

# AMBULATORY CATARACT SURGERY IN PUBLIC HEALTH SECTOR IN NWFP: A STUDY OF 302 CASES

Amanullah, Bakht Samar Khan, Mohammad Alam, Mohammad Daud Khan

Department of Ophthalmology, Agency Headquarter Hospital, Landi Kotal,  
Khyber Teaching Hospital, Khyber Institute of Ophthalmic Medical Sciences,  
Hayatabad Medical Complex, Peshawar

## ABSTRACT

**Objective:** To assess the feasibility, safety and cost effectiveness of ambulatory cataract surgery.

**Material and Methods:** This study was conducted on patients with age related cataract at Hayatabad Medical Complex from 1<sup>st</sup> January to 31<sup>st</sup> December 2000. Patients with unilateral cataract and pathological cataract were excluded from the study. Patients were either admitted to the hospital or were operated as day cases. Extra capsular cataract extraction with intra-ocular lens was done in all cases by two senior surgeons. Patients were observed peroperatively and postoperatively for complications, visual acuity and the comfort and difficulty they faced during the process.

**Results:** Out of 302 patients 175 (57.94%) males and 127(42.06%) females. 153 patients (50.67%) were operated as day cases and 149 patients (49.33%) were operated as indoor cases. Peroperative complications were noted in 8 (5.22%) day cases and 10 (6.71%) indoor cases. Postoperative complications were noted in 18 (11.29%) day cases and 12 (8.05%) indoor cases. Postoperative corrected visual acuity of 6/6 to 6/18 was found in 80 (93.02%) day cases and 73 (92.40%) indoor cases. An average of 84 (97.67%) day cases were satisfied with the process of intervention, visual outcome and cost of intervention while an average of 77 (97%) indoor cases were satisfied with the above mentioned aspects of surgery.

**Conclusion:** Ambulatory cataract surgery under optimal condition is safe, feasible and cost effective. The patient immediately returns to his/her home environment and avoids the physical and psychological stresses of the hospital environment.

**Key Words:** Ambulatory cataract surgery, Cost effectiveness.

## INTRODUCTION

The first mention in literature of out patient ophthalmic surgery was in 1886 when Julian Chisholm, Professor of Ophthalmology at the University of Maryland, wrote that his postoperative cataract patients walked back to their rooms, their movements were not restricted in any way and their dressings were dispensed with on the fifth or sixth day with good results.<sup>1</sup> Similar reports appeared in the literature by Dailey in 1928,<sup>2</sup> Smith in 1947,<sup>3</sup> Ching in 1958.<sup>4</sup> Christy in Taxila, Pakistan in 1960 published his epic report on the complications after 3000 cataract extractions.<sup>5</sup> One thousand patients were kept in bed for 8 days, another 1000 patients were kept in bed for 1 day; and a final group of 1000 patients walked from the operating table to their beds and

had no restriction on their activities. Of each group 94% of the patients obtained good visual results. Essentially no difference was noted in postoperative complications in the three groups.

Further reports appeared in the literature by Jevrey in 1961 and 1963<sup>6,7</sup> and Beard in 1967<sup>8</sup>. In 1970, the first surgical facility for out door ophthalmic surgery was opened by Douglas E. Williamson, in Venice, Florida.<sup>9</sup> Safety and efficacy of out patient cataract surgery was proven by Lambdenden in Senegal<sup>10</sup> and Kogura et al in Japan.<sup>11</sup> In 1973, Galin and Colleagues,<sup>12</sup> in a retrospective study involving 1000 patients, demonstrated that immediate ambulating and discharging after cataract extraction, without restrictions of any kind, yielded results exactly comparable to those obtained with inpatients

whose activities were severely restricted and who were hospitalized for up to 10 days. In 1975 Douglas reported on 1000 consecutive outpatient cataract extraction.<sup>13</sup> Maumenee<sup>14</sup> performed another series of 500 inpatients and 1000 outpatient cataract extractions. Both series were compared and it was found that the incidence of complications in both series was essentially the same. In August 1975 Draeger in Germany did 30 cataract operations on outdoor basis and he found no difference between the outdoor and indoor cases regarding postoperative complications. Wania of Karachi, Pakistan in 1981 reported that a comparison of 500 out patient cataract operations with 500 in patient cataract operations revealed similar results. The only difference he encountered was that the outpatient group was more pleased with the surgical experience.

