Retrospective Analysis of Combined Cataract and Strabismus Correction in Adult Population

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Abstract

**Purpose:** To study the effectiveness of combined cataract and strabismus correction in adults.

**Methods:** A retrospective study involving 100 patients who underwent cataract extraction combined with strabismus correction was done. The patients were divided into 2 groups based on measurement of angle of strabismus. Group 1 included cases measuring <60 Prism Diptor and Group 2>60 Prism Diptor.

**Results:** The results were analyzed based on motor alignment and visual outcome. Good motor alignment (<10 PD) was achieved in 60.7% of patients in group 1 while none of the patients had a good motor alignment of <10 PD in group 2. Patients in group 2 underwent a second combined surgery of the other eye after a period of 6 months to attain a satisfactory alignment. However, the second eye was not included in the study. Visual success of BCVA>20/40 was achieved in 91% of patients. There was no statistical difference in BCVA between the two groups. No serious complications were seen post-operatively.

**Conclusion:** Strabismus correction in adults is very effective as it is more than a cosmetic correction. It not only adds to patient satisfaction but also improves their quality of life. Thus, if cataract and strabismus coexist, they can be corrected in a single sitting in selected cases without any significant complications.

Keywords: Cataract; Strabismus; Squint; Vision

Introduction

The co-existence of cataract and strabismus has been reported in literature. However, a consensus as to whether cataract surgery should precede strabismus correction, or both should be done in a single sitting has not been reached [1]. Though combined squint and cataract surgeries have been performed [1-3], a large series of patients has not been studied so far. It was earlier thought that strabismus correction in adults is a mere cosmetic correction which does not hold true anymore. Even in cases with long standing squint there is post-operative improvement in binocular function [4,5]. The binocular field of vision improves, and some may even develop stereopsis. Previous studies have suggested that patients with long standing strabismus may develop post-operative binocular single vision and stereopsis to some extent [6-8]. We know for a fact that binocular vision enables us to extract subtle details which are not available to one eye alone. For the eyes to function in their full capacity, it is required for them to be aligned appropriately. Thus, correction of strabismus at any age is done to restore the eye to normal position for them to function normally. In patients above the age of 50, cataract is the main cause of defective vision and if combined with squint correction will be beneficial for the patient. This reduces the number of surgical procedures and optimizes visual acuity, fusion and binocular single vision in a single setting. Cataract and strabismus surgeries both carry risk of complications, and when done together it is presumed that the frequency will be more. Complications related to strabismus surgery include dellen, inclusion cyst, scleral perforation, anterior segment ischemia, slipped muscle, lost muscle, and fast adherence syndrome and lid retraction [9]. Following cataract surgery posterior capsule rupture, endophthalmitis, retinal detachment, suprachoroidal hemorrhage, cystoid macular edema, posterior capsule opacification can occur [10]. This study reports the risks and benefits of doing combined surgery in adults.

Materials and Methods

Case records of 150 patients who underwent combined cataract and squint procedures from January 2014 to June 2016 were reviewed. Patients who did not fulfill the inclusion criteria were excluded and finally 100 patients were made a part of the study. All patients underwent a thorough anterior and posterior segment examination. The eye with lesser visual acuity was selected for surgery. The angle of deviation was measured by alternate prism and cover test using loose prisms. Sensory evaluation was done only in cases that had good vision using Worth Four Dot test. A written informed consent was taken from all the patients prior to surgery. All cases were performed by a single surgeon trained to do both cataract and squint surgeries under peribulbar anesthesia. First squint correction was performed, and all patients underwent recession and/or resection procedures via a limbal conjunctival incision. Muscles were sutured using 6-0 polyglactin 910 and conjunctiva via 8-0 polyglactin 910. This was followed by small incision cataract surgery using a temporal 5.5 mm incision. A temporal incision was chosen as it is more astigmatically neutral as compared to a superior incision. Post-operatively oral antibiotics, topical antibiotic-steroid combination and lubricants were applied. Post-operative visual acuity, intraocular pressure, anterior and posterior segment evaluation was done. Best corrected visual acuity and alternate prism and cover test were recorded at 1st day, 1 month and 6 months to assess the motor alignment and visual outcome. The results were analyzed at the end of 6 months.

Inclusion criterion

Patients with alternating squint since childhood measuring more
than 20 PD and <80 PD were included in the study. Patients with immature senile cataract and well dilating pupils were selected.

Exclusion criterion

Patients with mature, hyper mature, hard, traumatic and subluxated cataracts were excluded. Cases that had any corneal opacity, retinal/macular pathology or glaucoma that would affect post-operative visual acuity were also excluded. Patients with pseudo exfoliation, small pupils and deep sockets that could cause intraoperative complications were not made a part of the study. Restrictive, paralytic and vertical squints presenting with diplopia or abnormal head posture were not included. Also, high myopes (Axial length >26.5 mm) were excluded as there would be an increased risk to scleral perforation in such cases.

