

Impact of cataract surgery on the quality of life of patients with advanced glaucoma

Abstract

Aim: To describe changes in the quality of life and visual performance of advanced glaucoma patients after lensectomy.

Materials and methods: Retrospective cohort study of patients with advanced glaucoma requiring cataract surgery between March and September 2018 at the Glaucoma Service of Hospital Oftalmológico Santa Lucía. Advanced glaucoma was defined as present when there was a cup/disc ratio > 0.8, visual field damage within 10 degrees of central fixation or a temporal visual field remnant. Standard phacoemulsification surgery with intraocular lens implantation was performed. An adapted low-vision quality of life questionnaire was administered before surgery and one month postoperatively.

Results: A total of 9 patients (6 women and 3 men) were included. The age range was 29 to 88 (mean: 71 years). Visual acuity improved in most cases and there was an improvement of sensitivity in mean deviation and model standard deviation, as well as in the areas of quality of life evaluated.

Conclusion: Cataract surgery should be considered as an alternative in cases of advanced glaucoma and stable intraocular pressure, since a substantial benefit in the function and quality of life of patients has been observed.

Keywords: advanced glaucoma, cataract surgery, quality of life

Volume 13 Issue 2 - 2023

Gabriel D'stefano

Santa Lucía Ophthalmological Hospital, Argentina

Correspondence: Gabriel D'stefano, Santa Lucía Ophthalmological Hospital, Advanced glaucoma, Buenos Aires, Argentina, Tel 011 4127-3100, Email gabrieldistefano@hotmail.com

Received: March 28, 2023 | **Published:** June 06, 2023

Introduction

Glaucoma is an asymptomatic disease in the early stages. Changes in the visual field usually begin in the periphery and the central region is usually compromised in the advanced stages of the disease evolution.¹⁻⁴ Many terms are used in the literature to define advanced glaucoma, such as visual field loss within 10° of fixation and mean defects greater than 12 dB.¹⁻⁴ The loss of the visual field due to glaucoma generates a great deterioration in the daily life of people, such as eye-hand coordination or the increase in falls or risks of traffic accidents, either as drivers or pedestrians.⁵⁻⁷ This is due to the inability to detect moving objects and peripheral visual field disturbances. In glaucoma, the loss of the visual field, contrast sensitivity and visual acuity affect the quality of life of patients related to their vision.^{1,2,8} Quality of life in relation to your vision can be defined as the satisfaction of your visual ability and how your vision affects your daily life.^{9,10} With the advent of new drugs and surgeries to control intraocular pressure (IOP), the prevalence of cataracts has increased, added to a longer life expectancy of the population.¹¹

The prevalence of cataracts is higher in patients with advanced glaucoma.¹² The management of these patients is usually complex, since those with advanced glaucoma have a potential risk of reduction and/or fluctuation of their vision and visual field due to pressure increases.¹³ Optic neuropathy from glaucoma is irreversible and lack of visual recovery or loss after cataract surgery can be disappointing for the patient. Therefore, due to risks including vision loss and increased IOP, many physicians discourage cataract surgery and continue with conservative treatment.³ The objective of this study is to evaluate those parameters in relation to visual quality that influence daily life and thus add one more criterion when making decisions in patients with these characteristics.

Material and methods

A retrospective cohort study was carried out, which included 9 patients with an indication for cataract surgery (in one or both eyes)

and with advanced glaucoma, diagnosed and treated in the Glaucoma service of the Santa Lucía Ophthalmological Hospital in the city of Buenos Aires between March and September 2018. The inclusion criteria were: patients with medical studies confirming advanced glaucoma, IOP less than 24 mmHg, cup-disc ratio greater than 0.8, defects in the visual field typical of the disease, manifest cataract according to the LOCS III classification (Lens Opacity Classification System) in the eye to be operated on, no other ocular disease (such as keratopathy, uveitis, age-related macular degeneration or some other retinopathy), without severe involvement due to systemic diseases and consent to undergo cataract surgery after having given the corresponding explanation of the possible complications. Patients who had previously received laser therapy (peripheral iridotomy or iridoplasty) were also included. Patients with psychiatric disorders and also those who had intra- or post-surgical complications in cataract surgery were excluded, since visual expectation would be affected. The purpose of the surgery, its risks and the impossibility of ensuring an optimal visual result were explained to all the patients prior to the intervention. Patients with advanced glaucoma were defined as a cup-disc ratio greater than 0.8, with severe visual field damage with threat of fixation within 10 degrees of the center, and a mean defect less than 12 dB. All included patients were provided with written informed consent.

