

## Background

- Recreational activities and sports account for thousands of eye injuries each year, with **90%** of sports-related ocular injuries considered **preventable**.<sup>1</sup>
- While golf-related ocular injuries (GROIs) are relatively uncommon, accounting for 1.5-5.6% of sports-related ocular traumas, these injuries can have **devastating and vision threatening** consequences.<sup>2</sup>
- GROIs are often related to the blunt trauma caused by a direct blow from golf balls. Injuries from golf clubs, carts, and foreign bodies have also been documented.
- It has been suggested that wearing eyeglasses or sunglasses may absorb some of the golf ball's energy and reduce impact force, protecting against rupture and open globe injuries, however, these glasses may also increase risk of laceration due to shattering lenses.<sup>2,3,4</sup>

## Objectives

### Primary Objective:

- To describe the visual outcomes associated with golf-related ocular injuries.

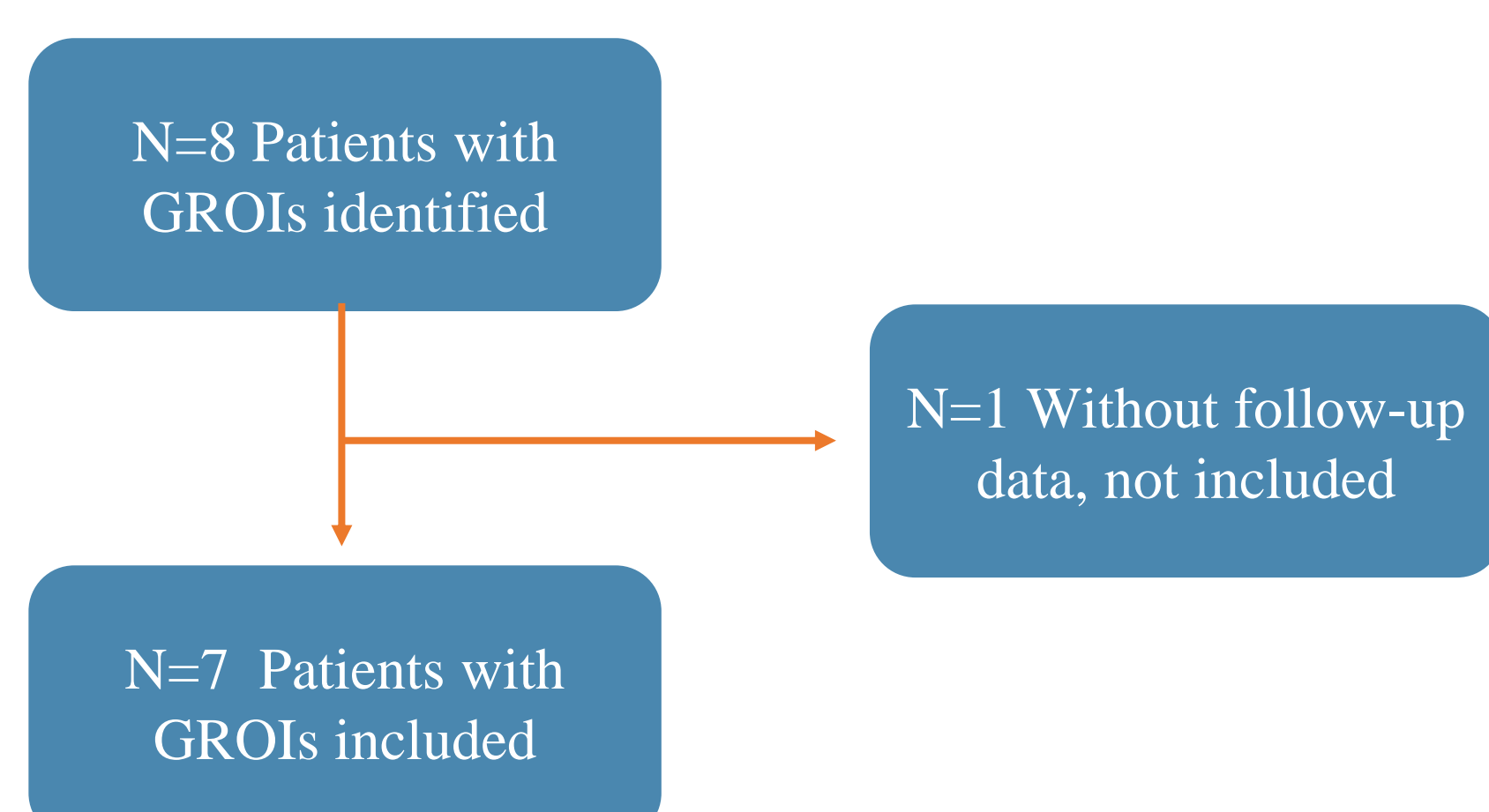
### Secondary Objectives:

- To describe anatomic findings and outcomes.
- To describe the mechanism of injury.
- To describe the medical and surgical management.
- To describe the complications.
- To describe and provide recommendations that reinforce the importance of safety, prevention and the **PROTECT** (Prevention of Recreational Ocular Trauma by Educating the Community Together) Initiative.

