Management Outcome of Intermittent Exotropia

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ABSTRACT:
INTRODUCTION: Patients with exodeviation generally progress through clinical stages of exophoria, intermittent exotropia and ultimately constant exotropia. In intermittent exotropia, deviation is manifested intermittently specially during the period of fatigue, illness or visual inattention. This study was conducted to find out the outcome of various modalities of management of intermittent exotropia.

METHOD: It was a prospective study conducted in Department of Paediatric Ophthalmology and Strabismus in Nepal Eye Hospital, Kathmandu. Fifty patients were enrolled in this study, who underwent relevant history taking, ocular examination including visual acuity, cyclorefraction, anterior and posterior segment examination, fixation pattern, orthoptic evaluation including cover uncover test, extraocular muscle movements, amount of deviation for both near and far by prism cover test, stereopsis and binocular single vision. Patients who met the criteria for surgery were managed surgically and the rest of the patients were managed by orthoptic measures and by prescription of glasses. None of the patients were managed with prisms and occlusion therapy. Patients were followed up at 1 and 6 months duration.

RESULT: There was a mean change of 17.02 prism diopter (PD) on presentation versus 12.95 PD on near deviation and from 16.45PD on presentation versus 13.85 PD on distant deviation after six months of conservative management.

The mean change was from 38.12 PD on presentation versus 9.12 PD in near deviation and from 35.62 PD versus 9.65 PD in distant deviation after 6 months of surgical management.

Binocular single vision improved to 73.8% from 50% after six month of conservative management while it improved from 0% to 100% after six month of surgical treatment.

CONCLUSION: There was significant improvement in patients who underwent surgical therapy in terms of ultimate achievement of binocular single vision and ocular alignment for near and distance as compared to patients who underwent conservative management.

KEY WORDS: Intermittent exotropia, binocular single vision, stereopsis

INTRODUCTION

Intermittent exotropia is a unique type of strabismus in which the deviation is intermittently manifested, especially in times of fatigue, illness or visual inattention. Patients with intermittent exotropia have greater than 10 to 12 prism diopters of exophoria and their convergence mechanisms are not consistently adequate to keep the exodeviation latent. Some patients exert voluntary control over their exodeviation.1

Patients of intermittent exotropia start out exophoric and progress to intermittent exotropia at distance in early childhood and gradually show more frequent and longer duration of manifest deviation. Management of this form of strabismus includes observation, conservative therapy like refractive correction, orthoptic exercise, over minus spectacles, alternate patching and surgical intervention. The two reasons for treating intermittent exotropia are cosmetic or psychosocial and functional.2 Stathacopolous et al reported a reduction in distance stereoacuity in intermittent exotropia and reported improvement after treatment.3 This study was conducted to assess the management outcome of various treatment modalities of intermittent exotropia.

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METHOD

It was a prospective descriptive study conducted in Nepal Eye Hospital from May 2011 to May 2012. All new patients with intermittent exotropia attending the department of Paediatric Ophthalmology and strabismus willing to participate in the study during the study period were enrolled. Patients of intermittent exotropia non-consenting to participate and with oblique muscle dysfunction were excluded from the study.

Relevant short history regarding age gender, ethnicity, age of onset and situation during which deviation occurs the most were taken. The average number of waking hours with the deviation was also noted and the family history of strabismus if present was also noted. The clinical examination included visual acuity testing, cover test, extra ocular movements, deviation measurement, binocular single vision, refraction, anterior and posterior segment examination. History, demographic profile and clinical examination findings were entered in a specially designed proforma. The nature of the disease and therapy was explained to the patients and parents and written consent was taken. Ethical clearance was taken from Institutional Review Board of National Academy of Medical Sciences.

After complete evaluation, patients were categorized as good control if exotropia manifested only after cover testing and the patient resumed fusion rapidly without blinking or refixation; fair control if exotropia manifested after fusion is disrupted by cover testing and the patient resumed fusion only after blinking or refixation and poor control if exotropia manifested spontaneously and remained manifest for an extended period of time.

The appropriate modality of management was determined in all cases. Conservative management was done in cases where the deviation occurred in less than half of waking hours, if control was good to fair and deviation was less than 20 prism diopters. Patients with refractive errors were prescribed full correction and active orthoptic treatment was done. Surgical management was done for patients with progression towards constant exotropia despite conservative management and if the deviation occurred more than half of waking hours and if the control was poor and with deviation more than 20 prism diopters as this is the protocol followed in Nepal Eye Hospital. Surgical procedure in most cases is single eye recess-resect procedure. Recession of the lateral rectus was done with Hang Back technique in all the surgical cases.

Patients were followed up after one month and six months of treatment. During follow up, visual acuity, amount of deviation, binocular single vision and stereopsis were measured apart from anterior and posterior segment evaluation. Data were coded and entered in database for statistical analysis. Data analysis was done using SPSS program (version 11.5) and were expressed in percentage, mean, median and mode as and when appropriate.