Procedure

Basic information such as name, age, sex, best corrected visual acuity (measured at a distance of 3 meters with a Snellen chart adapted for that distance), Humphrey visual field, Goldman tonometry, and a questionnaire on quality of life (an adapted version was used) of the low vision quality of life Questionnaire were used for the database. All surgeries were performed by the same surgeon, who performed a clear corneal phacoemulsification technique in all cases. Intracameral 1% lidocaine anesthesia, adequate pharmacological mydriasis, implantation of a foldable intraocular lens (from Rayner or Aurolab) in the capsular bag was used. There were no intra-or post-surgical

complications in the included patients. Follow-up was carried out for one month. The information was collected prior to surgery and a month after it was performed. In the event that the patient had needed second eye surgery, data collection was performed one month after the latter. An adapted version of the questionnaire was used low vision quality of Life10,^{14, 15} which includes 26 items grouped into four subgroups: general vision, mobility, psychological aspect, and activities of daily living. A subjective score from 1 to 10 was given to each response, with 1 being the worst score and 10 being the highest. All patients completed the questionnaire in a face-to-face interview.

Results

9 patients were included, 6 women and 3 men. The mean age was 71 years with a range of 29 to 88 years. There were 12 eyes in which cataract surgery was performed. The best corrected visual acuity in the preoperative period in the operated eyes was in a range of 20/500 to 20/40, and the mean was 20/63. One month after surgery, the visual acuity of these patients was evaluated again, which ranged from 20/200 to 20/20 with a mean of 20/25 (Table 1). In most of the patients an improvement in visual acuity was evidenced. Only in two cases where pre-surgical visual acuity was severely impaired was the increase in this not significant. The IOP in all cases remained at levels

similar to the measurements made prior to surgery (Table 1). The mean deviations (MD) and model standard deviations (DSM) underwent changes in sensitivity as the mean MD of the operated patients was -18.57 dB prior to surgery and -14.45 Db after it. The mean DSM was 7.51 Db and 7.97 Db before and after surgery (Table 1).

This shows us that the average sensitivity suffered improvements, but not the localized scotomatous defects. With respect to the spheres evaluated in the quality of life of the operated patients, all of them presented decreases in their vision in the different activities they carried out on a daily basis, as well as in mobility and in the psychological aspect. In most cases these items improved after cataract surgery. In a case, no significant change was observed in these aspects. Regarding the general vision, the mean score was 2.62 before surgery and 7 after it (Table 2). Mobility and dependence on a third party to carry out activities is one of the areas in which the greatest change was observed, going from an average score of 1.83 points to 8.66 points (Table 2). Many of the patients reported being frustrated by the situation they were going through, evidencing a mean score of 2.75 prior to the intervention and a mean score of 5.75 afterwards (Table 2). Writing and reading are aspects that were also affected. A subjective improvement of 2.5 to 9 points was observed in them (Table 2).

Table 1 Data of the patients who completed the survey

Patient	Sex	Age c/d ratio	Av Mc pre	Av Mc pos	Pre IOP (RE-LE)	IOP pos (RE-LE)	CVC pre (RO-OI)	CVC pos (RO-OI)	
M.N	F	78	0.9	20/300	20/100	16 w/treatment	10 w/treatment	DM -31.72 DSM 5.67	DM -30.79 DSM 6.53
			I	No light	No light	zero	zero	-	-
P.B	F	72	0.8	20/40	20/40	10 w/treatment	12 w/treatment	DM-20.84 DSM 10.17	DM-19.87 DSM 10.38
			0.8	20/80	20/25	12 w/treatment	12 w/treatment	DM-17.25 DSM 8.26	DM-15.13 DSM 10.01
B.L	m	67	0.8	20/20	20/20	22 w/treatment	12 w/treatment	DM-10.21 DSM 2.81	DM-9.21 DSM 2.76
			0.8	20/300	20/20	20 w/treatment	12	DM-8.14 DSM 4.23	DM-4.75 DSM 2.92
B.E	F	82	I	No light	No light	22 w/treatment	Without treatment	-	-
			0.9	20/40	20/20	10 w/treatment	22	DM-17.56 DSM 8.26	DM-8.17 DSM 3.22
C.R	m	88	I	20/500	20/200	21	w/treatment	Not evaluable	DM-32.42 DSM 2.74
			I	20/400	20/25	w/treatment	10 w/treatment	DM-22.32 DSM 11.46	DM-26.11 DSM 10.99
T.E	F	79	I	20/63	20/25	12 w/treatment	24	DM-17.42 DSM 12.18	DM-15.69 DSM 14.13
			I	20/63	20/20	14	w/treatment	DM-19.59 DSM 12.54	DM-18.52 DSM 14.94
N.F	m	76	0.8	20/20	20/20	Without treatment	12 w/treatment	DM -10.32 DSM 2.74	DM-32.42 DSM 2.74
			I	20/40	20/25	12	14	DM-22.02 DSM 14.46	DM-16.06 DSM 13.47
A.P	F	29	I	20/20	20/20	Without treatment	Without treatment	DM-8.32 DSM 4.34	DM-8.42 DSM 3.74
			I	20/40	20/20	18	12	DM-22.77 DSM 6.65	DM-24.22 DSM 12.20
M.J	F	71	0.8	20/20	20/20	w/treatment	Without treatment	DM-10.32 DSM 2.74	DM-32.42 DSM 2.74
			I	20/40	20/20	12 w/treatment	16	DM-23.22 DSM 6.46	DM-14.06 DSM 4.47

