We have also committed to expanding and deepening international cooperation. On July 2nd, the joint APSOPRS & ESOPRS webinar was held after 5 months of preparation. Challenging pediatric cases were shared and discussed (Fig 5-6).
Moreover, we have prepared the special APSOPRS on-demand courses at WOC 2022. And together with the International Thyroid Eye Disease Society (ITEDS), we will participate in the courses of AAO,2022 for the “East Meets West Symposium-Controversies in Thyroid Eye Disease/Graves’ Orbitopathy”.

What comes next will be the APSOPRS session for the Asia-Pacific Academy of Ophthalmology Congress 2023 (APAO Feb,23-26, 2023). We will provide excellent courses of oculoplastic surgery by then. It is also exciting to anticipate the offline gatherings. APSOPRS was invited for an APAO-APSOPRS Joint Scientific Symposium at the Pan-American Association of Ophthalmology (PAAO) 2021 Congress in Buenos Aires, Argentina, which will be held on March,2023. What’s more, APSOPRS was invited to SOE, in June, 2023.

The APSOPRS council meeting was held earlier this August. The issues about international fellowship and member countries were discussed. In the foreseeable future, we anticipate that the traditional fellowship exchange programs will resume, and by then, I look forward to the active participation of the appropriate members (Fig7).
The COVID has halted us from meeting face to face for 3 years. Recently, some domestic offline meetings were held successfully just like pre-pandemic, and I eagerly hope that I can invite you to China for the next APSOPRS annual meeting and the APSOPRS election. We hope to arrange an in-person meeting in Chengdu in June 2023, but the final form is still undecided due to the changing travel policy (Fig 8).

Thanks for your continuous support and wish you all the best.

Warmest Regards,

Dongmei Li
President of APSOPRS
Professor of Department of Ophthalmology
Beijing TongRen Eye Center,
Capital Medical University
Before I go on to the main issue, I’d like to share my secondhand experience about international fellowship. During my clinical fellowship under Dr. Yoon-Duck Kim and Dr. Kyung In Woo, there was a constant stream of young international visiting doctors to observe surgeries by Dr. Kim and Woo. Those doctors had to contact the master surgeons they wanted to visit, took care of all administrative procedures required by the hospital, and came to Korea at their own expense. After completing a one-year (or more short-term) fellowship, they returned to their home country with improved knowledge and skills in OPRS. They were proud of having a good experience abroad, but the proof was usually a small certificate from the hospital they visited. I was also proud of them for their great challenge, but on the other hand, I felt that a system is needed to help promising young doctors do international fellowships more efficiently.

Getting back on track, I am pleased to have this opportunity to speak about APSOPRS International Fellowship Program (IFP). The program has not been launched yet, but many leaders of our society have mentioned the need for our own fellowship program to provide quality education opportunities to young oculoplastic surgeons from our region. Recently, we had an APSOPRS council meeting online and discussed the IFP comprehensively. I would like to introduce the outline of the APSOPRS IFP to attract the member’s attention and seek good opinions.

The aims of APSOPRS IFP include (1) providing education opportunities for improving their clinical/surgical skills and research experience to promising young oculoplastic surgeons from the Asia-Pacific region; (2) supporting the international fellows, especially those from developing countries, to acquire good knowledge and skill of OPRS and to spread it to their home countries; (3) connecting young oculoplastic surgeons socially and academically; and (4) promoting international collaboration between member societies.

Although a small number, our society already has a list of institutions for fellowship exchange, which are on the “Fellowship Exchange” section of the APSOPRS website. The followings are the list of institutions and the senior faculties of each hospital:
Each institution has successfully produced about 5-10 international fellows, based on a long-term fellowship of 6 months to 1 year, in the past 10 years. Due to the issue of medical license, international fellows are allowed to observe or assist surgeries at training centers, but some Singapore hospitals (e.g., SNEC) allow them to operate their own cases under supervision. There are no training centers that provide financial support to their international fellows, but SMC, Korea provides guest house at a very low rate (10US$/day).

There are some academic societies in our field running an international fellowship program. Asia-Pacific Academy of Ophthalmology (APAO) launched an IFP in 2014. They select up to 5 fellows from an APAO member country per year in any subspecialty areas and allow them to have 3- or 12-month fellowship at one of 15 accredited APAO international training centers. International Council of Ophthalmology (ICO) also has produced more than 1,200 international fellows from 84 countries. ICO international fellowship applications are open to residents from low-resources countries listed by the World Bank. All applicants have to pass one or more ICO Examinations to be candidates. The Table shows characteristics of IFP of APAO and ICO:

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<th>APAO</th>
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<tr>
<td>Application criteria</td>
<td>Member countries &lt; 40 years of age</td>
<td>Low-resources countries</td>
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<tr>
<td></td>
<td>Completed residency</td>
<td>Published ≥ 1 original article</td>
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<td></td>
<td>Completed residency</td>
<td>Passed ICO examinations</td>
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<tr>
<td>Number and Duration</td>
<td>≤ 5 fellows / year</td>
<td>3-month</td>
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<td></td>
<td>3- or 12-month</td>
<td>(If other programs including 3-mon glaucoma, 6-mon retinoblastoma, 1-yr genetics, and 1-yr research fellowships)</td>
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<tr>
<td>International training centers</td>
<td>15 centers (Asia, 12; NZ, 1; USA, 2)</td>
<td>140 centers</td>
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<tr>
<td>Support from academic societies</td>
<td>US$ 1,000 for airfare</td>
<td>US$ 6,000 for travel and living expenses (fellowship donors)</td>
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<td>US$ 200/mon for allowance</td>
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Despite getting through a hard time with the pandemic, many leaders and council members of our society agreed that now is the time to start our own fellowship program. We are going to make an organizing committee consisting of current APSOPRS officers and past presidents, and the committee will discuss and decide critical issues for the APSOPRS international programs. In particular, it is necessary to select more qualified international training centers in addition to the current five institutions. We started to receive recommendations and applications for securing more international training centers, and new centers are encouraged to provide international fellows with systematic educational programs, hopefully including financial support.

As an old proverb says, “Stagnant water is bound to rot, and running water doesn’t become fetid.” We all know that knowledge has no borders. We hope that young and promising oculoplastic surgeons in our region will acquire the most up-to-date knowledge across borders and play a leading role in promoting international exchanges in the future. We also hope the APSOPRS International Fellowship Program will be the starting point. We ask for your attention to the program and expect to get a lot of advice from our members.
Surgical Strategies for Revision of Failed DCR by Endoscopic Approach

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Introduction

There are few reports about the overall management and surgical techniques of failed endonasal DCR. When patients with failed endonasal DCR presented at the clinic, it is important to identify the cause of the failure [1]. Previously reported success rates in adults for Endoscopic Revision DCR range from 60% to 94% DCR failure is multifactorial. Scarring of the ostium was the most significant cause and bony ostium malposition, or inappropriate size was found as the less common cause. These causes can all be detected accurately at endonasal revision [2]. Inadequate osteotomy, incomplete sac marsupialization, and cicatricial closure of the ostium were the most common causes of failure and did not significantly differ in the external and endoscopic groups. Meticulous evaluation to identify causative factors for failure and addressing them are crucial for subsequent successful outcomes [3]. For the primary and revision DCR, the keys for successful outcomes include precise localization of the sac, adequate osteotomy sufficient to expose the entire lacrimal sac including the fundus, full-length marsupialization of the sac, and mucosa-to-mucosa approximation to facilitate healing by primary intention without scarring [4].