In 1981 Galin in a randomized prospective study of 250 age matched cataract patients in New York City, found no significant difference in the ocular results as indoor and out door cases.

Khan MD in 1987<sup>15</sup> at Peshawar Pakistan in his study compared 768 indoor operated cataract patients with same number of outdoor operated cataract patients. He found no significant difference between the two groups for various surgical aspects. In fact outdoor operated were having less complications and better visual outcome than the indoor group.

This study was conducted to assess the feasibility, safety and cost effectiveness of ambulatory cataract surgery at Hayatabad Medical Complex.

**MATERIAL AND METHODS**

This study was carried out from 1<sup>st</sup> January 2000 to 31<sup>st</sup> December 2000. Patients were randomly selected from four outpatient rooms on different day from different OPD rooms. After selection of patients for surgery, they were fully assessed preoperatively for their ocular as well as systemic health. Regarding ocular examination, their visual acuity, general ocular examination regarding lid, eyelashes, conjunctiva, lacrimal sac and anterior segment were examined with slit lamp. Intra-ocular pressure was recorded with Goldmann applanation tonometer. Condition of cataract was assessed with direct ophthalmoscope and slit lamp examination. Fundus was examined with direct and indirect ophthalmoscope with dilated pupils whenever possible. Regarding systemic diseases, status of blood pressure and diabetes were particularly assessed.

Other systems of the body like cardiovascular system, gastrointestinal system and respiratory system etc were also assessed. Routine

laboratory investigations like hemoglobin %, urine and blood sugar estimation were performed preoperatively in the hospital laboratory.

Commonly available antibiotic drops (chloramphenicol) were used in each patient preoperatively. All patients selected for surgery were operated under local anesthesia. The surgical method employed in all the cases operated in this study was extra capsular cataract extraction with intraocular lens implantation. Two senior surgeons operated on all the patients for the purpose of uniformity of surgery through out the study. Postoperative medication Maxitrol eye drops (combination of Steroid + antibiotics) and tablet Brufen were used.

**RESULTS**

Total patients in this study were 302. Males were 175 (57.94%) and females were 127 (42.06%). Patients operated, as day cases were 153 (50.67%), while those operated as indoor were 149 (49.33%) (Table No. 1). Most of the patients presenting with cataract were in the age group of 51-70 years (225 out of 302 (74.5%)). Fifty-eight patients (19.20%) were between age group of 41-50 years while 19 patients (6.28%) were in the age group above 70 years (Table No. 2).

**AMBULATORY CATARACT SURGERY BASELINE CHARACTERISTICS**

Characteristics	Frequency (n=302)	% age
Males	175	57.94%
Females	127	42.06%
Patients operated as day cases	153	50.67%
Patients operated as indoor cases	149	49.33%

Table 1

Most of the patients suffered from mature cortical cataract i.e. 193 out of 302 (63.9%). Eighty-eight patients (29.13%) suffered from nuclear cataract while 21 patients (6.95%) suffered from posterior sub capsular cataract.

Regarding preoperative visual acuity, 241 (79.8%) patients presented with visual acuity <3/60 in the affected eye e.g. they were legally blind in the eye to be operated. Forty-two patients (13.9%) presented with visual acuity between 6/6-3/60 while 19 patients (6.29%) presented with acuity ranging between 6/18 to 6/60 (Table No. 3).

Three hundred patients including 151 (98.69% day cases and 149 (100%) indoor cases, attended the first day postoperative visit. Two patients among the day cases did not turn up for the first visit for unknown reasons. The number of patients presenting at first week postoperative visit was 226 out of 300 or (74.83%). Among a total of

**AGE-WISE DISTRIBUTION (n=302)**

Age Group	Day cases n=153 (50.67%)	Indoor cases n=149 (49.33%)	Percentage
40-49 yrs	26 (16.99%)	32 (21.47%)	58 (19.20%)
50-59 yrs	57 (37.25%)	60 (40.26%)	117 (38.74%)
60-69 yrs	60 (39.21%)	48 (32.21%)	108 (35.76%)
70-79 yrs	07 (04.57%)	08 (05.36%)	15 (04.96%)
80-89 yrs	03 (1.96%)	00 (00.00%)	03 (00.96%)
90-100 yrs	00 (00.00%)	01(00.67%)	01 (00.33%)