Table 2 Visual quality survey and its impact on quality of life

	Before the surgery mean (range)	After surgery mean (range)
How is your overview	2 (1-6)	7 (3-10)
Your vision when you are tired	2 (1-3)	7 (3-10)
His vision at night inside his house	2 (2-5)	7 (3-10)
Your vision when there is the right amount of light	3 (1-4)	8 (4-10)
Glare problems	3 (1-4)	5 (2-10)
Your vision when seeing traffic signs	2 (1-3)	7 (3-10)
Your vision when watching TV	3 (2-10)	8 (3-10)
Your vision when seeing moving objects	3 (1-7)	8 (3-10)
Mobility	1 (1-6)	9 (1-10)
Measuring the distance to an object	2 (1-7)	8 (1-10)
Seeing steps	2 (1-7)	9 (1-10)
Moving out of your house	2 (1-7)	8 (1-10)
Cross a street with traffic	2 (1-7)	9 (1-10)
Overview	2 (1-7)	9 (1-10)
You are unhappy with the situation you are going through with your glaucoma	3 (1-5)	4 (1-7)
You are frustrated by not being able to perform certain activities	2 (1-5)	6 (1-10)
It is restricted to be able to visit family or friends	1 (1-3)	7 (1-10)
His clinical condition was well explained	5 (1-7)	6 (1-10)
Can read newspaper and books well	2 (1-7)	9 (1-10)
Can read container labels well	2 (1-7)	9 (1-10)
Can read your letters or emails well	2 (1-7)	9 (1-10)
Has trouble using tools	2 (1-7)	9 (1-10)
Can read time from a clock	2 (1-7)	9 (1-10)
Can write well	2 (1-7)	9 (1-10)
Can read what you write	4 (1-7)	9 (1-10)
You can perform daily activities	2 (1-7)	9 (1-10)

Discussion

In the literature we found only one article that documented the changes that occur in vision and their impact on quality of life after cataract surgery in patients with advanced glaucoma.¹⁰ In this work it is possible to analyze results similar to those expressed in that article. Visual acuity can be severely impaired in patients with cataracts and advanced glaucoma. Visual acuity can improve significantly after cataract surgery. Despite this, scotomatous defects found in the visual field fail to do so in the same way and remain very similar after surgery. This is evidenced by the DSM values that as expected in advanced glaucomas do not usually have significant changes. Patients with poor pre-surgical visual acuity were the ones with the greatest chance of achieving improvements in it after surgery. Therefore, it can be considered that lensectomy would be beneficial in cases of advanced glaucoma.

Studies evaluating changes in visual acuity are insufficient because they measure macular function and not visual function as a whole. These changes are believed to be caused by cortical neuroplasticity. The analysis of the questions asked about the visual quality in the daily life of the patients makes it possible to show that they present a great improvement, not only in visual function but also in their mobility and independence, which has repercussions in the social and psychological field. Improved vision at night and in bright conditions, when looking at moving objects or traffic signs, may be the result of improved contrast sensitivity after lensectomy. Theoretically, cataract extraction does not improve the peripheral visual field damaged by glaucoma, although an increase in the average sensitivity of the visual field can be analyzed, which could be because the defects would

be improved. Relative coughs that occur around the campimetric absolute damage.