My Experience

In 2004, I started my lacrimal surgeries as a beginner. Fortunately, I have tried to revise all my failed endoscopic DCRs by myself since 2004. After observing and learning from mistakes, I have found that the most important factors for lacrimal surgeons need to understand are the bony concepts and the flap approximation concepts. Initially in my practice, I did not perform the appropriate size of the bony ostium and I have found that this is the major cause of the failure of the DCR surgery. This chapter would allow me to explain how I used the 45 degree test to evaluate the adequacy of the bony ostium intraoperatively. The flap approximation is the secondarily important factor for the success of endoscopic DCR if we could perform trans nasal primary flap approximation with suturing as well as the external DCR. I started to perform flap suturing for endoscopic DCR in 2005. After many modifications, I have discovered that 4 classifications of flap suturing techniques could be applied for revision lacrimal surgery very practically which would be demonstrated later in this chapter [13]. After the intraoperative and postoperative observation, the mechanism of failed DCR would be explained also in this chapter.
Fig. 1 Normal lacrimal anatomy V.S. Ideal nasal ostium. 1A) Showing side view of normal lacrimal anatomy. L – lacrimal drainage system, F – frontal process of maxillary bone, N – nasal mucosa. 1B) Showing ideal nasal ostium after successful DCR surgery with a history of post lacrimal sac obstruction, O – obstruction at nasolacrimal duct, L – lacrimal mucosa system, F – frontal process of maxillary bone, N – intact nasal mucosa.

Classification and mechanism of failed DCR caused by inadequate osteotomy (bony removal) and inadequate lacrimal and nasal flap approximation

The most two common causes of failure are scarring or cicatricial tissue at the nasal ostium, especially at the level of common canalicular obstruction, and the inappropriate size or location of the osteotomy. The reason for failure from previous DCR surgery may be attributable to an inadequately open window and the abnormal scar tissues encroaching postoperatively.

Regarding the intraoperative findings, the clinical findings of lacrimal and intranasal anatomy could be classified as 1. Failed primary endoscopic DCR

2. Failed primary external DCR and 3. Failed multiple DCRs (Fig. 2A, 2B, 2C). There were a few literatures describing how the mechanism of failed DCR is. The most common cause of the failed DCR in our observation caused by inadequate bony removal of the frontal process of the maxillary bone and lacrimal bone and followed by abnormal cicatricial tissue encroaching over the gap or bare bone between lacrimal and nasal mucosa. The osteotomy could be opened too small and too high or too low because the inexperienced surgeon which may not be able to locate the area of the bone that should be removed properly. In this circumstance, I would divide the frontal process of maxillary bone that related to the level of lacrimal sac to be upper 1/3 and lower 2/3 (Fig 4A). Fig. 2 showed the osteotomy was too small and the residual frontal process of maxillary bone over the upper 1/3 of the lacrimal sac was not removed adequately. How much the cicatricial tissue happens would be related to how much the lacrimal and nasal mucosa were removed or disturbed (Fig. 2A, 2B, 2C). I found that these are very important factors for the failed both failed primary endoscopic and external DCR. There was the study by Paik et al (15) reported a comparison of endoscopic revision for failed primary external versus endoscopic dacryocystorhinostomy. During revisional endoscopic DCR surgery, they found the inappropriately sized and/or localized ostium was significantly more frequent in the previous endoscopic failed DCR group compared with the previous external failed DCR group. Fibrosis at the anastomosis site, canalicular or common canalicular obstruction and membranous obstruction was found more common in the previous external failed DCR group but did not differ significantly between the groups.
This could be explained as same as our findings during our revision surgery that there was more and thicker cicatricial tissue at the medial wall of lacrimal sac mucosa in the previous external failed DCR cases because primary external DCR was approached from transcutaneous or externally and had the more chance that the previous surgeon did not provide the appropriate approximation of lacrimal and nasal mucosa then the cicatricial tissue could be observed more in the medial wall of lacrimal sac mucosa during revision surgery (Fig 2B). On the other hand, in the failed endoscopic DCR case with aggressive nasal mucosa removal and too small osteotomy without disturbance of lacrimal mucosa, the cicatricial tissue could be seen only on the lateral wall of the nasal cavity (Fig. 2A).

In the case of failed primary endoscopic DCR, the nasal mucosa was usually removed or disturbed too much. If the approximation of lacrimal and nasal mucosa could not be properly achieved, then the cicatricial tissue could gradually encroach from the edge of normal nasal mucosa encroaching over the bare bone to lacrimal mucosa and vice versa. (The red area showed scar tissue in Fig. 2A). In this condition, the lacrimal sac may not be opened adequately by the previous surgery and during revision surgery, the surgeon could observe the healthy internal lacrimal mucosa. Once the silicone stent is removed, the recurrence of obstruction could happen as called Sump syndrome.

Mechanism of failed primary external DCR

By the external approach for failed primary external DCR, the surgeon may disturb or remove the lacrimal mucosa too much and nasal mucosa could be opened only area of osteotomy size. If the osteotomy is too small and lacrimal tissue was opened and well lacrimal and nasal flap approximation could not be achieved, the tendency of encroaching of cicatricial tissue over the bare bone by secondary intention healing could occur (The red area in Fig. 2B). In this condition, the more bare bone occurs and there is no appropriate approximation between the lacrimal and nasal mucosa, the thicker of cicatricial tissue over the nasal osteotomy...
could be observed. In these 2 conditions, the patency of created ostium could be initially patent with silicone stent intubation. The lacrimal irrigation may show 100% well flow at the first period postoperatively. Once the silicone stent is removed, the progression of cicatricial tissue could encroach until total blockage could happen (Fig. 2A, 2B and 3A-3E). Revision Endoscopic DCR carries an excellent short-term success rate, which decreases mainly throughout the first 2 years following surgery [5].

Mechanism of failed multiple DCRs with common canalicular obstruction and thick cicatricial tissue on both medial and lateral side of lacrimal sac mucosa

After many times of revision DCRs and overly aggressive pre and intraoperative manipulation of the canalicular system, lacrimal and nasal mucosa, very thick cicatricial tissue on both medial and lateral sides of lacrimal sac mucosa including common canalicular tissue could cause severe failed DCR [6]. This type of failure is the most challenging to perform the revision. If the surgeon has not prepared the plan of management for bony and mucosal flap management properly, very high percentage of failure could happen. (Fig. 2C)

Stalactite and Stalagmite phenomenon for mechanism of failed DCR

After many times of observation during the revision surgery and postoperative intranasal endoscopic examination, I have found that the cicatricial tissue always starts characteristically encroaching from outside to inside or from normal nasal mucosa then covering the bare bone then to lacrimal mucosa and vice versa. The cicatricial tissue could be observed more and more by the time postoperatively as we observe the characteristic formation of stalactite and stalagmite. This could be explained as the simple concept of normal wound healing and the concept of abnormal wound healing by secondary intention healing. Once there is an area of bare bone without vascular tissue or normal mucosa, the body tries to create cicatricial tissue to cover the area of bare bone. If the area of bare bone is large, a large amount and thick scar tissue could be observed (Fig. 3A - 3G).

