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Original Article

Outcome of early surgery in infantile esotropia: Our experience in tertiary care hospital

Col Anirudh Singh [a,*], *Maj Gen J.K.S. Parihar, SM, VSM* [**b], *Col S.K. Mishra* [c], *Col R. Maggon* [d], *Anurag Badhani* [e]

[a] *Senior Adviser (Ophthalmology, Paed Ophthal & Squint), Army Hospital (R&R), Delhi Cantt, India*
[b] *Addl DGAFMS (MR H & Trg), O/o DGAFMS, Ministry of Defence "M" Block, New Delhi 110001, India*
[c] *Senior Adviser (Ophthalmology, VR Surgery), Military Hospital Jabalpur, India*
[d] *Senior Adviser (Ophthalmology, VR Surgery), Command Hospital (Eastern Command) Kolkata, India*
[e] *Senior Resident (VR Surgery), LV Prasad Eye Institute, Bhubaneswar, India*

ARTICLE INFO

Article history:
Received 10 September 2014
Accepted 11 November 2016
Available online xxx

Keywords:
Early surgery
Infantile esotropia
Reoperation

ABSTRACT

Background: Infantile esotropia is a convergent strabismus presenting before 6 months of age and is the most common strabismus disorder presenting in the ophthalmology OPD. The dilemma of whether to go for early surgery and how early has been a matter of research for the last 50 years. We describe our results of surgery in infantile esotropia at variable age groups, as well as with different reoperation rates and compare with the results in western literature.

Methods: A prospective study was carried out through a review of 113 cases operated for infantile esotropia between February 2013 and August 2014. The variables studied were: age at surgery, type of fixation, refractive error, associated nystagmus, inferior oblique overaction or dissociated vertical deviation (DVD), type of surgery performed and pre- and postoperative deviation angles.

Results: There were 67 male and 46 female cases of infantile esotropia. The age group of patients varied from 6 months to 12 years. Latent nystagmus was seen in 22 cases, inferior oblique overaction in 49 cases and DVD (mild) in 14 cases. Bimedial rectus recession was done in 78 cases and recession–resection in non-dominant eye in remaining 35 cases. The postoperative residual deviation was <10 PD in 102 cases, between 10 and 16 PD in 5 cases and more than 16 PD in 6 cases. Only 6 cases (5.3%) required reoperation for correction of residual deviation.

Conclusion: The authors recommend surgery before 12 months in all cases of infantile esotropia. The reoperation rates in the current study were considerably low.

* *Corresponding author.*
E-mail address: dranirudheyesurgeon@gmail.com (A. Singh).
http://dx.doi.org/10.1016/j.mjafi.2016.11.006
0377-1237/

Introduction

Convergent deviation in childhood is the most common strabismus disorder which presents in the ophthalmology clinics worldwide. It affects 1–2% of children. The term congenital or infantile esotropia has been debated for over five decades now. Costenbader advocated 'Congenital' esotropia for all cases[1] manifesting before 6 months and Von Noorden preferred the term 'infantile esotropia'.[2] Various studies by Nixon and Archer failed to provide a concrete data on number of actual esotropes in infants below 4 months.[3] But there seems to have emerged a uniform consensus that unsteady ocular motor behaviour along with absent stereo-response are found in normal infants before 4 months of age.

The characteristics of congenital esotropia agreed upon are, age of onset by 6 months, large angle esotropia, cross fixation, normal neurological status, hyperopia as per age not influencing esotropia, nystagmus in few cases.[4]

The optimum age for surgery in infantile esotropia has fluctuated over the last four decades with an increasing trend towards early surgery. Although there is still no unanimous consensus as to the exact age when infantile esotropia is to be addressed, yet there is recognition that even subnormal binocularity can be achieved only if surgical alignment is achieved.[4–8]

Very few studies have been done in India on the results of early surgery in infantile esotropia due to various factors like deep rooted beliefs on either late surgery or no surgery particularly in rural areas. However, lately there has been an increase in the referral of strabismus cases due to an increased awareness. Our centre, being a tertiary apex centre, has had a number of cases of strabismus over the last year, hence a study on the early surgical alignment in infantile esotropia is bound to generate valuable insight into the outcome of early surgery in infantile esotropia.

Material and methods

A prospective study was conducted to record the outcome of infantile esotropia cases operated between February 2013 and August 2014 at our tertiary care centre in North India. A total of 113 cases were included in the study. The minimum period of follow up was 6 months. Our study had 67 males and 46 female cases of infantile esotropia. The age group was variable between 6 months and 12 years.

The inclusion criterion was defined as deviation angle more than 40 PD, no neurological involvement. Only cases with refraction $<$ 3D hyperopia under atropine were included. Children who developed esotropia after 12 months of age, restrictive or paralytic strabismus, accommodative esotropia, children with neurological disorders and optic nerve anomalies were excluded. Children not cooperative for Randot stereoacuity test were excluded from the study.

Surgery was performed by a single surgeon through fornix approach. Bimedial rectus recession was done in 106 cases and horizontal rectus recess–resect in 7 cases. Graded Inferior oblique recession was done depending on severity of overaction.

The variables analysed were: age at surgery, duration of deviation, sex, refractive error, inferior oblique overaction, dissociated vertical deviation (DVD), nystagmus, type of surgery performed and pre- and postoperative deviation angles. Standard protocol for squint examination was followed:

- Presenting symptom: duration of deviation, age of onset, associated symptoms. Previous treatment was undertaken like occlusion or optical glasses.
- Vision was recorded differently in various age groups. From 6 months to 1 year, the methods used were fixation and follow, CSM fixation (central, steady and maintained) and VEP. For children from 1 year to 3 years Allen picture card and Cardiff acuity cards and for children above 3 years Landolt's C chart or Albini's E chart.
- Retinoscopy was done under atropine in all cases.
- Slit-lamp examination of the anterior segment, and fundus examination was done.
- Orthoptic work up was done which included:
  - Head posture
  - Cover test for distance and near
  - Ocular movements
  - Presence of nystagmus
  - Measurement of deviation with Hirschberg test (in children below 3 years) and Prism bar cover test (in children above 3 years)
  - Cover test
  - Measurement of stereopsis with randot stereoacuity charts
- The outcomes studied included postoperative alignment, amblyopia and binocularity function. Postoperative alignment was followed up for two years following surgery with cover and uncover test, amblyopia was assessed based on the different age groups (Cardiff acuity cards for children below 3 years, Landolt' C chart for cases above 3 years) and binocularity using Randot stereoacuity charts.

The study was approved by the hospital Ethics Committee. Data were obtained from clinical records maintaining patient anonymity. Data analysis was done using Excel 2003, and the different qualitative variables were analysed.

Results

There were a total of 113 cases with 67 male and 46 female cases of infantile esotropia. The age group of patients varied from 6 months to 12 years. There were 82 children in 6 month to 1-year age group, 16 in 1–2 year group, 7 in 2–3 year group, 5 in 4–8 year group and 3 in 8–12 year group (Table 1). Compared to western literature, the age of presentation of infantile esotropia was varied, and there were cases presenting even beyond 2 years.

Duration of deviation was equal to the age at presentation as all the cases had history of manifest deviation before 6 months of age. Free alternation of vision was present in 78 cases (amblyopia in remaining 35 cases from different age groups) (Table 2). Vision testing method was different in groups as the age varied from 6 months to 12 years.

Please cite this article in press as: Singh A, et al. Outcome of early surgery in infantile esotropia: Our experience in tertiary care hospital, *Med J Armed Forces India*. (2016), http://dx.doi.org/10.1016/j.mjafi.2016.11.006