In the psychological sphere, an important change is observed that is due to an improvement in visual acuity, fewer limitations to carry out social activities and a reduction in the dependence on third parties to carry them out. These psychological and social changes that occur favor reintegration into society. Then patients with advanced glaucoma and cataracts improve their ability to self-care and independence, which improves their quality of life. Ophthalmologists should not abandon cataract surgery as an indication in advanced glaucoma; patients must be offered this possibility, since in most cases significant improvements are observed in the objective and subjective parameters evaluated. Although the risks of complications exist, these are rare in practice and patients would benefit more from having a lensectomy.

Like any study, this one has its limitations. First, the sample of patients is small and all those included belong to the same hospital. Second, patients with complicated cataracts such as dislocated lens were not included. Those patients who suffered post-surgical complications were also not included, since it was considered that the final result could be affected. Likewise, another limitation is the follow-up time, which would have been interesting to consider as three months instead of one month, to avoid possible misinterpretation, since a month after surgery other factors may affect the patient's opinion, such as residual inflammation, pseudophakic macular edema, or a slower postoperative course. Also, as it is a small sample, in the literature there is not much evidence in this regard, but the evaluation of specific indices such as visual field, contrast sensitivity and visual acuity do not fully consider the patient's quality of life and neglect

the main objective of treatment, which is visual rehabilitation and performance in daily life.

Conclusion

In daily practice, ophthalmologists are often pessimistic about the prognosis of patients who have advanced glaucoma and must undergo a lensectomy; more in those patients who present a very deteriorated visual acuity. This work seeks to add evidence to the reviewed bibliography and demonstrate that despite the poor prognosis of the pathology, patients can benefit from cataract surgery, since visual acuity, mean campimetric sensitivity and, above all, changes in the style of patients' lives are progressing favourably.

Acknowledgments

None.

Conflicts of interest

The author declares that there are no any conflicts of interest.

References

- Giaconi JA, Law SK, Nouri MK, et al. *Pearls of glaucoma management*. Berlin. Springer. 2016.
- Lim R, Goldeberg I. *Glaucoma in the twenty-first century*. The glaucoma book. Berlin. Springer. 2010.
- Joaquin QRM, Khu PM, Florcruz NVD, et al. Risk of visual loss in advanced glaucoma after trabeculectomy and combined cataract surgery. *Philipp J Ophthalmol*. 2006;31(1):8–13.
- Keltner JL, Johnson CA, Cello KE, et al. Classification of visual field abnormalities in the ocular hypertension treatment study. *Arch Ophthalmol*. 2003;121(5):643–650.
- Canadian ophthalmological society evidence-based clinical practice guidelines for the management of glaucoma in the adult eye. *Can J Ophthalmol*. 2009;44(1):S7–93.
- Mc Gwin, Xie A, Mays A, et al. Visual field defects and the risk of motor vehicle collisions among patients with glaucoma. *Invest Ophthalmology Vis Sci*. 2005;46(12):4437–4441.
- Crabb DP, Smith ND, Rauscher FG, et al. Exploring eye movements in patients with glaucoma when viewing a driving scene. *PLOS One*. 2010;16(5):e9710.
- Skalicky SE, Martin KR, Fenwick E, et al. Cataract and quality of life in patients with glaucoma. *Clin Exp Ophthalmol*. 2015;43(4):335–341.
- Parrish RK, Gedde SJ, Scott IU, et al. Visual function and quality of life among patients with glaucoma. *Arch Ophthalmol*. 1997;115(11):1447–1455.
- Xu X, Sun Q, Ma YY, et al. Vision related quality of life outcomes of cataract surgery in advanced glaucoma patients. *J Glaucoma*. 2016;25(1):e5–11.
- Mc Kean, Wang Y, Wu J, et al. Impact of visual field loss on health-related quality of life in glaucoma: The Los Angeles Latino Eye Study. *Ophthalmology*. 2008;115(6):941–948.
- The advanced glaucoma intervention study: effect of cataract on visual field and visual acuity. *Arch Ophthalmol*. 2000;118(12):1639–1652.
- Kass MA, Heuer DK, Higginbotham EJ, et al. The ocular hypertension treatment study. A randomized trial determines that topical ocular hypotensive medication delays or prevents the onset of primary open-angle glaucoma. *Arch Ophthalmol*. 2002;120(6):701–713.
- Nayak BK, Maskati QB, Parikh R. The unique problem of glaucoma: under-diagnosis and over-treatment. *Indian J Ophthalmol*. 2011;59(1):S1–S2.
- Zou H, Zhang X, Xu X, et al. Development and psychometric tests of the Chinese-version low vision quality of life questionnaire. *Qual Life Res*. 2005;14(6):1633–1639.