Fig. 3 Mechanism of failed DCR. 3A) showing post-operative endoscopic DCR with bicanalicular intubation. Nasal mucosa was removed too aggressively. 3B) Initial period of the healing process the cicatricial tissue starts to encroach from the nasal mucosa covering the bare bone gradually. Lacrimal irrigation can be done successfully. The patient has no symptom of epiphora. 3C) Showing the more cicatricial tissue fully grows surrounding the intubated silicone stent. The patient may partially have symptom of epiphora postoperatively even with silicone stent intubation. 3D) Showing after silicone stent removal, the tiny nasal ostium was still patent. The patient may have symptom of epiphora even if lacrimal irrigation could be performed successfully called Sump syndrome. 3E) Showing total occlusion after silicone stent removal. The patient would have epiphora and lacrimal irrigation shows total blockage. 3F and 3G) showing a diagram of the stalagmite and stalactite phenomenon.
Evaluation and the plan with 45 degree test

In my practice for patients with the problem of recurrence epiphora after DCR surgery, lacrimal syringing and irrigation are enough and could provide adequate information for evaluating if there is post lacrimal sac or pre lacrimal sac obstruction. I have routinely not used dacryocystography in my practice because lacrimal syringing per upper or lower punctum for 10 mm or more than 10 mm could represent the patency of the canicular system. In complicated cases, DCGs can reveal ’sump syndrome or ’birdbox’ anastomosis with hold up of dye in the sac on the erect x-ray, which is not identifiable on lacrimal irrigation alone [7]. If the patient has a post distal end of canalicual or post common canalicual obstruction, the revision surgery by endoscopic approach would be recommended. If the patient has significantly more than 3-4 mm canalicual obstruction on both upper and lower canaliculus or total obstruction of canalicual tissue, I would perform conjunctival DCR.

45 degree test is a practical test that could be performed during the initial step of endoscopic revision surgery within a few minutes. By applying the tip of Bowman probe per upper punctum to canaliculus and enter to lacrimal sac at 0 degrees and then rotate the proximal tip of Bowman probe downwardly 45 degrees and apply the tip superomedially, if the tip of Bowman probe could be passed freely and stopped at the septal mucosa, this means the upper 1/3 of the frontal process of maxillary bone is removed adequately. If the tip of the Bowman probe could not be passed through septal mucosa and stopped at the medial wall of the lacrimal sac at 0 degrees and 45 degrees as mentioned technique above, this means a high percentage of upper 1/3 of the frontal process of maxillary bone is not removed adequately (Fig. 4A - 4C). In this condition, the surgeon could have enough information for evaluating if the surgeon needs to enlarge the bony ostium, especially the upper 1/3 of the frontal process of the maxillary bone. Residual thin lacrimal bone could be easily removed during performing revision surgery.

Interpretation of 45 degree test

- 0 degree test is positive means the tip of the Bowman probe could be passed from the common canaliculi through the area of the removed bone at the same level of common canaliculi and then stopped at septal mucosa medially.

- 0 degree test is negative means the tip of the Bowman probe could not be passed from the common canaliculi to the septal mucosa and is stopped at the medial wall of lacrimal mucosa at the same area of common canaliculi. This represents that the previous surgeon did not successfully remove the frontal process of maxillary bone at the level of common canaliculi.

- 45 degree test is positive means the tip of the Bowman probe could be passed from the common canaliculi through the area of the removed bone (upper 1/3 of the frontal process of maxillary bone) and then stopped at septal mucosa medially.

- 45 degree test is negative means the tip of the Bowman prove could not be passed from the common canaliculi to the septal mucosa and is stopped at the medial wall of lacrimal mucosa above the area of the common canaliculi. This represents that the previous surgeon did not remove the upper 1/3 of the frontal process of maxillary bone adequately.
Fig. 45 Degree Test, 4A) Showing the green arrow as a No. 00 Bowman probe was passed from the upper punctum through the upper canaliculus then past common canaliculi at 0 degree, and then the proximal end of the Bowman probe was rotated downwardly 45 degrees showed as a yellow arrow for checking the adequacy of removed bone (upper 1/3 of the frontal process of maxillary bone). 4B) Showing a Bowman probe was applied at 0 degree. 4C) Showing a Bowman probe was applied at 45 degrees.

Surgical Techniques

The key element in endoscopic revision DCR is the precise identification of the location and extent of the lacrimal sac while the surgeon is viewing it from the nose. The surgeon can then accurately resect just those tissues overlying the lumen while avoiding damage to surrounding orbital and nasal tissues. Complete excision of cicatricial tissue is needed. An effective bone removal to complete exposure of lacrimal sac. Finally, complete incision and marsupialization of lacrimal sac mucosa.

Revision endoscopic DCR for Sump syndrome (Failed primary endoscopic DCR)

The lacrimal Sump syndrome (Fig. 3D and 5A) has been recognized as a failed DCR caused by the presence of residual lacrimal sac with too small and too high nasal ostium over or near the area of common canaliculi, thus creating a blind pouch that retains tear and vulnerable to infection [8] or insufficient downward extension of the osteotomy may be related to lacrimal sump syndrome [9]. Epiphora occurs when tears collect in this residual pouch and lacrimal drainage is delayed. Irrigation into the nose may seem normal [10].

The concept of treatment for lacrimal sump syndrome is not difficult, start by making a large osteotomy. Expand osteotomy and resect the lower portion of lacrimal sac flaps and the surrounding nasal mucosa can be done in endoscopic revision surgery. Opening the bottom of the lacrimal sac is considered for primary endoscopic DCR and can reduce the chance of sump syndrome [11]. The available various techniques for enlarging ostium are simply enlarging with contact Nd: YAG laser [10], residual reopening sac with merogel coverage [12], and intranasal flap suturing [13]. Bicanalicular silicone stent intubation is highly recommended for all revision techniques.

For my endoscopic revision of Sump syndrome, start by making the vertical cut extending from the small nasal ostium inferiorly (Fig. 5B). Then the healthy internal lacrimal mucosa could be seen. The posterior flap could be created and rotated posteriorly with the Bowman probe (Fig. 5C). Simple posterior flap suturing with 180 degree 8 mm spatula needle of 6-0 vicryl suture was applied (Fig.
Lacrimal irrigation could be done successfully without any resistance (Fig. 5F).

Fig. 5 Surgical technique for endoscopic revision for Sump syndrome with simple posterior flap suturing. 5A) Sump syndrome 5B) A vertical cut was done with a 15 degree micro-sharp blade inferiorly through the moderate thick scar tissue at the medial wall of the lacrimal sac. 5C) Posterior flap was created and rotated posteriorly with the Bowman probe. 5D) Posterior lacrimal flap suturing was performed trans nasally with the backhand grasping of 180 degree 8 mm spatula needle of 6-0 vicryl suture. 5E) Simple surgical knot was done with 2 hand technique trans nasally for anchoring the posterior flap to the middle turbinate. 5F) Lacrimal irrigation was done successfully and the internal normal lacrimal mucosa was seen clearly.

Revision endoscopic DCR for failed primary external DCR with no nasal ostium, inadequate bony removal, and marked scar tissue on the medial wall of the lacrimal sac.

Understanding the Bony Removal Concept

The most common causes of failed primary external DCR are inadequate bony removal and the inadequate approximation of lacrimal and nasal mucosa. For simple understanding, I would divide the area of the frontal process of maxillary bone related to the whole height of the lacrimal sac to be upper 1/3 and lower 2/3 (Fig. 6A). In this case, showing the previous surgeon removed only the lower 2/3 of the frontal process of the maxillary bone. The limitation of the external or transcutaneous approach is the frontal process of maxillary bone underneath the medial canthal ligament that could not be removed easily (Fig. 6B).

Fig. 6 Demonstrating the bony concept of removed bone. 6A) Showing the area of the frontal process of maxillary bone related to the whole height of the lacrimal sac was divided to be upper 1/3 and lower 2/3 for understanding the concept of bony removal. 6B) Showing the lower 2/3 of the frontal process of maxillary bone was removed by external DCR. The bone underneath the medial canthal ligament (Upper 1/3 of the frontal process...
of maxillary bone) could not be removed easily by the external DCR approach. 6C) Showing the lower 2/3 of the frontal process of maxillary bone was removed and the upper 1/3 of the frontal process of maxillary bone has not been removed by the external DCR approach. The white dot line showed the upper 1/3 of the frontal process of maxillary bone that could be removed easier for the revision case by an endoscopic approach.

