



Original Research Article

Intraindividual study of anxiety and pain in sequential cataract surgery

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ABSTRACT

Purpose: An understanding of the patient's anxiety and pain and differences if any between the first and second cataract surgery can help patients, paramedics and surgeons to plan and execute a surgical procedure which is tailor made to the individual patient's expectations, capabilities and weaknesses and ensure a happy patient and an even happier surgeon. This study was therefore proposed to compare bilateral cataract patient's evaluation of pain and anxiety between first and second phacoemulsification surgery under topical anaesthesia.

Materials and Methods: A prospective observational study was carried out, recruiting 60 patients of bilateral cataract scheduled for sequential phacoemulsification surgery under topical anaesthesia. The patients were assessed for anxiety in the preoperative room and for operative pain in the postoperative room by a numbered Visual Analog Scale (VAS) and modified Wong-Baker faces scale. Peroperative assessment of surgeon's comfort and patient satisfaction and comfort were recorded by a questionnaire, administered by a trained investigator.

Results: Mean anxiety score was 3.15 ± 1.21 (Mean \pm SD) for first eye surgery and 1.58 ± 0.89 for second eye surgery and was statistically significant ($p < 0.001$) with 81% patients giving more anxiety score for first eye surgery. Mean pain score was 0.73 ± 0.86 for first and 2.17 ± 0.90 for second eye surgery and was statistically significant ($p < 0.001$) with 85% patients having more pain score for second eye surgery. No significant difference was observed in the surgeon's grading of operative comfort and satisfaction between the two procedures.

Conclusions: Higher visual disability, expectation from surgery and higher psychological stress lead to higher anxiety and lower pain score in first eye surgery, while previous successful surgery and operative experience lead to lower anxiety scores in second surgery. A relaxed mental state with consequent attention to operative process leads to higher pain score during the second surgery. Contrary to popular reasoning, patients undergoing second eye cataract surgery need a more detailed explanation of the operative procedure, anaesthesia techniques and outcomes.

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1. Introduction

Cataract surgery is the world's most commonly performed surgical procedure. Clear corneal Phacoemulsification under topical anaesthesia has emerged as the most favored technique for cataract surgery. Advances in machines, fluidics and viscoelastics have made the procedure quicker,

safe and successful. Topical anaesthesia is rapid and easy to administer, causes no discomfort, does not raise intraocular pressure, does not require globe compression and wears off rapidly providing instant visual rehabilitation to the patient¹ Topical anaesthesia for cataract surgery can be administered with various anaesthetic drops and can be augmented with intracameral Lignocaine and oral or intravenous sedatives.²

Every patient with bilateral cataract being operated on first eye is a potential candidate for second eye surgery. The

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patient's return to the same surgeon and opting the same technique is dependent on the patient's overall experience of anxiety, pain, discomfort and success from the first procedure.

Many earlier studies have reported that patients experience more pain during their second surgery and many others have reported no difference in perceived pain between the two surgeries.^{3–6} While many other studies have reported no difference in perceived pain between the two surgeries.^{7–9} This observation is instrumental to the whole process of consent and perioperative management of the cataract patient during the second surgery. Most surgeons and paramedics would presume the patient to be well versed with the nuances of the procedure and rush through the exercise in a very casual way during the second surgery leaving an entirely unhappy patient and an even unhappy surgeon in the end.

Previous studies in this area have used various combinations of questionnaires, anxiety and pain rating scales and different combinations of the topical anaesthesia and its supplementation.

This study was proposed as a prospective observational single centre study with topical Proparacaine as the exclusive anaesthetic to evaluate and compare the perception of anxiety and pain in sequential phacoemulsification cataract surgery.

2. Materials and Methods

60 consecutive patients with bilateral cataract were invited to join the study after detailed consent and explanation of the purpose and process of the study. The study protocol was duly approved by institutional ethics committee and confirmed to the declaration of Helsinki. The sample size was calculated to at least find a difference of 1 on a 10 point VAS scale assuming a significance of 0.05 and standard deviation of 2.78 based on a similar previous study.¹⁰ Exclusion criteria included history of allergy to Proparacaine, hearing or intelligence problems, complicated cataracts, ocular comorbidities, comedication with anxiolytics or sedatives and drug or substance abuse.

All patients were examined by the operating surgeon for dilated refraction and slit lamp biomicroscopy for cataract grading by LOCS II classification and 90D fundus examinations. Preoperative anxiety was evaluated in the waiting room by a trained investigator, using a pre-validated numbered Visual Analog Scale (VAS) for anxiety presenting as a numbered line from 0 (NO anxiety/ distress) to 10 (Unbearable anxiety/distress).¹¹ Topical anaesthesia was achieved by instilling a drop of Proparacaine before cleaning and draping and another drop after insertion of lid speculum. All surgeries were performed by clear corneal Stop and Chop Phaco- emulsification and a foldable IOL was implanted. All eyes were closed with hydration of corneal section and intracameral injection of preservative

free Moxifloxacin.

