



Introduction

Pterygium is a wing-shaped, fibrovascular growth of conjunctiva that advances onto the cornea. The current speculation is that pterygia result from failure of the limbal stem cell barrier caused by environmental and genetic factors. The goals of pterygium surgery are to remove the pterygium and avoid possible complications, most notably recurrence. Numerous techniques have been described including bare sclera excision with and without adjunct therapies like beta irradiation, thiotepa eye drops, intra- or postoperative mitomycin C, amniotic membrane transplantation, and limbal-conjunctival autograft. These adjuvant therapies have reduced the number of recurrences but not completely eliminated the issue. Recurrent pterygia are usually associated with subconjunctival fibrosis, corneal thinning, corneal scarring, dellen formation, cyst formation, granulomas, and in rare cases symblepharon formation and corneo-scleral necrosis. Recurrence-free surgeries for pterygium continues to present a challenge and our study aims to evaluate if the use of certain surgical techniques for primary pterygium excision are associated with a higher incidence of complications, with a special interest in symblepharon formation.

Methods

- An IRB approved study that included a retrospective chart review of all patients from 1/1/2015 - 12/31/2015 with a diagnosis of pterygium (ICD-9 372.xx; ICD-10 H11.xx) seen at Parkland Memorial Hospital. We looked at 362 primary pterygium excisions from 280 patients.
- Of these, only patients who had a complete record of all their surgical care for the pterygium at Parkland Memorial Hospital and had at least 3 months of post-operative follow-up were included in the study.
- Patients were excluded if the primary pterygium excision was completed in conjunction with other procedures such as penetrating keratoplasty and cryotherapy for suspected neoplasia.
- Information on laterality of pterygium, post-graduate year of primary surgeon, surgical technique for excision including use of mitomycin-C (MMC), and post-operative complications were collected. All surgeries were performed by ophthalmology trainees, either residents or fellows.
- We hypothesized the use of mitomycin-C during surgical excision was associated with the formation of symblepharon and tended to have a higher rate of complication.
- Chi-square and Fisher's exact test were used to analyze all the categorical variables.

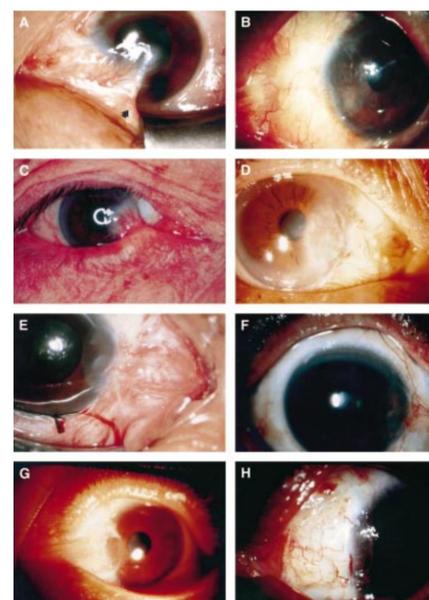
Results

Table 1: Characteristics of patients and the excisional surgery

| Demographic/Risk Factor | No complication (N=230) | Complication (N=132) | P value |
|------------------------------------|-----------------------------|---------------------------|-----------|
| Male (%) / Female (%) | 102 (44.35%) / 128 (55.65%) | 58 (43.94%) / 74 (56.06%) | P = 1.000 |
| Hispanic (%) / Other Races (%) | 200 (86.96%) / 30 (13.04%) | 124 (93.94%) / 8 (6.06%) | P = 0.198 |
| Surgeon Level (Post-Graduate Year) | 2.42 | 2.42 | P = 0.932 |

Table 2: Analysis of surgical technique and complications

| | No Complication | Complication | Total |
|-------------------------|-----------------|--------------|-------|
| Bare Sclera + MMC | 123 (61.8%) | 76 (38.2%) | 199 |
| Simple Closure + MMC | 14 (48.3%) | 15 (51.7%) | 29 |
| Conj Autograft + MMC | 11 (84.6%) | 2 (15.4%) | 13 |
| Amniotic Membrane + MMC | 22 (47.8%) | 24 (52.2%) | 46 |
| Conj Autograft | 41 (75.9%) | 13 (24.1%) | 54 |
| Amniotic Membrane | 19 (90.5%) | 2 (9.5%) | 21 |



From Shimazaki et al. 1998.
 (A) Case 1. Preoperatively, severe symblepharon is seen with dislocated inferior punctum (arrow). (B) Postoperatively, symblepharon is lysed almost completely with clear central cornea.
 (C) Case 2. Preoperatively, stalk-shaped symblepharon is formed. (D) Postoperatively, symblepharon is lysed without pterygium recurrence.
 (E) Case 3. Severe subconjunctival fibrosis recognized at nasal region. (F) Postoperatively, there is a flat nasal conjunctiva without fibrous tissue regrowth.
 (G) Case 4. Preoperatively, massive fibrosis formed around medial muscle. (H) Postoperatively, the adhesion between medial muscle and canthus is lysed with some subconjunctival fibrosis.

Results and Discussion

- A comparison of surgeries involving the use of MMC versus those that did not use MMC was statistically significant. Chi-square analysis revealed a statistical difference between surgical approach and development of a complication ($p = 0.0009$).
- A post-hoc analysis of the Chi-square revealed a statistically significant association between the use of amniotic membrane tissue and intraoperative mitomycin C with the development of post-operative complications.
- The post-hoc analysis also revealed that a lower number of complications were seen with the use of both amniotic membrane tissue and conjunctival autograft transplantation without MMC.

Conclusion

- This retrospective study revealed that at a major county hospital where ophthalmology trainees are the primary surgeons that the use of intraoperative MMC was generally associated with a higher rate of complications in comparison to techniques that did not involve its use.
- The series of symblepharon formation after pterygium excision also revealed that nasal pterygia were found to develop symblepharons if their surgical excision included the use of amniotic membrane tissue and MMC.
- The series also demonstrated that multiple surgeries were poorly associated with the resolution of symblepharons.
- The overall study findings suggest that a decrease in the use of intraoperative MMC should lead to a decrease in complications requiring additional intervention.

Future Direction

- Analyze pterygium excisions at John Peter Smith Hospital - a county hospital whose population demographics are similar to Parkland Memorial Hospital, but where no pterygium excision involves the use of MMC.
- A comparison of the pterygium excision surgeries between both hospitals would provide more data on the role MMC plays in the development of post-operative complications.

References

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