Fig. 7 Surgical technique for Revision Endoscopic DCR for failed primary external DCR 7A) Showing tiny nasal ostium on the right lateral nasal wall. 7B) Vertical cut was done for creating a C-shaped flap with the sharp end of the Freer periosteal elevator. 7C) Residual bone of lower 2/3 of the frontal process of maxillary bone was removed with 90 degree 3 mm Kerrison rongeur. 7D) Adequate bony ostium was created and a thick medial wall of the right lacrimal sac was seen. 7E) Vertical cut was done with a 15 degree micro-ophthalmic knife. 7F) Anterior and posterior lacrimal flaps were created successfully.

This case showed the revision for failed external DCR by endoscopic approach. A tiny and tight opening of the nasal ostium with the partial flow of lacrimal irrigation could be observed by lacrimal syringing (Fig. 7A). Intraoperatively, we could check the adequacy of the bony removal by applying the Bowman probe at 0 degrees (Green arrow in Fig. 4A & Fig. 4B) and then rotating downward 45 degrees (Yellow arrow in Fig. 4A & Fig. 4C). Vertical incision through the thick scar tissue of nasal mucosa was done with the sharp edge of the periosteal elevator (Fig. 7B) then the residual bone of the lower 2/3 frontal process of maxillary bone was removed successfully with 90-degree Kerrison Rongeur (Fig. 7C) and the upper 1/3 of the frontal process of maxillary bone was removed with chisel and mallet technique. The whole medial wall of the lacrimal sac was well exposed (Fig. 7D). An l-shaped incision was done on the very thick cicatricial tissue of the medial wall of the lacrimal sac (Fig. 7E). Then the anterior and posterior flap were created (Fig. 7F). The anterior lacrimal flap was rotated anteriorly to approximate with nasal mucosa anteriorly (Fig. 8A). Anterior flap suturing with 180 degree 8 mm spatula needle of 6-0 vicryl suture was done (Fig. 8B). I usually apply 2 stitches for approximation of anterior lacrimal flap and nasal mucosa anteriorly and let the wound heal as the primary intention healing (Fig 8B-8F & Fig. 9A-9B). Too much removal of the nasal mucosa is prohibited because the bare bone area could happen and the chance of cicatricial tissue surrounding the nasal ostium may increase because of secondary intention healing. Posterior flap suturing is not performed in this case because of the very small posterior lacrimal flap was found after the l-shaped incision. 40 mg/ml of Triamcinolone acetate solution was injected into the mucosal junction of approximation between the lacrimal and nasal mucosa (Fig. 9C). Bicanalicular intubation was performed (Fig. 9D) and the knot was tied at the nasal mucosa anteriorly (1 cm posterior to the nostril). In this case, I apply the gel foam between the silicone stent (Fig. 9E) and introduce the gel foam deeply between the anterior and poste-
rior lacrimal flap. Then soak the gel foam with residual 40 mg/ml of Triamcinolone acetate solution (Fig. 9F).

Fig. 8 Surgical technique for Revision Endoscopic DCR for failed primary external DCR 8A) The anterior lacrimal flap was rotated anteriorly with cupped micro ear forceps. 8B-8C) Anterior flap suturing was performed with a 180 degree 8 mm spatula needle of 6-0 vicryl suture. 8D) the second bite of suturing on the nasal mucosa anteriorly was done. 8E) The knot was tied with a simple surgical knot. 8F) Second anterior flap suturing on the lower half of the anterior lacrimal flap was performed with the same needle.

Fig. 9 Surgical technique for revision endoscopic DCR for failed primary external DCR 9A) the Second bite of lower portion of the anterior lacrimal flap suturing was done on nasal mucosa anteriorly. 9B) Lacrimal mucosa was fully marsupialized. Irreg-

ular surface of internal lacrimal mucosa was seen. 9C) 40 mg/ml of triamcinolone acetate was injected into inflamed lacrimal sac mucosa and surrounding nasal mucosa. 9D) Bicanalicular intubation was done. 9E-9F) 2 holes were created on the 1x1 cm² of Gel foam then the silicone stent was inserted inside the 2 holed and the gel foam was introduced deeply and placed in front of the area of common canaliculi for preventing the surrounding mucosal adhesion during the healing process.

Revision Endoscopic DCR for failed multiple DCR with Severe Contracted Ostium at Common Canaliculi

The last case would show how to perform endoscopic revision failed DCR for severe contracted nasal ostium with very thick cicatricial tissue at common canaliculi with inadequate bony removal. This example is one of the most challenging for lacrimal specialists because of the very thick scar tissue and high percent of recurrence of obstruction.

The patient got failed multiple DCRs and there was no nasal ostium could be seen (Fig. 10A). The surgeon starts by applying the Bowman probe downward 45 degrees and the tip of the Bowman probe penetrates from the punctum through the thick scar tissue of the nasal cavity (Fig. 10B). A vertical incision was done by using the sharp end of the periosteal elevator over an area of the frontal process of the maxillary bone, starting 4 mm anterior to the axilla of the middle turbinate (Fig. 10D-10C). The horizontal incision was extended posteriorly at the upper and lower end of the previous vertical incision.
(Fig. 10E-10F). A very thick C-shaped flap was totally removed by using a straight Blakesley forceps (Fig. 11A-11B). Bowman probe was rotated downwardly 45 degrees to evaluate the adequacy of bony removal above the area of common canaliculi (Fig. 11C). A vertical incision was created superiorly (Fig. 11D) and nasal mucosa was dissected to expose the residual bone (Fig. 11E). At this point, the lower 2/3 of the frontal process of maxillary bone has been removed by the previous surgery. Upper 1/3 of the frontal process of maxillary bone was removed with chisel and mallet technique (Fig. 11F, 12A-12B).

Very thick cicatricial tissue was seen over the area of common canaliculi. A horizontal incision was done repetitively with a Sickle knife to create a larger opening at an area of common canaliculi. Bowman probe was inserted through the upper and lower canaliculus to identify the distal end of the upper and lower canaliculus (Fig. 12C). The scar tissue above common canaliculi was rotated superiorly and imitate a pseudo superior flap and was ready for superior flap suturing to the nasal mucosa superiorly (Fig. 12D). The superior flap was sutured with 180-degree 8 mm spatula needle of 6-0 vicryl suture to nasal mucosa superiorly (Fig. 12E-12F). The knot was tied as a simple surgical knot intranasally (Fig. 13A). The superior flap was fixed superiorly for preventing the scar tissue move downwardly which would lead to the recurrence of contracted nasal ostium at common canaliculi (Fig. 13B). The 40 mg/ml of Triamcinolone acetate was injected into scar tissue surrounding common canaliculi and scar tissue of residual lacrimal sac and surrounding nasal mucosa (Fig. 13C). Bicanalicular stent intubation was done (Fig. 13D). 2 small holes were created on 1 cm x 1 cm Gel foam and a silicone stent were intubated inside the gel foam. Finally, gel foam was placed deeply and located at the area of common canaliculi underneath the superior flap (Fig. 13E-13F). This technique expects to prevent the encroaching of scar tissue over the common canaliculi during the post-operative healing process. Regular endoscopic exam during the postoperative follow-up is very important and removing or cleaning any new granulation tissue during the postoperative period is crucial to optimize the success rate of endoscopic revision for failed DCR.