Table 2

153 day cases, 119 (77.77%) day cases attended the first week postoperative visit. 107 (71.78%) indoor cases among 149 total cases attended the first week postoperative visit. But the number of patients presenting at 6<sup>th</sup> week follow up was less (165 out of 300 or 54.63%). Eighty-six (56.20%) were day cases and 79 (53.02%) were indoor cases. Seventy-six patients (25.16%) were lost to the 1<sup>st</sup> week follow up among which 34 (22.22%) were day cases and 42 (28.18%) were indoor cases. One hundred and thirty nine patients (46.02%) were lost to the 6<sup>th</sup> week follow up among which 68 (44.44%) were day cases and 71 (47.65%) were indoor cases (Table No. 4).

Regarding peroperative complications, 18 (5.96%) out of 302 patients, suffered peroperative complications. Out of these 18 cases, 8 (5.22%) were day cases while 10 (6.71%) belonged to the indoor group. In 284 (94.03%) patients no peroperative complication occurred. This included 145 (94.77%) day cases and 139 (93.28%) indoor cases. Peroperative complications noted were vitreous loss, posterior capsule tear, subluxated lens, spontaneous hole in the posterior capsule, retrobulbar hemorrhage and thick posterior capsule. These complications were not serious and were managed quite easily peroperatively.

The postoperative complications noted were suture breakage, wound leak, severe reaction, striate keratitis, endophthalmitis, irregular pupils and iris prolapses. In postoperative complications, 30 (10%) out of 300 patients suffered postoperative complications. Out of these 30 patients, 18 (11.92%) were day cases while 12 (8.05%) were indoor cases. Thus 270 patients

(90%) were free of postoperative complications among which day cases were 135 (89.4%) and indoor cases were 137 (91.94%). Two patients with postoperative endophthalmitis with a visual acuity of light perception in the affected eye were admitted to the hospital and were given full treatment. The result of full treatment of endophthalmitis was very rewarding. The patient operated as outdoor improved a lot and he was having a corrected visual acuity of 6/24 on discharge. The patient operated as indoor also responded to the treatment but not significantly and was having a corrected visually acuity of count finger one meter on discharge. The patient with iris prolapse in first week follow up was called again as a day case and the iris was repositioned with wound closure in the main operation theatre. This patient gave a history of a long journey (hours) by bus before the problem occurred in the operated eye. Regarding postoperative complications most of them were mild and required no surgical or other interventions (in 26/30 or 90%). Only four patients (10%) with postoperative complications needed modified medical or surgical intervention.

After correcting the visual acuity of the patients at 6<sup>th</sup> week follow up, the number of patients with visual acuity of 6/6 6/18 (normal) went up to 153 out of 165 (92.72%). Among these 80 (93.02%) were day cases and 73 (92.40%) as indoor cases. Only 11 patients (6.66%) were having visual acuity of < 6/18 to 6/60 (impaired). Six (6.96%) were day cases and 5 (6.32%) were indoor cases. One patient of indoor group was having a visual acuity of < 3/60 (blind legally). (Table No. 5).

**PREOPERATIVE VISUAL ACUITY OF THE EYE TO BE OPERATED (n=302)**

Visual Acuity	Day cases n=153 (50.67%)	Indoor cases n=149 (49.33%)	Total n=302	P-Value
< 3/60	122 (97.73%)	119 (79.86%)	241 (79.80%)	P > 0.05
6/60-3/60	19 (12.41%)	23 (15.43%)	42 (13.90%)	P > 0.05
6/18-6/60	12 (07.84%)	07 (04.69%)	19 (06.29%)	P < 0.05

Table 3

**AMBULATORY CATARACT  
SURGERY FOLLOW UP OF THE PATIENTS (n=302)**

Visit	Day cases n=153 (50.67%)	Indoor cases n=149 (49.33%)	Total	P-Value
First day	151 (98.69%)	149 (1.00%)	300 (99.33%)	P > 0.05
First Week	119 (77.77%)	107 (71.81%)	226 (74.83%)	P > 0.05
Six Week	86 (56.20%)	79 (53.02%)	165 (54.63%)	P > 0.05
Lost to 1st Week Follow up	34 (22.22%)	42 (28.18%)	76 (25.16%)	P > 0.05
Lost to Sixth Week Follow up	68 (44.44%)	71 (47.65%)	139 (46.02%)	P > 0.05

Table 4

Refractive error was the main cause for low vision postoperatively (32 or 19.39%) at 6<sup>th</sup> week follow up. Sixteen (18.60%) were day cases and 16 (20.25%) were indoor cases (Table No. 06). Other causes for low vision were posterior capsular thickening, vitreous loss and endophthalmitis (11 or 6.65%).

