

## Research Article

# Can Clinical Measures of Postoperative Binocular Function Predict the Long-Term Stability of Postoperative Alignment in Intermittent Exotropia?

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**Purpose.** To evaluate whether clinical measures of postoperative binocular functions could predict the long-term stability of postoperative ocular alignment in children with intermittent exotropia. **Methods.** A retrospective study was performed in thirty-nine children (median: 7 years) who have been surgically treated from intermittent exotropia without overcorrection (less than 10 prism diopters [pd] of exodeviation at 1 month postoperatively). Angles of deviation and binocular functions were measured preoperatively and at 1 month, 6 months, and the final follow-up visit (24 months) postoperatively. We examined the relationships between postoperative drift (change of ocular alignment) and binocular functions (sensory fusion, fusional convergence amplitude, and stereoacuity). **Results.** The surgical success rate (esophoria/tropia 5 pd to exophoria/tropia 10 pd) dropped to 76.9% at 6 months after surgery and to 53.8% at individuals' last visit (mean: 37 months). The mean exodrift was  $7.7 \pm 9.2$  pd from the postoperative month 1 to the final visit ( $p < 0.001$ ) on distance fixation. Distance stereoacuity, central fusion, and fusional convergence amplitude significantly improved following surgery ( $p < 0.05$ ). However, no significant correlation was found between their binocular functions measured at the beginning of each follow-up period and the postoperative drift (all  $p > 0.13$ ). **Conclusion.** Our findings suggest that the clinical measures of sensory fusion, fusional convergence amplitude, and stereoacuity cannot serve as a robust predictor for the long-term stability of postoperative ocular alignment in patients who underwent successful surgery without overcorrection at 1 month postoperatively.

## 1. Introduction

Intermittent exotropia (IXT), a disorder that causes either of the eyes to drift outward spontaneously [1, 2], is the most common form of childhood exotropia [3]. It affects approximately 1% of children in the United States [3] and up to 3.5% in Asia [4]. Fusional compensatory mechanisms have been suggested to maintain eye alignment in this type of strabismus [1, 5, 6], allowing the development of binocular function. A common approach for clinicians to treat the patients with a poor control of exodeviation is strabismus surgery [1, 2, 7]. However, whether strabismus surgery benefits the patients longitudinally is nebulous because the

recurrence rate of IXT after surgery has been shown to be high [8–11].

Previously, clinicians have investigated many factors that might be linked with IXT recurrence, such as the age of onset, refractive errors, visual acuity, preoperative angle of deviation, oblique dysfunction, lateral incomitance, and early overcorrection [2, 9, 10, 12]. However, none of the factors seems to influence the long-term outcome of the surgery [13].

Binocular functions (e.g., sensory fusion [14], stereoacuity [15], and fusional convergence [6]) are important for the management of IXT [1, 2]. Clinicians have assessed them in patients to determine the severity of IXT and, therefore,

