Fig. 10 Revision endoscopic DCR for failed multiple DCRs with severe contracted Ostium at Common Canaliculi. 10A-10B) A Bowman probe was introduced from the right upper punctum through the scar on right lateral nasal wall. 10C-10D) Showing vertical incision was done with sharp end of Freer periosteal elevator. 10E-10F) Showing very thick cicatricial tissue was rotated posteriorly and the horizontal incision was done at the upper and lower end of vertical incision with sharp Steven scissors.
Fig. 11 Revision endoscopic DCR for failed multiple DCRs with severe contracted ostium at common canaliculi. 11A-11B) Showing very thick cicatricial tissue was totally removed by straight Blakeley forceps. 11C) 45 degree test was done to evaluate the adequacy of removed bone (upper 1/3 of the frontal process of maxillary bone). 11D) Vertical incision was extended superiority from the previous first vertical incision to expose the residual upper 1/3 of the frontal process of the maxillary bone. 11F) Showing the upper 1/3 of frontal process of maxillary bone was removed with 4 mm nasal fine bone chisel and mallet. A vertical bite was done first.

Fig. 12 Revision endoscopic DCR for failed multiple DCRs with severe contracted ostium at common canaliculi. 12A-12B) Showing horizontal bite was done accordingly. The piece of upper 1/3 of frontal process of maxillary bone was removed easily. 12C) Very thick cicatricial tissue over the common canaliculi was seen and a horizontal cut was done repetitively with a sickle knife to expose the inner punctum of the distal end of canalicular tissue 12D) Pseudo superior flap was created from the residual scar tissue to imitate as the superior flap. 12E-12F) Superior flap suturing was done to approximate superior flap to the nasal mucosa superiority with 180-degree 8 mm spatula needle of 6-0 vicryl suture.

Fig. 13 Revision endoscopic DCR for failed multiple DCRs with severe contracted ostium at common canaliculi. 13A-13B) Showing superior flap suturing was performed and the knot was tied with 2 hand-technique intranasally. 13C) 40 mg/ml of Triamcinolone acetate was injected into the scar tissue and the surrounding nasal and lacrimal mucosa. 13D) Bicanalicular intubation was done. 13E-13F) 2 holed was created on the 1x1 cm2 of Gel foam then the silicone stent was inserted inside the 2 holed and the gel foam was introduced deeply and placed in front of the area of common canaliculi for preventing the surrounding mucosal adhesion during the healing process.

Septal Deviation and Endoscopic DCR

In the case of marked septal deviation and thick maxillary bone of a big skull, the surgeon may have a difficult time removing the upper 1/3 of the frontal process of the maxillary bone. In my practice, I did not perform septoplasty in deviated septum patients for nasolacrimal duct obstruction patients. I use the Q tip technique (Fig. 14A -14D) for a small degree of septal deviation and the cotton ball technique for marked septal deviation for temporarily enlarging the upper part of the nasal cavity. During endoscopic DCR in marked septal deviation, the surgeon may inevitably damage.
the nasal or septal mucosa that causes temporary abrasion of the nasal or septal mucosa. To prevent the cicatricial tissue between septal and nasal mucosa, I use silastic sheet kept intranasally during the first 1-2 weeks postoperatively for preventing adhesion formation between septal mucosal abrasion and mucosa of new ostium opening (Fig. 15A & 15B).

**Fig. 14 Q tip technique for septal deviation during endoscopic DCR**  
14A) Marked septal deviation was seen on left nasal cavity. 14B) Septal bone was pushed medially for enlarging the nasal cavity on left side. 14C) Tip of Q tip was grasped with Blakeley forceps and placed on the roof of left nasal cavity. 14D) This technique allowed the surgeon to have 3 mm or more space for proceeding the endoscopic DCR in marked septal deviation without septoplasty.

**Fig. 15 Silastic sheet for marked septal deviation during endoscopic DCR**  
15A) Silastic sheet was placed and fixed with 5-0 prolene suture inside the left nasal cavity for 1 week. 15B) Silastic sheet was located inside the left nasal cavity for preventing the adhesion between the septal mucosa and nasal ostium or surrounding nasal mucosa.

**Summary**

Revision for failed DCR is a challenging surgery. The endonasal endoscopic approach has been shown to be a relative safe, reliable option and management of recurrent epiphora after failed DCR [14]. The causes of failed DCR are multifactorial. Careful preoperative and intraoperative evaluation of the patient will allow the surgeon to anticipate the surgical procedures required to create the patent nasal ostium. Clarifying these differences in endoscopic revision will help improve the surgical outcomes of primary surgery involving either external or endoscopic dacryocystorhinostomy [15]. The surgical algorithm presented is very effective in correcting failed DCR and could be used practically. Understanding the anatomy of the lacrimal system, surrounding anatomy and the pathophysiology of this problem, the bony and flap approximation concepts [13] is essential to implement the algorithm properly and keep complications to a minimum.
References

Ptosis Correction with Posterior Approach White-line Levator Advancement
- My Experience

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Abstract

Blepharoptosis is one of the most commonly encountered eyelid disorders in Ophthalmology. As such, ptosis surgery is the bread and butter of an Oculoplastic Surgeon. Ptosis surgery generally falls into 3 categories: Frontalis suspension techniques, Anterior approach repair of the levator complex or Transconjunctival repair of the Müller’s muscle, tarsus, conjunctiva or levator complex. In this article, I describe my experience with the posterior approach white-line levator advancement. The technique, benefits, risks and indications are discussed. The procedure is a promising technique for both cosmetic and functional cases.

Introduction

Ptosis is a common Oculoplastic condition. It causes cosmetic and functional deficit. The term “Ptosis” is derived from the Greek word falling and refers to drooping of the body part (1). Ptosis refers to vertical narrowing of the palpebral fissure secondary to drooping of the upper eyelid to a lower-than-normal position (2). Ptosis must
not be overlooked in the preoperative evaluation of an aesthetic patient (3). There can be a multitude of etiologies for ptosis and it is commonly classified into Aponeurotic, Myogenic, Neurogenic, Mechanical and Traumatic (4). Management is primarily surgical. However, certain etiologies may improve with non-surgical management and treatment of the underlying diseases (5).

Surgical management of ptosis depends on the levator function. In patients with moderate to good levator function, surgical management generally involves the eyelid elevators such as levator aponeurosis and Müller’s muscle. The approaches to access the eyelid elevators include anterior and posterior. In anterior approach ptosis correction, one needs to go through many layers of the eyelid before access to the levator is attained. Posterior approach white-line levator advancement gives a more direct access to the eyelid elevators with minimal dissection. In this approach, the White-line which is the posterior surface of the levator is advanced via a transconjunctival route without resection of the Müller’s muscle and conjunctiva (9). Other posterior approach options are conjunctival mullerectomy but one needs to choose the candidates carefully. The patient needs to have good levator function, mild to moderate ptosis and positive response to phenylephrine test (6). Hence, conjunctival mullerectomy is not as versatile as posterior approach white-line ptosis correction which has a multitude of uses and advantages described below. During my initial years of ptosis corrections, I adopted the anterior approach levator advancement and posterior approach conjunctival mullerectomy. In the recent past, I have started to perform posterior approach white-line levator advancement. Posterior approach white-line levator advancement has now become my preferred technique due to its multiple uses, ease of performance and predictable outcome.

**Candidate**

Patient with ptosis with moderate to good levator function irrespective of the response to phenylephrine test (7). Patients with severe involutorial ptosis also benefit from this procedure (8). However, a phenylephrine test needs to be performed in the ptotic eyelid to look for contralateral droop in case of unilateral ptosis (11). Positive phenylephrine test is also good indicator for success for posterior approach white-line levator advancement. A detailed examination including eyelid measurements and provocative testing is important in determining the aesthetic and functional potential of eyelid ptosis repair with or without blepharoplasty (3).
Patients with risks of scarring and keloid benefit from white-line posterior approach levator advancement as there is no skin incision. The technique can also be performed in children with ptosis and moderate to good levator function. It is relatively easily performed under general anaesthesia as the surgeon only needs to identify the white-line and advance it unlike anterior approach ptosis correction wherein levator muscle is arbitrarily advanced using measurements based on levator function. It can also be performed with upper eyelid blepharoplasty in patients with dermatochalasis and ptosis. It is also a good option for patients with sunken sulcus with mild ptosis. As the levator is advanced through the white-line posterior approach, the pre-aponeurotic fat pads are restored anteriorly to the anatomical position giving the upper eyelid a youthful and fuller appearance. Young patients with mild ptosis causing lid crease asymmetries who want a no-scar and minimally invasive procedure are good candidates. The technique is also suitable in elderly patients with multiple co-morbidities who want a minimally invasive and quick fix for their visually significant ptosis.

