Split Macular Fixation - Our Experience

Abstract

1. **Objective**: To assess the risk of loss of central vision in patients with split macular fixation undergoing surgical therapy.

2. **Design**: Retrospective study based on our medical records.

3. **Participants and/or controls**: 44 eyes of 37 patients with split macular fixation that presented to our glaucoma clinic and underwent filtering surgery from June 2004 to May 2009 were analyzed.

4. **Intervention or methods**: 32 eyes underwent trabeculectomy, rest underwent combined cataract and filtering surgery.

5. **Main outcome measure**: Postoperative intraocular pressure, change in visual acuity and visual fields (central 5°).

6. **Results**: 1 patient wiped out after surgery. Chances of loss of central vision are low even if central 5° shows split fixation. (2.27% among surgical patients). 2 had decrease in quality of vision due to prolonged hypotony (4.54%).

7. **Conclusions**: Risk of wipe out with surgery low (93.19% had good vision. 97.73 did not wipe out)). So surgery should not be withheld due to risk of wipe out when target intraocular pressure cannot be maintained medically.

Introduction

It has been taught for a long time that patients with advanced glaucoma stand a risk of total loss of vision with surgical therapy. Von Graefe introduced glaucoma surgery in 1856; he noted that central vision may be involved postoperatively in patients with constricted visual fields1. Sugar is quoted as: “In a patient with simple glaucoma who sees with only one eye and who has a small central field of 15 degrees or less, medical treatment should be the only treatment.”2. Kolker et al reported sudden loss of central vision also occurred following cataract extraction (8.7%) and glaucoma filtration surgery (13.6%). No patient lost central vision suddenly following surgery when fixation was not split on field charting at the time of operation3. After this landmark study it became routine to explain about wipe out or snuff out of vision after glaucoma surgery. Glaucoma surgeons the world over became more reluctant to operate on advanced glaucoma cases because of fear of wipe out.

Some other experts denied the possibility of wipe out altogether4,5. More recent study by Topouzis et al concluded that there was no risk of wipe out6. But his series of patients had no patient with a split macular fixation. The AGIS study which is quoted as the landmark study also did not specifically address the situation where macular split was present on fields7. This leaves a lacuna in our knowledge which we tried to fill with our study.

Objective

The objective of my study is to assess the risk of loss of central of central vision in patients with split macular fixation undergoing surgical therapy.

Design

This was a retrospective study based on our medical records.

Materials and methods

Macular threshold was obtained using the macular programme on the Humphrey field analyzer (model 720i). This programme uses a full threshold strategy and a size V stimulus size. Split macular fixation was defined for the study as one of the four points abutting fixation on the macular programme having a sensitivity of single digit (less than 10, normal threshold in these locations are in the 30s) with an adjacent point on the same side of fixation also being less than 10 (see fig 1 below)8.
44 eyes of 37 patients with split macular fixation that presented to our glaucoma clinic and underwent filtering surgery from June 2004 to May 2009 were analyzed. All patients were deemed not to have achieved target intraocular pressures with maximal medical therapy.

The mean age of patients included was 52.75 years (range 24-77, standard deviation of 12.37). There were 19 male patients and 18 female patients. The mean pre operative intraocular pressure was 33.38 mmHg (range 52 -19, standard deviation 9.77).

The diagnoses of these eyes were variable, though primary open angle glaucoma accounted for most cases. 26 eyes had primary open angle glaucoma, 12 had chronic angle closure glaucoma and 3 had combined primary open angle glaucoma and angle closure glaucoma. There was 1 eye with angle recession glaucoma and 2 eyes with intractable probably steroid induced glaucoma (2 eyes of the same patient. In a patient who self medicated for years for allergic conjunctivitis with dexamethasone drops).

Visual acuity ranged from 1/60 (4 eyes) to 6/6 (10 eyes) preoperatively.

Intervention

32 eyes underwent trabeculectomy; rest underwent combined cataract and filtering surgery. The decision for combined surgery was made whenever the cataract was visually significant.

Results

The mean pre operative intraocular pressure was 33.38 mmHg (range 52 -19, standard deviation 9.77). Post operatively the mean intraocular pressures achieved at 2 months was 11.31mmHg (range 4-18, Standard deviation 3.51). There was a mean improvement in visual acuity of 0.59 lines on Snellen acuity (range of -2 to 5 lines, SD of 1.69). The field thresholds were not significantly different pre and post operatively once long term fluctuation in field thresholds were accounted for (except in the 1 patient who wiped out where all sensitivity was lost).

1 patient wiped out after surgery. This patient had a preoperative visual acuity of 6/60 and underwent a combined cataract and filtering surgery. He had no perception of light on the 2nd postoperative day. He was a hypertensive on treatment. He had a hyphema on the 2nd postoperative day with a visible clot in the anterior chamber in the surgical area. His IOP was 54 mmHg on that day. This was controlled with medical measures, but his vision was lost. The rate of wipe out in our study was thus 1/44 (2.27% with a confidence interval of 0 to 5.283%).

2 had decrease in quality of vision (4.54% CI 0.28 -8.80%). 1 patient who was 6/6 preoperatively stabilized at 6/12 after 2 months of hypotony. Another patient who had a preoperative vision of 6/18 stabilized at 6/36 due to a macular hemorrhage noted 1 week post operatively. Both these incidents were probably due to hypotony.

Discussion

From our study we find that the risk of wipeout is less than what was thought before. The risk was estimated to be in the range of 10% in the past (8.7% for cataract extraction and 13.6% for glaucoma surgery) . Our study gave us a wipe out rate of 2.27%. The 95% confidence interval calculated on this rate placed the actual risk of wipe out between 0 to 5.283%. If we look at the brighter side 97.73 % of eyes did not wipe out. Therefore almost all eyes benefit from surgery as an option to lower intraocular pressure even with advanced glaucoma with split macular fixation.

On the other hand unlike the more recent literature suggesting that wipe out does not exist we can say that there is a definite risk of wipe out. Even though the risk is lower than was previously thought.

Hence surgery as an option to achieve target intraocular pressure should not be withheld when medical therapy is inadequate. The risk of wipe out with surgery is much lower than risk of loss of visual function from uncontrolled glaucoma.

The risk of decrease in visual acuity was 4.54%. These were the consequence of hypotony in our series. Sudden hypotony can cause macular hemorrhage which is another cause for wipe out and degradation of vision. Long standing hypotony can decrease visual acuity and cause metamorphopsia. Hence hypotony lasting over 6 weeks should be viewed seriously and treated.

Conclusions

Risk of wipe out and loss of central vision with surgery are much lower than was thought (93.19% had good vision. 97.73 did not wipe out). So surgery should not be withheld due to risk of wipe out when target intraocular pressure cannot be maintained medically. In our series hypotony accounted for more of the decrease in visual acuity than a spike in intraocular pressure or cataract formation post operatively. The one case of wipe out however was due to a post operative spike in intraocular pressure.

References