INTRODUCTION

This study aims to evaluate the use of immediate post-operative alignment measurements as a predictor of future alignment stability in fixed suture strabismus surgery.

RESULTS

A total of 54 subjects undergoing fixed suture strabismus surgery were enrolled at the time of surgery. 7 subjects were lost to follow up for their 2-3 months post-operative visit (4 exotropia, 2 esotropia, 1 hypertropia). Of the remaining 47 subjects, 26 (55%) were female and the mean age of all subjects was 46.7 years (range 12-86). 22 subjects underwent surgery for exotropia, 19 for esotropia, and 6 for hypertropia. 20 subjects underwent recession and resection procedure(s) alone, 10 subjects underwent resection or plication procedure(s) alone, and 17 subjects underwent combination recession and resection or plication.

Table 1 summarizes the alignment results. The mean alignment measurement for all surgeries was 2 (range -40 to 20). The stability of each individual’s alignment over time is depicted in the composite graphs (Figure 1a-c) for each type of strabismus present pre-operatively. Two subjects (1 with esotropia, 1 with hypertropia) missed their 1-3 week post-operative appointment, but their pre-operative, immediate post-operative, and 2-3 months post-operative data were included in the Figures.

Table 2 shows the stability of success and failure rates from the immediate post-operative period to the 2-3 months post-operative visit. The overall success rate at 2-3 months defined as ≤10° of horizontal deviation and ≤5° of vertical deviation, was 79% for all subjects. Those subjects falling outside the range were counted as failure surgical results.

The implications of this study on the use of adjustable suture techniques are not concrete; rather, this study highlights the unpredictability of alignment measurements over time. The data in Table 2 shows the stability of successful surgical results over time. These results show that even with ‘sub- optimal’ alignment in the immediate post-operative period, high rates of successful outcomes can still result 2-3 months later. Figure 2 also illustrates this finding in a comparison plot between the immediate post-operative visit and the 2-3 months post-operative visit. This shows poor correlation between these two measurements despite successful results overall, supporting our conclusion that the immediate post-operative alignment is a poor predictor of long-term alignment stability in fixed suture strabismus surgery.

CONCLUSIONS

The relationship between immediate post-operative alignment and future alignment stability in fixed suture strabismus surgery has not been previously described. For study demonstrated that although the surgical success rate was reasonably good, there was poor correlation between the immediate and 2-3 months post-operative alignment measurements.

MATERIALS & METHODS

Subjects undergoing either horizontal or vertical rectus muscle strabismus surgery using fixed suture technique were included and distance alignment measurements were taken approximately 1 hour after surgery completion (immediate post-operative visit), 1-3 weeks after surgery, and 2-3 months after surgery. Five different surgeons (DAF, DTS, DEN, GJR, KMH) performed the surgeries, which included resections and/or resections or plications. We included subjects over 10 years of age and those with adequate fixation in each eye for accurate alternate cover testing. Those with dissociated strabismus and pure oblique muscle surgeries were excluded. All subjects were enrolled at the time of surgery between March 2016 and August 2016 and followed prospectively during their regularly scheduled post-operative clinic visits.

Subjects were analyzed based on pre-operative strabismus type (exotropia, esotropia, hypertropia) as well as type of surgery (recessions(s) alone, resections(s) or plication(s) alone, or combination recession and resection or plication). A Spearman correlation coefficient (r) was used to compare pre-operative measurements from the immediate post-operative visit to the 2-3 months post-operative visit.

RESULTS

The stability of each individual’s alignment over time is depicted in the composite graphs (Figure 1a-c) for each type of strabismus present pre-operatively. Two subjects (1 with esotropia, 1 with hypertropia) missed their 1-3 week post-operative appointment, but their pre-operative, immediate post-operative, and 2-3 months post-operative data were included in the Figures.

Table 1 shows the stability of success and failure rates from the immediate post-operative period to the 2-3 months post-operative visit. The overall success rate at 2-3 months defined as ≤10° of horizontal deviation and ≤5° of vertical deviation, was 79% for all subjects. Those subjects falling outside the range were counted as failure surgical results.

Table 2 shows the stability of success and failure rates from the immediate post-operative period to the 2-3 months post-operative visit. Overall, 25 (83.3%) of the 30 subjects who had a successful result immediately after surgery still had a successful result at the 2-3 months visit. However, 12 (70.6%) of the 17 subjects who had a failure result immediately after surgery still had a successful result at the 2-3 months visit. Overall, supporting our conclusion that the immediate post-operative alignment is a poor predictor of long-term alignment stability in fixed suture strabismus surgery.

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