Procedure is generally avoided in patients with poor levator function, superior trabeculectomies and severe dry eyes.

Procedure

The patient’s lid crease is marked as that would be the entry and exit point for the sutures. In unilateral ptosis, one has to match with the lid crease of the contralateral side. 1ml of Local anaesthesia is injected into the skin. The eyelid is everted and 1ml of local anaesthesia is injected into the palpebral conjunctiva. Lid margin traction suture with 4.0 Silk is placed to evert the eyelid for surgery. Gentle cautery is applied to the conjunctiva over superior border of the tarsal plate to create a raw area for the conjunctiva to adhere and appose. Incision is made over the palpebral conjunctiva 1mm superior to the superior border of the tarsal plate. Conjunctiva and Müller’s muscle composite flap is raised (9). Dissection is carried out posteriorly until the white line is identified. Two 5.0 Vicryl sutures (one at the medial border of the pupil and another 2 to 3mm lateral to it) are used to advance the white-line through the anterior surface of the superior border of the tarsal plate and out through the skin. Temporary knots are placed and if the lid height and position are satisfactory, the knots are tied and cut. In case adjuvant blepharoplasty is performed, the sutures are tied over the soft tissue overlying the anterior surface of the tarsal plate and the sutures are never exposed (9). Post operatively patient is given steroid and antibiotic combined eye ointment to be used inside the eye and over the sutures.

Complications that can be encountered

Patient is advised to come for follow up the next day. Rarely, patients can have corneal abrasion and corneal irritation. A bandage contact lens may be needed for a few days until abrasion heals. As the Vicryl sutures are dissolving during the post-surgical period, there can be an inflammatory response that generally settles within a week or two and reassurance is needed. Initially there can
be some eyelid contour defects due to the Vicryl sutures being too tight and distorting the tarsal plate which resolves spontaneously. Posterior approach outcomes are predictable and overcorrection rarely happens. In the rare event that overcorrection happens, the Vicryl sutures over the skin can be released early and the eyelid everted and levator released until lid height is satisfactory.

The posterior white line approach technique is easy to teach and learn. The anatomy is easily identifiable, there is minimal dissection and unlike the anterior approach, there is little chance of losing anatomical bearings (9). Posterior approach blepharoptosis surgery, via the transconjunctival route, was probably one of the first methods employed to shorten the levator muscle (10). Posterior approach white-line advancement procedure is fast, gives quick recovery, is scar-free and highly suitable to the above group of aesthetically demanding patients. In my experience, it has good predictability in terms of contour, symmetry and excellent success rate. It has advantages over other

**Discussion**

With the advent of social media, rampant photography and selfie culture, there is an increased demand for minimally invasive surgeries for correction of small asymmetries resulting from ptosis. Masking associated with the Covid 19 pandemic and increased emphasis on the eyes, have also added to the demand especially among the younger generation.
posterior approach ptosis correction such as conjunctival mullerectomy. It can be used in patients with negative phenylephrine test and in patients with moderate levator function. It can also be used in cases of severe involutional ptosis. Posterior approach ptosis correction not only corrects the ptosis but restores the natural lid crease, corrects hollow sulcus without any skin incision. As such it is a highly desirable procedure among East Asians.

**Conclusion**

Posterior approach White-line ptosis correction is a versatile procedure and has a multitude of uses. It can be used for varying degrees of ptosis (mild, moderate and severe) as long as the levator function is moderate to good. There is no skin incision and it is a minimally invasive procedure. The procedure is quick with short recovery period. Additionally, it can be combined with another procedure with a different pathology (11) Outcomes are predictable and there is an excellent success rate. It is highly suitable for mild cosmetic ptosis with sunken sulcus or ptosis associated with asymmetries in the lid crease. As such, it is vital for a ptosis surgeon to have this approach in their repertoire of surgeries for ptosis correction.

**Fig 7:** Pre-op left ptosis with sunken sulcus and observe the post surgery picture - after left upper eyelid ptosis correction

**Fig 8:** Bilateral ptosis with left sunken sulcus – before and after bilateral surgery.

**Fig 9:** Before and after traumatic Right levator disinsertion repair.
References


6) Ng DS, Chan E, Ko ST. Minimal incision posterior approach levator plication for aponeurotic ptosis. Eye 2015; 29(4): 483-491


Retained intra-orbital foreign body causing orbital apex syndrome: A diagnostic and surgical challenge

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Introduction

Retained intra-orbital foreign bodies (FB) are challenging to manage. Organic or wooden FB are especially difficult to detect clinically as well as on imaging. Periocular lacerations which seem small on initial examination may serve as entry point for comparatively large FB. Retained intra-orbital FB often go unnoticed in such patients and can have a delayed presentation as orbital cellulitis, abscess, fistula and osteomyelitis. The following case report highlights one such patient presenting as orbital cellulitis with orbital apex syndrome.

Case summary

A young adult male presented to the Oculoplasty clinic 1 week after trauma to left eye with a branch while gardening. On consulting at a local hospital, a protruding piece of the branch was removed from the lower eyelid wound and sutured. After about 4 days he noticed a drop in vision and inability to move the left eye. Examination at presentation showed eyelid edema with oozing pus from the sutured laceration. Complete ptosis with upper eyelid edema, proptosis, eyeball in hypodeviation with absent extraocular movements were noted (Fig 1A). Visual acuity was no perception of light in the left eye. Pupil was dilated and non-reactive. Fundus examination was normal. Corneal sensations were absent. Visual acuity was 20/20 in the right eye with normal slit lamp examination.

Based on the history and clinical examination, the differential diagnoses included orbital cellulitis secondary to retained intra-orbital FB, Orbital apex syndrome and cavernous sinus thrombosis. Orbital imaging was requested. Computed tomography (CT) showed a hypodense cylindrical structure in...
the inferior orbit along the floor up to mid orbit, in close proximity with the inferior rectus suggestive of likely FB with surrounding inflammation (Fig. 1B, C). A well-defined hyperdense mildly contrast enhancing ovoid area at the apex around the optic nerve suggestive of hematoma was noted causing the orbital apex syndrome (Fig. 1D).

At 11th post-operative day there was reduction in the swelling with return of corneal sensation but no expected improvement in ocular motility. A repeat imaging revealed a retained IOFB within the substance of inferior rectus (extreme posterior belly) extending up to the orbital apex (Fig. 2B).

Left eye wound exploration with removal of retained FB from original laceration was performed under general anesthesia (GA). A 1.4 cm long wooden FB was removed. Microbiological examination of pus and scraping from the surrounding tissue showed Acinetobacter. Interestingly, KOH mount and calcofluor were suggestive of microsporidia. The histopathology however showed no evidence of microsporidia. Intravenous steroids were initiated under antibiotic coverage for the apical hematoma.

Left eye Orbitotomy and exploration was performed under GA via the previous surgical incision (Fig. 3A). The periosteum along the orbital floor was reflected and small nick made posteriorly with caution. Pus oozed out. Further careful dissection was carried out and a 1.9 x 0.7 x 0.5 cm impacted wooden FB was removed from the apex (Fig. 3B). Thorough betadine and saline wash were given. Post-operative systemic steroids were given.

