Paediatric Refractive Surgery

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Introduction

- Uncorrected refractive error has a negative impact on development & social interaction in kids and correlates with unemployment and poor general health in adult life.
- Children may not tolerate/wear spectacle correction due to:
  - Facial malformation and ear deformities
  - Autism & aggressive behavior
  - Tremor, poor neck control & severe cerebral palsy
- Photorefractive keratectomy (PRK) or lens- based surgery offers visual rehabilitation.
- We present outcomes of the **Toronto paediatric refractive surgery program.**

Indications

PRK

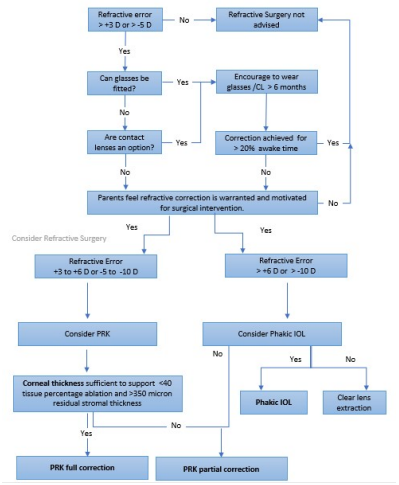
- Bilateral ametropia
  - -5D – -10D for myopia
  - +3.5D – +6D for hyperopia
  - ≥3D astigmatism
- Anisometropic amblyopia
  - Between +3.00D to +7.00D SE if the amblyopic eye is hyperopic.
  - Between -3.00D to -13.00D SE if the amblyopic eye is myopic.
  - SE refractive error in the fellow eye between -4.00D to +3.00D
- Inability to wear glasses or contact lenses more then 20% of day
  - Multiple attempts to tolerate glasses/CL have failed (over >6 months)

Lens-based surgery (lensectomy or phakic IOL) is considered when patients are outside the range for PRK.

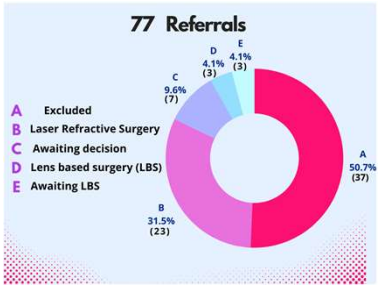
Methods

- Charts were reviewed for all patients referred
- All patients were assessed for meeting the above criteria.
- Preoperative assessment and/or EUA for suitability for refractive surgery.
- The suitability for and choice of surgical technique was made as per the patient's circumstances and the algorithm opposite. .

Evaluation for pediatric refractive Surgery



Results

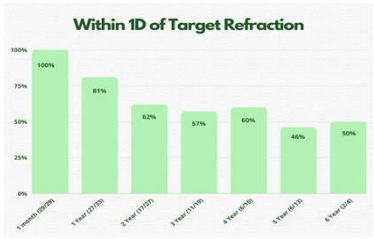


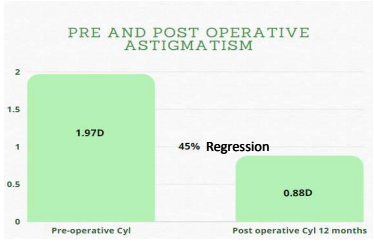
PRK group:

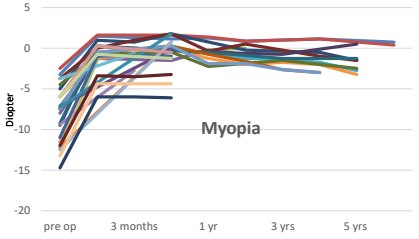
Patients	**23**
Eyes	**42**
Male / Female	**16 / 7**
Age (yrs)	**9.5 (4-18)**
Follow up	**6 months - 6 years**

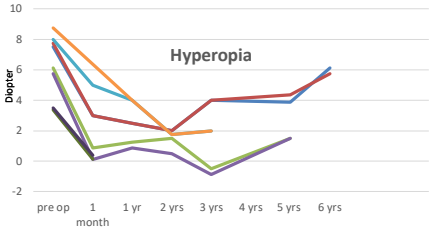
Myopic Astigmatims	Avg	Range	N
Sph	-7.17	(-2.00 to -16:00)	20
Cyl	-2.59	(-1.25 to -6.00)	20
SE	-8.46		
Hyperopic Astigmatism	Avg	Range	N
Sph	6.79	(+4.75 to +11.00)	6
Cyl	-3.46	(-2.75 to -4.00)	6
SE	5.06		
Myopia	Avg	Range	N
Sph	-9.08	(-3.25 to -13.00)	12
Hyperopia	Avg	Range	N
Sph	6.94	(+6.00 to +7.75)	4

Refractive outcomes and regression









Complications

- One slightly decentered treatment.
- One persistent epithelial defect - required temporary central tarsorrhaphy at 1 week = healed with residual mild subepithelial haze.
- No keratitis. No ectasia. No Grade 2 or more haze.

Summary

Refractive surgery

- Indicated in neuro-developmentally challenged children unable to wear refractive correction.
- Requires a lot of planning, EUAs and family cooperation.

PRK

- Is safe.
- Resulted in improved visual behaviour in our cohort of patients.
- Offers predictable postoperative refractive outcomes.
- Refractive regression is higher in the hyperopic group compared to the myopic group.

- Lens-based surgery is considered when PRK is not suitable and refractive error is outside treatment range.

Parent Testimonials

"Learning improved, started speaking." "Much improved behaviour. No issue at school since surgery." "Started smiling at people, started crawling, less anxious and aggressive since surgery". "Improved attention, less impulsivity, less aggressive. Started wearing glasses"

Acknowledgements

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