Surgeon's assessment of patient cooperation was made at the end of the procedure using a 4-point scale with 0 (No cooperation/ excessive eye movements) to 3 (Excellent cooperation).⁸ Patient's pain perception was evaluated in the recovery room by same investigator, using VAS for pain presenting as numbered line from 0 (No pain) to 10 (Unbearable pain) modified with Wong -Baker faces pain rating scale.^{11,12} In addition to asking for overall comfort and satisfaction, after first surgery the patients were asked if they would prefer the same technique for their second eye surgery. After second surgery the patients were asked to compare their anxiety and pain perceptions between the two surgeries and if they would recommend the same technique for their relatives and general public.

Statistical analysis was done by SPSS 20. Paired observations like comparison of anxiety and pain VAS scores in the first and second surgeries using Wilcoxon signed rank test were done. Spearman rank correlations were used to study the correlation between the two score.

3. Results

All patients underwent successful surgeries with no incidence of allergy to the anaesthetic drug and no need for supplementation of anaesthesia or conversion to regional nerve block. No incidence of posterior capsular tear or vitreous loss occurred. The gap between the two surgeries ranged from 1 week to 60 weeks (Mean: 24.3 weeks and Median: 24 weeks).

Minimum age was 50 and maximum age was 80 years with mean age 59 years (SD 6.93). 39 (65%) patients were males and 21 (35%) patients were females. Mean surgical time in first surgery was 15.07 ± 1.76 (Mean \pm SD) minutes and 14.52 ± 2.28 minutes in second surgery and was not statistically significant with p value = 0.093. Mean Phacoemulsification time in first surgery was 18.35 ± 5.9 seconds and 17.45 ± 0.859 seconds in second surgery and was not statistically significant with p value = 0.254 (Table 1). Mean anxiety score was 3.15 ± 1.21 in first surgery (median 3, range 1-5) and 1.58 ± 0.89 in second surgery (median 2, range 0-4). Overall 49 (81%) patients gave more anxiety score to their first surgery against 11 (19%) patients giving more anxiety score to their second surgery and the difference was highly statistically significant with p value < 0.001 (Figure 1). Mean pain score for first surgery was 0.73 ± 0.86 (median 1, range 0-4) and 2.17 ± 0.90 (median 2, range 0-4) for second eye surgery. 51 (85%) patients gave more pain score to their second surgery as compared to 9 (15%) patients giving more pain score to their first surgery and the difference was highly statistically significant with p value < 0.001 (Figure 2). There was no statistically significant difference in the surgeon's score of patient cooperation between the two surgeries. All patients were comfortable and satisfied

with their surgical procedure and all first surgery patients recommended the same technique for their second surgery and all second surgery patients recommended the same technique for their relatives and general public.

Table 1:

Parameter	Value
Patients	60
Mean age ± SD	59±6.93
Gender: Male Female	39(65%) 21(35%)
Mean surgical time : First Surgery Second Surgery Paired	15.07±1.765 minutes 14.52±2.228 minutes
Difference p value	0.550±2.494 0.093
Mean Phacoemulsification time: First Surgery Second Surgery Paired	18.35±5.961 seconds 17.45±0.859 seconds
Difference p value	1.033±6.950 seconds 0.254

4. Discussion

In 2011 Ursea *et al* reported higher VAS pain score in 40% of their 65 patients for their second eye surgery. The median pain score was 0 (range 0-6) in first surgery and 1 (range 0-9) in second surgery with $p < 0.05$. They also observed APAIS (Amsterdam Preoperative Anxiety and Information Scale) and STAI (State- Trait Anxiety Scale) anxiety scores decreased between surgeries. Their findings are similar to our findings of rise in pain and fall in anxiety VAS scores between two eye surgeries. However their study differed from our study in that they used assisted anaesthesia with intravenous Midazolam, had short interval of 1-2 months between the surgeries, their cohort was racially heterogeneous and they used APAIS and STAI scores for anxiety.³

In 2011 Tan *et al* observed that patients having previous cataract surgery were likely to experience more pain in their second surgery, with 55% patients having more pain in second surgery as compared to 45% patients with more pain in first surgery, $p < 0.05$. This confirms to our findings. However their study was multicentre, operated by 4 surgeons and used topical Lignocaine gel and supplementation with intracameral Lignocaine whenever necessary.⁴