Figure 2: A: CT image (axial section) at first presentation showing the apical hematoma and inflammation obscuring the FB in the left orbit; B: CT image taken about 11 days post the first surgery showing an impacted FB at the apex.

Figure 3: A: Intra-operative image showing the access to the orbit via extension of the original laceration followed by reflecting the periosteum up to the apex. B: The removed wooden FB, measuring 1.9 x 0.7 x 0.5 cm (inset).
On follow up at 8 months post-surgery, there was complete resolution of proptosis and ptosis with significant improvement in ocular motility (Fig.4B). The eye was slightly hypodeviated with limited elevation probably due to fibrosis of inferior rectus. The vision remained no perception of light due to optic neuropathy.

Discussion

Orbital apex syndrome is a rare presentation of retained intra-orbital foreign body. It is characterized by involvement of cranial nerves II, III, IV and VI along with 1st branch of Vth cranial nerve. Impacted pen, pellet, metal piece at the apex have been reported. Removal of IOFB from the apical area warrants a thorough pre-operative risk-benefit assessment owing to the possible damage to crucial structures. Inert FB can be observed but organic FB needs to be removed due to risk of infection and abscess.

Wooden IOFB in the apex poses a diagnostic and a surgical challenge. The density of wood on CT imaging is close to fat and air due to which they often go unrecognized. In the present case, specific history of trauma while gardening, high rate of suspicion aided in identifying the peculiar cylindrical hypodense structure in the inferior orbit on CT as a retained wooden FB. The apical FB was missed in the initial CT imaging due to obscuring apical hematoma and abscess. The apical IOFB was revealed in the subsequent CT after partial resolution of the surrounding hematoma and abscess. Also, wood tends to become hyperdense on CT with time thus making it visible easily in long standing cases. Serial CT imaging proved helpful in this case.

Though there was nil visual prognosis, it was imperative to remove the IOFB to avoid life threatening complications such as cavernous sinus thrombosis, meningitis and brain abscess.

Depending on the location of the retained IOFB, endoscopic approach, trans-cranial approach, navigation assisted trans-orbital approaches have been described. In the present case, trans-cranial approach was not necessary as the FB was localized to the orbit. It was located near the posterior belly of inferior rectus and a little laterally at the apex hence was not approached via endoscopic route. Dissection in a narrow space up to the apex was challenging in this case. Intra-operatively an abscess surrounding the apical FB was also noted which was drained and the wooden FB removed successfully.

Conclusion

Non-resolving orbital cellulitis in a case of repaired periorbital trauma should raise the suspicion of retained intra-orbital FB. Orbital apex syndrome is a rare clinical presentation. Retained wooden FB missed on initial imaging can be picked up on serial imaging and its removal is crucial to prevent life threatening complications.
References


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Excessive bleeding during DCR surgery – a nightmare!

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Acryocystorhinostomy (DCR) is one of the most commonly performed oculoplastic surgery all over the world where the lacrimal sac as the middle compartment is eliminated to turn the 3-compartment of lacrimal drainage system into 2-compartment i.e., creation of a direct fistula between the tear lake and the nasal cavity.[1] This is performed either by external skin incision (external) or through the nose (endonasal).

Ever since Addeo Toti described the DCR surgery in 1904, DCR surgery has advanced by leaps and bounds to endonasal endoscopic DCR and trans-canalicular laser assisted DCR surgery. However, external DCR surgery still remains the gold standard due to the high success rates of 85%-95% and less sophisticated instrumentation.[2,3]

Every ophthalmology resident and certainly an oculoplastic fellow undergoes a training period of external DCR where he/she must have undergone some terrible experiences due to excessive intraoperative bleeding. A surgeon finds the DCR surgery terribly difficult to continue when there is profuse bleeding. Another condition can be improperly given or failed local anesthesia (LA) resulting in the severe pain during surgery. This triggers a vicious cycle i.e., inadequate block causes pain, resulting in high BP and increased bleeding from bleeders/mucosa and also poor nasal packing may result in impending disaster – a nightmare of DCR surgeon! Other most important difficulties such as inability to properly create an osteotome or flaps have a significant role in the outcome of the surgery, the operation can still proceed in a modified manner such as a Toti surgery with Tube.

In this article, we would like to describe one of the most common causes of an external DCR turning into an ordeal – uncontrolled excessive intraoperative bleeding and share some tips to avoid or manage the nightmare.

Causes of Intraoperative bleeding during DCR surgery:

Intraoperative bleeding is usually due to the faulty surgical technique and intraoperative complications like trauma to the angular vein, angular artery, orbicularis oculi muscle, sac or mucosa, and are generally well manageable.

How to overcome and avoid them?

1. Proper preoperative assessment and patient preparation:
   - Anticoagulants, antiplatelets, NSAIDs tends to increase bleeding intraoperatively. Thus, these medications should be stopped at least 5 days prior to surgery.
• Preoperative investigations - Blood count including hemoglobin level, Bleeding Time, Clotting Time, Prothrombin time, etc. to rule out any bleeding disorders.
• Patients with acute or subacute inflammation should not be operated.
• Rule out potential source of intraoperative bleedings like nasal polyp or nasal masses.
• Preoperative Oxymetazoline nasal drops helps in controlling intraoperative bleeding.
• Good nasal packing preoperatively works wonders.

2. Intraoperative measures:

A. Pain management
It can be achieved through good local anesthesia. Important points that should be considered for a good pain management are:

• Knowledge of where to infiltrate and which nerves are to be blocked (Infratrochlear nerve, Infraorbital nerve branch, anterior ethmoidal nerve branches, locally - skin, muscle, perios- teum, around the sac area) and proper implementation of the block techniques (Figure 1).
• Reducing pain during LA injection makes a patient relaxed and further steps are eased. It can be done by proper counselling, verbal distraction, smaller needle, very slow infiltration, smallest amount and warming infiltrate to room temperature, add injections from blocked site and wound edges.

B. Bleeding during DCR surgery and its management:
General intraoperative measures to reduce bleeding includes:
• Good control of hypertension and proper sedation to prevent the vicious cycle of pain and bleeding.
• Hypotensive anesthesia to reduce bleeding if the patient is being operated on GA.
• Reverse Trendelenburg positioning.
• Lignocaine with adrenaline should be used for local infiltration which prevents bleeding.
• Correct placement of incision to prevent dorsal nasal artery and angular vein injury.
• Proper wound retraction with Cats paw retractor or ligation / cauterization of any bleeders minimizes the intraoperative bleeding.
• Use of suction and repeat nasal pack if required.

Bleeders during DCR surgery:

A study by Gupta et al in 2015 reported bleeding from the nasal mucosa to be the most common cause of troublesome intraoperative bleeding (76.1%) [4].

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Source of Bleeding</th>
<th>No. of eyes</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bleeding from Nasal mucosa</td>
<td>447</td>
<td>76.1</td>
</tr>
<tr>
<td>2.</td>
<td>Bleeding from angular vein</td>
<td>80</td>
<td>13.6</td>
</tr>
<tr>
<td>3.</td>
<td>Bleeding from bones</td>
<td>35</td>
<td>6</td>
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<tr>
<td>4.</td>
<td>Bleeding from muscles</td>
<td>25</td>
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<tr>
<td>5.</td>
<td>Bleeding from systemic and hematologic disorder</td>
<td>0</td>
<td>0</td>
</tr>
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Table 1. Bleeders during DCR surgery [4]
Specific management:

1. Bleeding from Orbicularis oculi muscle:
   • Blunt dissection of the orbicularis oculi muscle and compression with Cats paw retractor or cauterization

2. Bleeding from the Angular vein/ accessory angular vein:
   • Ligation/ cauterization/compression with Cats Paw retractor

3. Bleeding from the bone:
   • Bone wax/ cautery for bleeding from the Sutura notha or osteotomy edges.

4. Bleeding from venous plexus between lacrimal sac fascia and sac mucosa:
   • Compression with gauze/ cautery

5. Bleeding from Nasal mucosa:
   It is the most common cause of a bloody DCR. The causes are inadequate nasal packing, mucosal injury during bone punch, High systemic blood pressure, injury to septal mucosa, etc.