RESULT

The total number of patients included in the study was 50, with minimum age of 5 years and maximum age of 37 years and mean age of 18.42 years (SD=6.75 years). The mean age of male was 19.25 years and of female was 17.65 years. 46% of patients were between 11-20 years of age followed by 21-30 years (38%) and 0-10 years (14%). Among the participants, 52% were females and 48% were males. Similarly, 76% were of Indo-Aryan origin and 24% of Tibeto-Burman origin.

The squinting of the eye was noticed during visual inattention in 68%, fatigue 50%, stress 10%, illness 10%, awakening 12% and bright light 76%. Eighty four percent of patients had less than 50% of duration of deviation while 16% of patients had deviation more than 50% in twenty four hours.

The onset of intermittent exotropia was between 1-5 years in 58%, between 6-10 years 22%, 11-15 years 8% and 16-20 years 12%. Only 18% of patients confirmed positive family history of squint.

On examination, intermittent exotropia was of basic type in 52%, divergence excess type in 22% and convergence weakness type in 26%. Suppression was seen in 56% of patients and normal retinal correspondence was seen in 44%. Regarding the control of intermittent exotropia, good control was seen in 58%, fair control in 26% and poor control in 16%.

Conservative management was done in 84% (n=42) and surgical management was done in 16% (n=8). Active orthoptic management was done in 84% and glasses were prescribed in 64%. None of the patients were prescribed base in prisms and part time patching.
There was mean change in dioptric power of 17.023PD on presentation vs 12.95PD in near deviation after six month of conservative management. Similarly the mean change of 16.45PD on presentation vs 13.85PD in distant deviation after six month of conservative management. The mean change was 38.12PD on presentation vs 9.12PD on near deviation and from 35.62PD vs 9.65PD in distant deviation in surgically managed participants after six month (Table II).

Table II: Surgical Management: Deviation in Prism Diopters (PD)

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near On Presentation</td>
<td>25</td>
<td>55</td>
<td>38.12</td>
</tr>
<tr>
<td>After one month</td>
<td>8</td>
<td>15</td>
<td>10.62</td>
</tr>
<tr>
<td>After six months</td>
<td>2</td>
<td>15</td>
<td>9.12</td>
</tr>
<tr>
<td>Distant On presentation</td>
<td>20</td>
<td>55</td>
<td>35.62</td>
</tr>
<tr>
<td>After one month</td>
<td>8</td>
<td>15</td>
<td>11.00</td>
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<tr>
<td>After six months</td>
<td>8</td>
<td>15</td>
<td>9.62</td>
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DISCUSSION

Intermittent exotropia is characterized by an acquired, intermittent exodeviation of eye/eyes in an otherwise healthy child. Outcome of this study was measured in terms of attainment of binocular single vision while visual alignment was measured in terms of prism diopters at the conclusion of study. Attainment of binocular single vision signifies the improvement in the sensory function while improvement in motor function was measured in terms of variation in visual alignment.

In the present study, among patients treated conservatively, binocular single vision improved to 73.8% from 50% whereas in the patients who underwent surgery, binocular single vision improved to 100% postoperatively from 0% preoperatively.

In a study by Vinita Singh et al, following orthoptic treatment in intermittent exotropia, even though the basic angle of deviation remained unchanged in most patients, significant functional and symptomatic improvement was obtained in 64% to 85.7% cases. In a study by Reza Asadi et al, orthoptic treatment was...
successful in 88.3% of patients with basic type, all patients in convergence insufficiency type and 88% in divergence excess type. However, Daum's study reported total success with orthoptic treatment in 41% and partial success in 56%

The surgical management of intermittent exotropia has been frustrating in its unpredictability. Success rates reported range from 40-83%. However, in this study 73.8% of patients who underwent conservative treatment developed BSV whereas 100% of patients who underwent strabismus surgery developed BSV. In a study by Chong-qing YANG et al at the end of one year follow-up after surgery, 91.3% had binocular normotropia.

In a long term result of 100 surgically-treated intermittent exotropia, 50% success was observed in patients with surgery and orthoptic treatments and 32% success in patients with surgery alone. Deborah Buck et al concluded that the surgically-treated group was the only group with clinically significant improvement in the angle of deviation. Initial overcorrection has also been proposed to stimulate fusional divergence. We agree with Pratt-Johnson, Berlow and Tilson that a large immediate overcorrection often is not necessary and at times is undesirable. In the present study also overcorrection was not done.

As the sample size of the present study is limited, follow up study with large sample size is recommended to generalize the study results.

CONCLUSION

Binocular single vision improved to 73.80% from 50% after six month of conservative management while it improved from 0% to 100% after six month of surgical treatment.

There was significant improvement in patients who underwent surgical therapy in terms of ultimate achievement of binocular single vision and ocular alignment for near and distance as compared to patients who underwent conservative management. We conclude that surgical management is effective in attaining binocular single vision and controlling deviation in cases of intermittent exotropia in cases where the deviation more than 20 prism diopters.

REFERENCES