Out of 165 cases at the end of 6<sup>th</sup> week of follow-up, majority of the patients (>98%) in both groups were satisfied with the process of intervention, the cost of intervention and the visual outcome of the intervention (Table No. 6).

**DISCUSSION**

In our study male patients were 175 (57.94%) while female were 127 (42.06%). This finding is similar to the study done by Parul Desai et al<sup>16</sup> in which 53% patients were male and 47% female. In another study by GP Pokharel et al<sup>17</sup> female patients were 59.1% while male 40.9%.

Most of the patients with cataract were between the age group 51-70 year (225/302 or 74.50%). This closely corresponds to the study done by GP Pokharel et al<sup>17</sup> in which 92% of patients with cataract fell between age group of 50 to 70 years. In another study done by Parul Desai et al<sup>16</sup> the mean age of the patients with cataract was 76.3 years (74.03% in men and 77.3% in women).

Diabetes and hypertension were the two

major associated systemic diseases (22.50% of the total 24.50%). This finding correlates with the finding of Parul Desai et al<sup>16</sup> in which also the diabetes and hypertension were the most common associated systemic diseases (40% of the total 57%). Diabetes and hypertension were two most important associated systemic diseases in an other study held in Pakistan by Hussain M et al<sup>18</sup> in which the frequency of diabetes was 21% while hypertension as 13%, as compared to 10.59% diabetes and 11.91% hypertensive in this study. The difference may be due to the fact that we excluded diabetic patients from the study with advanced diabetic retinopathy interfering with postoperative visual outcome.

Most of the patients suffered from cortical type of cataract (63.90%) followed by nuclear cataract (29.13%) and posterior subcapsular (6.95%). This finding is supported by the study of Belpoliti-M et al<sup>19</sup> in which cortical cataract was the most prevalent type of age related cataract followed by nuclear and then posterior sub capsular type.

Most of the patients (93.6%) were having a pre operative visual acuity of less than 6/60 in the eye to be operated with 79% legal blindness (less than 3/60). Some patients (6.29%) were having a visual acuity of 6/18 to 6/60. This finding is similar to the study done by Zhao J et al<sup>20</sup> in which most of the patients were having a preoperative visual acuity of less than 6/60, while

**POSTOPERATIVE CORRECTED VISUAL ACUITY  
AT 6TH WEEK FOLLOW UP (n=165)**

Visual Acuity	Day cases n=153	Indoor cases n=149	Total n=392	P-Value
6/6-6/18	80 (93.02%)	73 (92.40%)	153 (92.72%)	P > 0.05
<6/18-6/60	06 (06.96%)	05 (06.32%)	11 (06.66%)	P > 0.05
< 3/60	00 (00.00%)	01(01.26%)	01 (00.60%)	P > 0.05
Total	86 (56.20%)	79 (53.02%)	165 (54.6%)	

Table 5

**NUMBER OF PATIENTS SATISFIED  
AT 6TH WEEK FOLLOWS UP (n=165/302)**

About	Day cases n= 86/153 (56.20%)	Indoor cases n= 79/149 (53.02%)	Total n= 165	P-Value
Process of intervention	86 (100%)	79 (100%)	165 (100%)	P > 0.05
Intervention	85 (98.83%)	78 (98.73%)	163 (98.8%)	P > 0.05
Visual outcome	81 (94.18%)	74 (93.67%)	155 (93.9%)	P > 0.05
Cost of intervention	84 (97.67%)	76 (96.20%)	160 (96.97%)	P > 0.05

Table 6

the rest were having a visual acuity 6/60 6/18 and some with 6/12. In similar studies done in India and Pakistan<sup>21,22</sup> more than 80% patients were also legally blind in the eyes to be operated. This preoperative visual status revealed the prevalent trend in our part of the world of delaying cataract surgery till vision is reduced to functional blindness.