In 2015 Jiang *et al* observed that a significantly greater proportion of patients who had second eye surgery had more pain, with 85% reporting pain for second surgery as compared to 35% reporting pain in first surgery, $p < 0.05$. They also observed higher anxiety scores in patients undergoing first surgery as compared to second surgery $p < 0.05$ which is in conformity with our findings. Their study differed from our study in having unequal number of patients in the two surgery cohorts, using two different anxiety rating scales (STAI and VAS) and using lignocaine 2% gel as the anaesthetic drug.⁵

In 2015 Ji-guo Yu *et al* reported that 26% of their 127 patients reported more pain in first surgery, 41% patients reported more pain in second surgery and 27% patients felt no difference in pain, conforming to our results. However they observed no significant difference in anxiety scores between the surgeries. Their study differed from our methodology in its large sample size, using APAIS anxiety score and NRS (Numerical rating scale) pain score. They also examined subjective preoperative sensations like eye bulges and light sensitivity.⁶

In contrast, Sharma *et al* in 2008 observed no significant difference in pain ($p = 0.47$) and anxiety ($p = 0.37$) between first and second eye surgeries. Their surgery cohorts were dissimilar in numbers, were operated by different surgeons at different times and the questionnaires were answered by patients at home without assistance and supervision.⁷

In 2011 Bardocci *et al* found no significant difference in pain score between first and second surgeries (2.35 V/s 2.89). They used Lignocaine gel as anaesthetic and had a

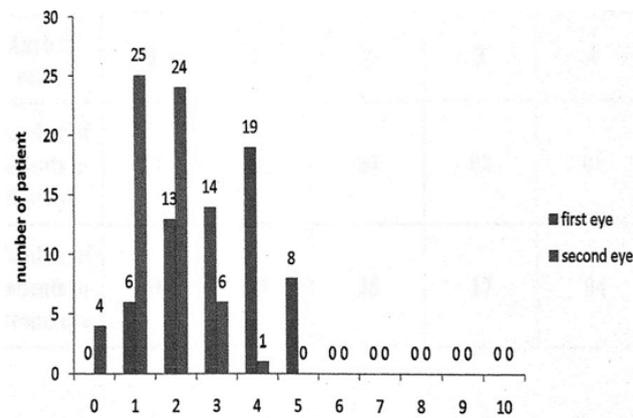


Fig. 1: Anxiety score comparison between first and second eye surgery p value < 0.001

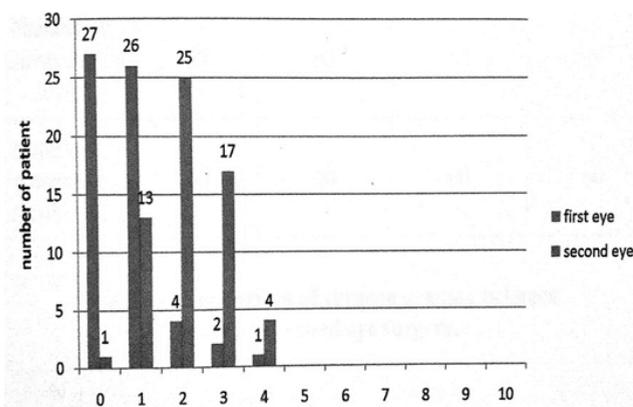


Fig. 2: Pain score comparison between first and second eye surgery p value < 0.001

3 year long duration of study. They also did not measure anxiety in their study.⁸

The strength of our study lies in its use of only Proparacaine drops for anaesthesia without any supplementation with anaesthetics or sedatives. The study had intra individual observations and no inter individual variations were seen as in dissimilar cohorts. All the cases were operated by the same surgeon. Subjective VAS scoring was assisted by the investigator which ensures correct comprehension by the patient. The limitations of this study lie in its small sample, large gap between surgeries which may induce memory bias and presence of investigator during the filling of VAS and other scores and questionnaires which may induce bias in the form of under reporting.

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5. Conclusion

We recommend that patients reporting for second eye cataract surgery must be exhaustively counseled preoperatively. They should be cautioned that the more relaxed they are for their second surgery, the more likely they are to feel any unexpected and heightened pain during their second surgery. Appropriate modifications should be done in the anaesthetic technique to suit the individual patient's level of stress, anxiety, pain and comfort. A tailor made anaesthetic regimen would always ensure a happy patient and an even happier surgeon, a win-win situation for all.

5.1. Disclaimer

The authors are alone responsible for the content and writing of this paper and have no financial interests associated with any products used in the study to declare. The authors have not received any financial grants to conduct the study.

6. Source of Funding

None.

7. Conflict of Interest

None.

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