Statistical analysis

Data was analyzed descriptively first. Paired sample t-test was used to compare the mean difference pre-operative versus post-operatively. Best corrected visual acuity and alternate prism and cover test data were analyzed using paired sampled t-test. A two-sided p value of <0.05 was statistically significant. All analysis was done by using the SPSS (SPSS, Chicora, IL) software for Windows.

Results

The mean age was 57.6 ± 9.3 years and age ranged from 30 years to 78 years. In group 1 the age range was 56.9 ± 9.1 years and in group 2 it was 56.7 ± 10.1 years. There was no statistical difference between the groups (p=0.5) in terms of age. Majority of the patients presented with alternating exotropia (95% n=95). Only five patients had alternating esotropia. The comparison of gender and operated eye is given in Tables 1 and 2 respectively. Though there were more females in the study, no gender predilection has been reported in the community. This could be a selection bias by the authors.

Exclusion criterion

In cases where the angle of deviation was between 20 to 25 prism diopter (PD) only one muscle was operated. 10 patients with exotropia <25 PD underwent lateral rectus recession only. 90 patients had angle of deviation >25 PD and underwent unilateral recession-resection procedure (Table 4).

The comparison between angle of deviation pre-operatively and post-operatively showed significant improvement in all the groups (p<0.0001). 51% of the cases had prism bar cover test (PBCT) <10 PD. Pre-operatively 36% of the patients had >60 PD of deviation which reduced to <40 PD in all the patients post-operatively. However, all the patients required a second surgery to achieve good motor alignment (<10 PD) (Table 5).

Comparison of the pre-operative and post-operative BCVA and prism bar cover test.

76% of the patients had vision <20/200 pre-operatively while 99% of the patients had vision >20/200 post-operatively. Out of this 46% had best corrected visual acuity (BCVA) >20/32 and 91% >20/40. Table 3 shows the comparison between the pre-operative and post-operative best corrected visual acuity. The only patient with BCVA <20/200 developed posterior capsule opacification which was treated with NdYAG laser capsulotomy and the patient subsequently showed improvement in vision.

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Comparison of the pre-operative and post-operative BCVA and prism bar cover test showed significant improvement which was statistically significant (p<0.0001).

Pre-operative BCVA in Group 1 was 47.77 ± 12.9 and in Group 2 was 47.98 ± 12.44. Post-operative BCVA in Group 1 was 9.76 ± 8.9 and in Group 2 was 9.75 ± 9.34. There was significant improvement in visual acuity post-operatively in both the groups but there was no statistical difference between Group 1 and 2 (p>0.4) (Tables 6 and 7).

There were no significant complications at the end of 6 months in any of the patients. On the first post-operative day there was chemosis, lid edema, corneal edema and anterior segment inflammation which resolved subsequently at the end of 1 week. Grave complications like anterior segment ischemia and endophthalmitis were not seen in any of the patients.
Discussion

The results clearly show that this procedure is safe and gives good results in both the defined outcomes i.e., motor alignment and visual success in one sitting. Thus the patient does not have to undergo two subsequent surgeries.

The results of our study show that 91% patients showed improvement in best corrected visual acuity (>20/40) and 98% had BCVA>20/60. 51% showed significant improvement in motor alignment (<10PD). Patients with pre-operative PBCT>60 PD required a second surgery to obtain improved motor alignment. Even though all the patients in the study developed squint before cataract, the visual outcome and motor alignment was good. Thus, it suggests that cases that have alternating squint with equal dominance develop good post-operative alignment and visual acuity (Figures 1-4). None of the patients had binocular interaction in the past as they had squint since childhood; however post-op motor alignment was good. Contrary to the study conducted by Sujata Guha, MD, Sankara Nethralaya, Vision Research Foundation, Chennai, India [2] which suggested that patients with long standing strabismus developed poor motor alignment post-operatively, our study has shown good post-op results. The reason for this could be that all our patients have alternating squint and no predominant eye which could have been a reason of poor alignment in their study. Since we operated patients with large angles of squint it was not necessary to do cataract surgery before squint correction. Literature search of combined lens and strabismus surgery revealed that a number of reports have been published. However a large case series has not been reported.

Conclusion

It was seen that most of the patients did not know that their squint could be corrected. After proper counselling, patients agreed for combined surgery and were satisfied post-operatively. This study has proved that educating people about correction of strabismus along with cataract extraction gives them not only improvement in vision but also reduction in angle of squint. None of the patients had binocular function pre-operatively as suggested by Worth Four Dot Test. Post-operative sensory evaluation was not evaluated which was a limitation. In cases with good pre-operative vision, sensory evaluation could be done henceforth.

It was also presumed that the complication rate in a combined surgery would be more. However, none of the patients in our study had intraoperative or post-operative complications. Only one patient developed posterior capsule opacification at the end of 6 months. Thus, in the hands of an experienced surgeon combined squint and cataract surgery gives good results. The small sample size is a limitation of the study. Further studies need to be conducted to validate our results.

References