## Methods

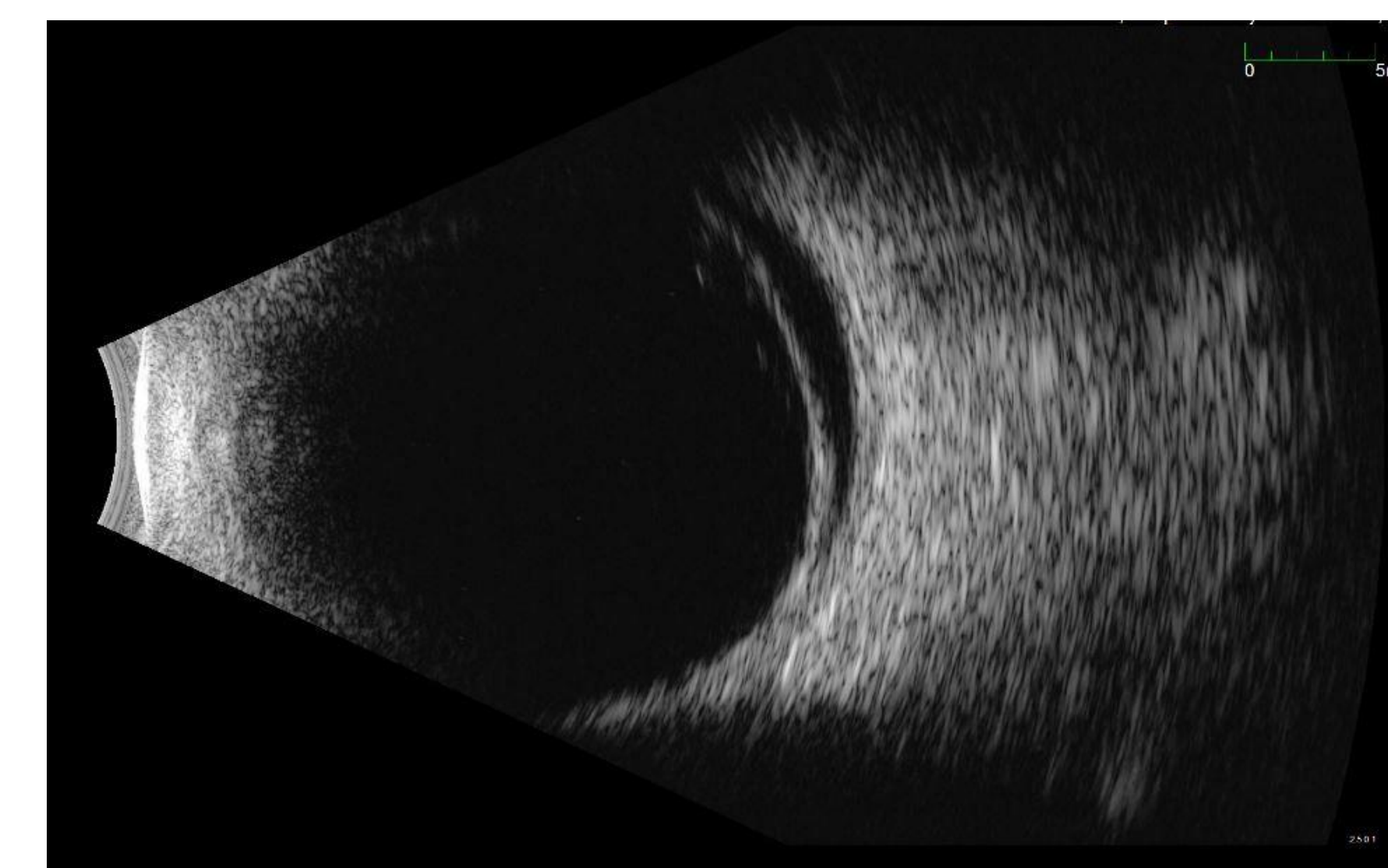
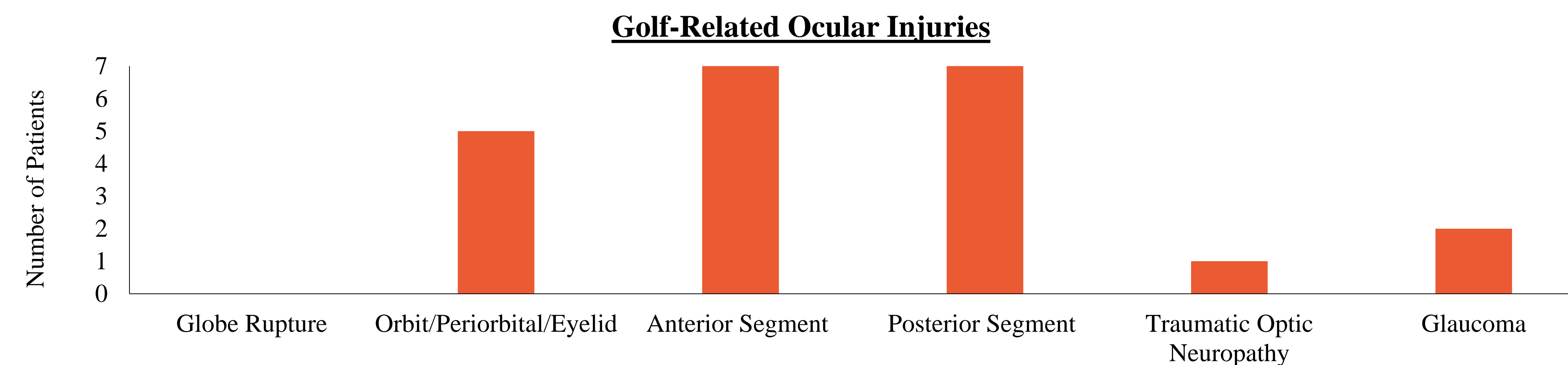
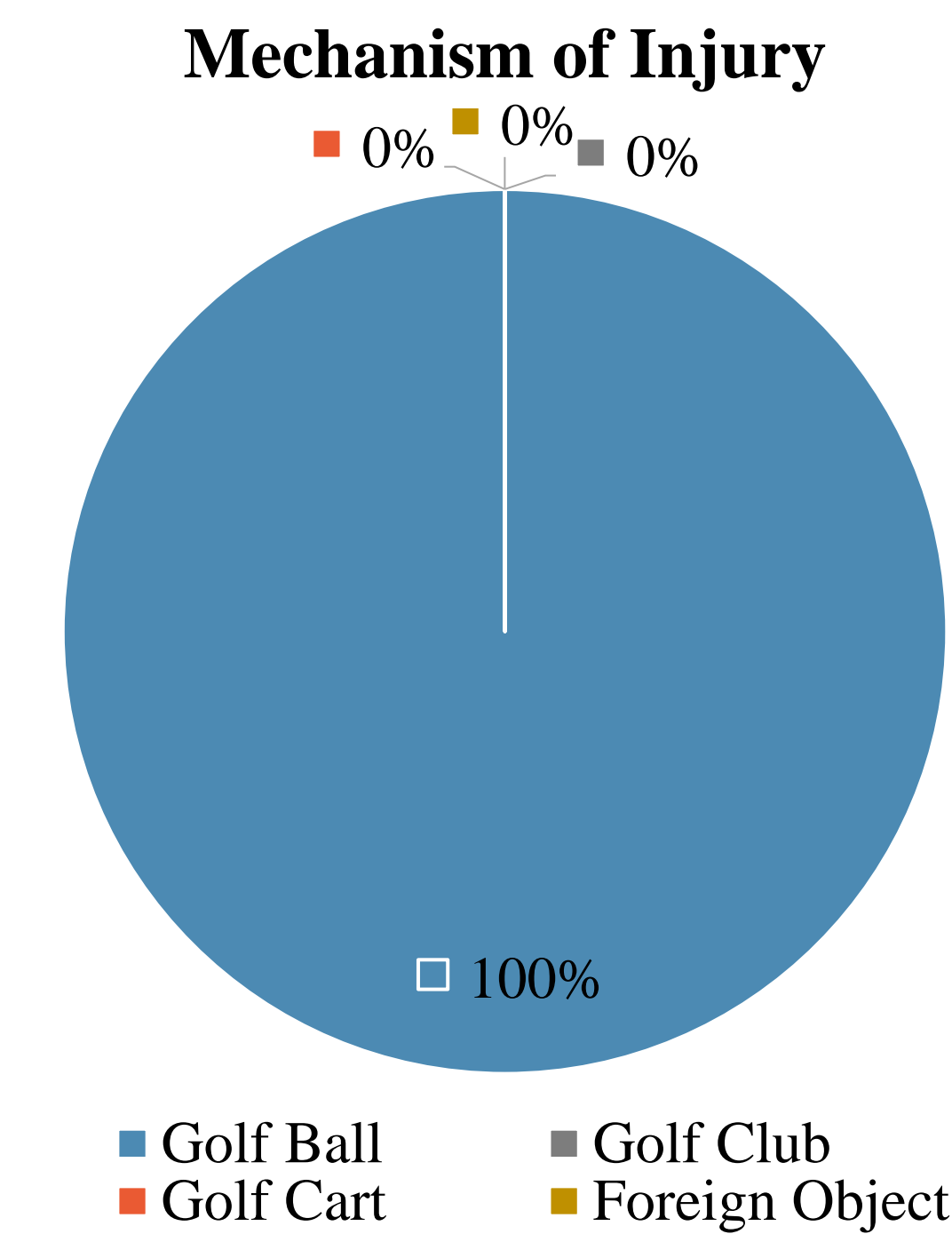
- A **retrospective review** of electronic health records at Calgary Retina Consultants from 2000 to present was performed and included all GROIs (golf ball, club, cart, and foreign body).
- Search terms** included “golf”, “trauma”, “blunt trauma”, “ruptured globe”, “cart”, “golf ball”.
- Inclusion criteria:**
  - All patients, pediatric and adult, that were referred to Calgary Retina Consultants, Southern Alberta Eye Centre for examination and management of GROIs.
- Exclusion criteria:**
  - Patients who do not meet inclusion criteria.
  - Patients who sustained injuries not related to golfing.
  - Patients without any follow-up data.

