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Refractive surgery in pediatric anisometropia and its effects on the binocularity

By

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Introduction

Anisometropia is the leading cause of amblyopia and occurs because of unequal refractive error between the 2 eyes.

It is classified into axial and refractive

Studies shown that most if not all anisometropic children are axial.

Introduction

According to KNAPP`s LAW there is no anisokonia with glasses if the type of myopia is axial.

Most children with refractive errors can be treated successfully with glasses or even contact lenses. But many children cannot tolerate glasses or contac lenses….

Introduction

Children with congenital facial deformities may not be able to wear glasses.

Introduction

Children who have cerebral palsy or autism.

Introduction

Children with neuro-behavioral problems that make wearing glasses difficult.

Social habits and cultures in our community make parents refuse glasses for their children.

Introduction

These difficulties in treatment of anisometropia in children arouse the need for trial of refractive surgery in those patients who are unable to tolerate or who failed conventional methods of treatment.

Introduction

So our study was carried out to evaluate the visual, sensory and refractive results of refractive surgery in pediatric patients with anisometropia and amblyopia, and to assess safety and efficacy of these procedures in pediatric age

Patients and Methods:

A prospective non-randomized clinical study was carried out on Fifty-six eyes of fifty-six children with myopic anisometropia (more than 3 diopters) resistant to usual treatment.

LASIK group included 26 patients while PRK group included 15 children besides 15 patients in ICL group.

Age ranged from 5 to 15 years.

All the selected patients were submitted to full medical history taking and full ophthalmological examination including Visual acuity, cycloplegic refraction, anterior segment examination, pupil diameter measurement in normal and dim illumination and fundus examination

Assessment of sensory changes and the detection of suppression by:

Worth's 4 dot test.

- for both far and near
- to detect binocular fusion or suppresion

TNO stereoacuity test:

Good stereoacuity: 15 -30 seconds of arc

moderate stereocuity 60 - 240 seconds of arc

Poor stereoacuity : less than 480 seconds of arc.

Results

UCVA, BCVA and refractive parameters improved dramatically in all groups with more significant improvement in LASIK group compared to the other groups. However, the Preservation of BCVA was better with the ICL group at both immediate healing period and through the 18-month follow up.

	UCVA			BCVA		
	Pre-operative	Post-operative	P-value	Pre-operative	Post-operative	P-value
LASIK	0.09 ± 0.05	0.59 ± 0.23	0.000	0.46 ± 0.26	0.63 ± 0.28	0.022
PRK	0.06 ± 0.01	0.33 ± 0.15	0.000	0.33 ± 0.24	0.55 ± 0.22	0.008
IOL	0.04± 0.01	0.22 ± 0.09	0.000	0.13 ± 0.08	0.42 ± 0.16	0.000

Results

Sensory tests improved after surgery but changes was insignificant in all groups. And there was no statistically significant difference found between 3 groups regarding TNO, W4D for far and W4D for near.

Postoperative		LASIK group		PRK group		ICL group		Test value*	P-value	Sig
		No.	%	No.	%	No.	%			
TNO	Good	13	50.0%	7	46.7%	5	33.3%	2.143	0.710	NS
	Moderate	7	26.9%	5	33.3%	4	26.7%			
	Poor	6	23.1%	3	20.0%	6	40.0%			
W4D for far	Fusion	22	84.6%	13	86.7%	9	60.0%	4.221	0.121	NS
	Suppression	4	15.4%	2	13.3%	6	40.0%			
W4D for near	Fusion	24	92.3%	14	93.3%	9	60.0%	8.704	0.013	NS
	Suppression	2	7.7%	1	6.7%	6	40.0%			

Results

The studied LASIK and ICL groups had mild refractive regression over the 18 month follow-up period (-0.63 D and -0.74 respectively) . While, PRK group showed moderate refractive regression (-1.03D).

Results

Regarding complication, two cases (13 %) of PRK group had a minimal degree of residual corneal haze, One LASIK case suffered from mild degree of late peripheral flap slippage. Also, one patient had high vaulting of the implanted ICL. however, IOP was stable and the patient was under close follow up.

Home message

Refractive surgery is safe and effective for anisometropia treatment. LASIK has a better visual outcomes and ICL has more preserved outcomes.

If refractive surgery was performed at an earlier age, long-term visual outcomes and binocularity would probably be markedly better, and amblyopia treatment would be much easier.

Thank you