The results of postoperative visual outcome and complications are very much comparable to the study conducted at Jules Stein Eye Institute, Los Angeles, California.<sup>23</sup> Corrected visual acuity at final visit in this study is in the range of 6/6 to 6/18 in 92.72% patients (92.4% indoor, 93.02% day cases) as compared to 85% in total patients in the above-mentioned study (84% indoor, 86.7% day cases). It was in the range of 6/18 to 6/60 in 6.66% of total patients (6.32% indoor, 6.96% day cases). In this study and was 12.2% of total patients in the above-mentioned study (13.00% indoor, 11.3% day cases). Corrected visual acuity of < 6/60 was found in 0.60% of total patients (1.26% indoor, 0.00% day cases) in this study in comparison to 2.5% in total patients in the above mentioned study (3.00% indoor, 2.00% day cases).

The postoperative corrected visual acuity of this study also corresponds to an other study inducted in India<sup>21</sup> which shows the operative visual acuity of 6/6 to 6/18 in 87.9% cases. Visual acuity of < 6/18 to 6/60 was found in 10.2% cases while in 1.9% cases it was < 6/60 to 3/60. Looking at the complications in both studies, the factors contributing to the differences are study period, which was 3 years in the above study and 1 year in this study. The final visit was made at 6<sup>th</sup> month period postoperative in the above study, while it was at 6th week in our study. Total number of patients operated was 600 in the above-mentioned study and 302 in our study. Four ophthalmologists operated on patients in above study while in our study 2 ophthalmologists operated on patients.

Complication rates in our study are also comparable and compatible. Posterior capsular tear with vitreous loss was found to be 3.96% in total patients (4.02% indoor cases, 3.0% day cases). It is 2.2 % in total patients (2.2% indoor, 2.00% day cases) in the study conducted at Jules Stien Institute, which is a bit lower rate as compared to our study. Wound dehiscence in the above mentioned study is nil. It was 0.33% in total patients (0.0% indoor, 0.67% day cases) in this study. It may be pertinent to mention that the study mentioned was very large.

Regarding postoperative endophthalmitis, the rate in this study was 0.66% (0.65% day cases, 0.67% indoor) which is higher as compared to other studies done by Javtt, Katlan and Jaffe<sup>24,25,26</sup> where it was reported to be 0.33%. In an other series of studies held in Pakistan, postoperative endophthalmitis rate was a bit higher 1.17%<sup>27</sup> and 1%<sup>28</sup> as compared to 0.66% in this study.

The possible reasons for higher rate of postoperative endophthalmitis in this study as compared to the international studies were poverty, ignorance, poor general and ocular hygiene. Although we asked patients to clean their eyes thoroughly post operatively, we observed that in spite of this most patients did not clean their eyes regularly due to the false belief that manipulation of any kind may result in loss of vision or loss of eye.

The factors responsible for late presentation to the treatment centers were difficult accessibility, traveling inconvenience, poor financial status and the most important one the small number of centers with ophthalmic facilities. Similar factors have been described by M. Naseem Panezai in his study done at Quetta Pakistan.<sup>28</sup>

Most of the patients were satisfied with different aspects of day case surgery (100% with the process of intervention, 94% with visual outcome, 97.67%, with cost of intervention). This finding is supported by Noon and Davero<sup>29</sup> who

reported a high degree of satisfaction with ambulatory surgery, quality of nursing care, patients teaching and the convenience of care. Gamotis et al<sup>30</sup> have reported an overall satisfaction with technical and professional trusting of ambulatory surgical care. Clyne and Jamieson<sup>31</sup> similarly reported higher degree of patient satisfaction with the operative procedures in ambulatory surgery.

Pica Furey<sup>32</sup> evaluated both indoor and outdoor operated patients for their satisfaction, with nurses, nursing care and overall cost and convenience. He found that day case patients were more satisfied with the above-mentioned aspects of care. He found no significant differences between the two groups. Out door patients were more satisfied with the cost of medical care than indoor group. Same was the outcome in the study done by Pineault.<sup>33</sup>

## CONCLUSION

Day cataract surgery is as safe as indoor surgery, compared to inpatient, out patient surgery is very cost effective both for the hospital and patients.

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**Address for Correspondence:**

**Dr. Amanullah**

Department of Ophthalmology,  
Agency Headquarter Hospital,  
Landi Kotal.