## Results



## Results Continued

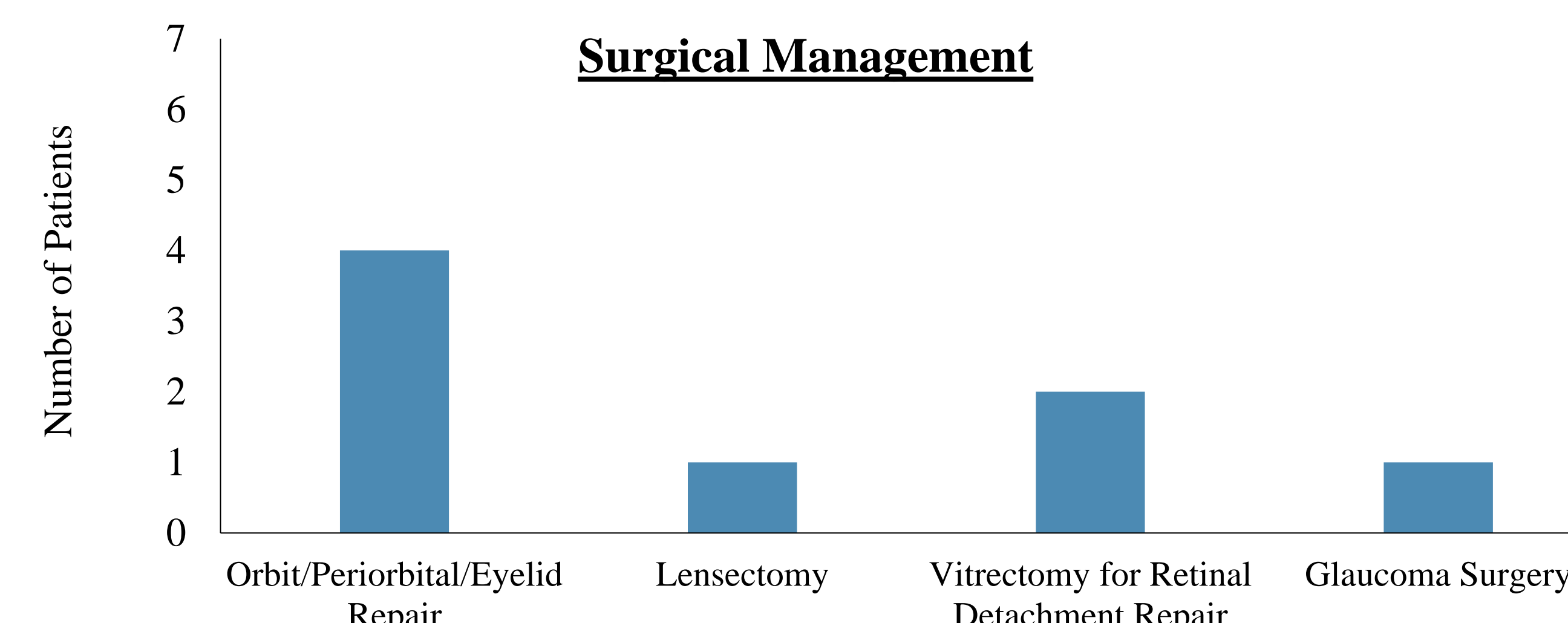
Case #	Presentation	3 Months Post-Injury	6 Months Post-Injury	12 Months Post-Injury
1	20/20	20/20	20/20	N/A
2	20/25	20/25	N/A	20/25
3	CF	20/25	20/25	N/A
4	20/20	20/15	20/15	20/15
5	NLP	NLP	NLP	N/A
6	HM	20/500	20/200	20/200
7	LP	20/250	N/A	20/250