   Management:
   • Check nasal pack - Preoperative good nasal packing is a must, replace packing and advance the nasal pack more superiorly if needed.

   • ABGEL/SURGICEL can be used preoperative or as a replacement which is very effective although expensive.
   • Intramucosal adrenaline + lignocaine infiltration till blanching.
   • Adrenaline-soaked gauze with pressure.
   • Take care to damage the septal mucosa during nasal mucosal incision. If suspicious (usually in case of poor packing/ deviated nasal septum), don’t penetrate deep during flap creation. Bilateral nasal packing can be done if required.
   • Radiofrequency cautery while creating mucosal flaps.

3. Post operative measures

   • Counselling and specific instructions (head end elevation, avoid blowing of the nose) to be given to the patients.
   • Pressure padding/ bandaging of the wound
   • Intravenous Injection Tranexemic acid to help reduce post operative bleeding
   • Monitoring blood pressure – consider lowering BP if high
   • Changing the nasal pack if soaked
   • In pediatric cases – blood loss may require fluid replacement.

In a nutshell – If there is a bloody DCR:

   • Recheck nasal pack and reapply
   • Apply Adrenaline soaked cottonoid pack or gauze with pressure
   • Suction from wound site/ nostril
   • Complete surgery rapidly with lacrimal intubation, Close muscles tightly followed by pressure pad
   • IV Tranexemic acid TDS for 3 days
   • Flush with NS after DCR (in every DCR; more so in a bloody DCR) so as to prevent fibrosis due to clot lysis of the blood clots in the drainage pathway
   • Bicanalicular lacrimal intubation
Fig 1: Nerves to be blocked in DCR surgery

References


A multi-disciplinary treatment of extreme proptosis caused by a recurrent meningioma

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Abstract

Meningiomas are the most common primary tumors of the central nervous system and are more common in female patients. Most meningiomas are benign, but the tumor infiltration can often lead to recurrence. We report a case of recurrent meningioma at the skull base in a juvenile, involving multiple sites including cranial and facial tissue, the prognosis is good after complete surgical resection.

Introduction

Meningiomas originate from the meningeal covering of the central nervous system and are the most common primary tumor of the central nervous system with an annual incidence of about 5 per 100,000 people. Meningiomas are usually benign and rarely have malignant manifestations¹². Meningiomas are more common in women (sex ratio 2:4:1) and the incidence increases with age³. Its clinical manifestations vary depending on the site of involvement and the degree of tumor infiltration. Surgery and radiotherapy are currently accepted first-line treatments, but combined treatment of tumors should also be considered in refractory cases².

Case Report

A 16-year-old girl presented to us because of a huge tumor on the face for 8 years and decreased visual acuity in both eyes for 2 years. The
The patient had a history of nasal cranial communication tumor resections twice 10 years ago, and the postoperative pathological diagnosis was meningioma.

Ocular examination showed the tumor size was about 10*10cm, with granular hyperplasia on the surface, accompanied by increased hair and pigmentation; The tumor is located in the middle of the face and the entire alar of the nose is completely destroyed; light perception was exist only in the left eye; proptosis cannot be measured due to the huge tumor size; eye movement are severely restricted in all directions in both sides; the inferior bulbar conjunctiva of both eyes is highly edematous and prolapsed outside the palpebral fissure; the corneal epithelium has a large defect area and the stromal layer is infiltrated in both eyes; the anterior chamber is normal and bilateral pupil diameter were about 5-6 mm with RAPD+ and fundus details were blurred in both sides.

CT and MRI showed that the tumor involved the anterior skull base, sphenoid and the ethmoid sinus, and invaded the inferior orbital wall, the pressure on the tumor caused the protrusion of the eyeball, and the optic nerve was pulled into a straight line.

The patient was a child with low body weight; the huge recurrent tumor has a wide range of involvement; the tumor has a rich blood supply, and the risk of anesthesia caused by intraoperative hemorrhage is high; it is difficult to determine whether the eyeball can be retracted after tumor resection; if the tumor can be completely removed, then how to reconstruct the huge defect area was faced by the surgeon.

The surgical approach for this patient was designed by a multidisciplinary consultation: the otolaryngologist removed the main tumor in the middle of the face and the nose, the orbital surgeon removed the orbital-infiltrating part, loosened its adhesions, and retracted the eyeball and bulbar conjunctiva into the orbit, then palpebral fissure was sutured. The neurosurgeon continued to remove the basicranial tumor. The defect area was reconstructed with a 3D-printed titanium mesh,
Discussion

Meningiomas are often diagnosed due to neurological symptoms (neurological deficits, seizures, increased intracranial pressure) or tinnitus or headache. Magnetic resonance imaging (MRI) is often used to make an initial diagnosis and to precisely locate and measure tumor size. The currently identified risk factors associated with meningioma development are radiation therapy and hormone intake (cyproterone acetate), and both have a dose-response relationship. Studies show that stopping hormone therapy intake even reduces tumor size.4-6

According to the 2000/2007/2016 WHO classification of meningiomas into 15 subtypes and various invasive criteria (mitotic, necrotic, cellular aspect) based on their histological appearance, Overall, more than 80% are grade I benign tumors while atypical grade II includes 4-15% of meningiomas, and malignant grade III accounts for 1-3%.8 While histological classification is currently the gold standard for the diagnosis and treatment of meningioma, there is still much debate about its relevance. Tumors are very heterogeneous within each grade, moreover, some diagnostic criteria are vaguely defined and subject to a high interobserver bias9-11. The 5-year survival rate is 70% for benign meningiomas and 55% for malignant meningiomas12, and prognostic factors include age, male gender, low Karnofsky performance status, high grade, high mitotic rate, subtotal surgical resection, and optic nerve involvement13-16.

The classic first-line treatment for all meningiomas is surgery. However, a wait-and-see strategy is acceptable when the clinical situation permits, but requires regular observation of tumor changes. Symptomatic treatments including oral or intravenous steroids help temporarily relieve symptoms by reducing peripheral edema. Complete tumor resection is not always achieved intraoperatively due to tumor location and invasion of surrounding tissues.
ing structures and brain parenchyma. Radiation therapy has become the first-line option for skull base lesions encasing vascular nerve structures such as the optic nerve sheath or cavernous sinus. If surgery is not feasible, radiation therapy may be provided alone. Grade I meningiomas are usually treated with surgery or radiosurgery only, with adjuvant radiation therapy used to treat tumor remnants. The 5-year recurrence rates of grade II and III meningiomas are as high as 30-40% and 50-80%, respectively, adjuvant radiation therapy to the tumor area is also recommended along with gross resection. Side effects of radiotherapy and radiosurgery are usually mild but there is also evidence that radiation increases the risk of malignant transformation.

Long-term follow-up studies have shown that even in so-called completely resected tumors, up to 60% of tumors may recur after 15 years. Various pharmacological treatment regimens have been tried, but none have been proven to be effective. Attempts at targeted therapy (anti-angiogenic molecules such as sunitinib or bevacizumab, immunotherapy or FAK inhibitors) depending on the molecular characteristics of the tumor may lead to new therapeutic directions.

**Conclusion**

Meningioma is the most common neurological tumor, and its treatment options and prognosis vary greatly according to different pathological features, and complete surgical resection can reduce the probability of its recurrence. A personalized treatment plan based on the patient’s clinical presentation, imaging, and pathological features should be recommended.

**References**