### Medical Management

- Steroids, cycloplegics, and glaucoma drops.
- Quiet Activity
- Retinopexy
- Laser cyclophotocoagulation

### Surgical Management



## Conclusion

- At presentation, 3 patients had mild vision loss (20/40 or better) and 4 patients had severe vision loss (counting fingers or worse).
- 100% of GROIs were due to golf ball trauma.
- All patients were treated with medical management.
- 4 patients required surgical management (4/7 orbit/periorbital/eyelid repair, 1/7 lensectomy, 2/7 vitrectomy for retinal detachment repair, and 1/7 had surgery for glaucoma).
- Complications** included permanent loss of vision, orbit fractures, orbital hemorrhage with compartment syndrome, periorbital and lid lacerations, iris trauma, lens trauma, vitreous hemorrhage, epiretinal membrane, macular hole, retinal detachment, traumatic optic neuropathy, and glaucoma.

## Discussion

- While the incidence of GROIs is low, they are associated with a range of ocular complications and vision threatening consequences.
- Patients with severe vision loss at presentation were more likely to have worse visual outcomes and increased risk of complications.
- None of the patients included in this retrospective review were wearing appropriate eye protection.
- There has been a long history of protective eyewear dating back to 1200 B.C., however, these safety measures are still not widely used or implemented.<sup>5</sup>
- Although protective eyewear has been suggested, there have been numerous concerns from athletes, including impaired vision.<sup>6</sup>
- The best way to prevent a traumatic ocular injury is through polycarbonate protective lenses.<sup>6</sup> Although eyeglasses may offer slight protection, there is a risk of lenses shattering causing damage including facial and lid lacerations.

## Future Steps

- Due to low patient numbers, there is a need to expand this study further to better understand the risk of GROIs in both children and adults.
- Numerous steps can be taken to potentially reduce the risk of GROIs including:
  - Alerting golfers to potential ocular risks.
  - Advocating for the use of protective eyewear during play.
  - Informing stakeholders about the importance of reinforcing golf course rules to improve health and safety.
- PROTECT Initiative**
  - As most literature occurred before 2013, there is a need for an updated multicenter chart review regarding Canadian ocular injuries in **all sporting and recreational activities**.
  - Advocacy campaigns regarding preventative strategies utilizing **community presence and social media outlets** to reach the general public.
  - Advocacy efforts to **decrease concerns about protective eyewear** which may include improving the design of current available protective eyewear.

## References

- Rodriguez JO, Lavina AM, Agarwal A. Prevention and treatment of common eye injuries in sports. *Am Fam Physician*. 2003 Apr 1;67(7):1481-8. PMID: 12722848.
- Park SJ, Park KH, Heo JW, Woo SJ. Visual and anatomic outcomes of golf ball-related ocular injuries. *Eye (London, England)*. 2014 Mar;28(3):312-317. DOI: 10.1038/eye.2013.283.
- Burnsine MA, Elner VM. Golf-related ocular injuries. *Am J Ophthalmol*. 1996 Apr;121(4):437-8. doi: 10.1016/0002-9394(14)70441-6. PMID: 8694737.
- McHardy A, Pollard H, Luo K. Golf injuries: a review of the literature. *Sports Med*. 2006;36(2):171-87. doi: 10.2165/00007256-200636020-00006. PMID: 16564124.
- Mott M. Historical Moments in Sports Eye Protection [Internet]. American Academy of Ophthalmology. 2020. Available from: <https://www.aao.org/eye-health/tips-prevention/sports-eye-protection-history>
- Mott M. Historical Moments in Sports Eye Protection [Internet]. American Academy of Ophthalmology. 2020. Available from: <https://www.aao.org/eye-health/tips-prevention/sports-eye-protection-history>

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