

## **INTRAOPERATIVE COMPLICATIONS OF CATARACT**

### **SURGERY IN AL-SADDER MEDICAL CITY**

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**ABSTRACT:**

**Background:** Cataracts surgeries consider a common ophthalmic operation, and there are many types of these operations, and each operation has specific steps.

**Purpose:** To recognize most common and dangerous intraoperative complications in cataracts surgery. To recognize risk factors leading to this complication before surgery. To study best methods to prevent this complication, and their management if happen.

**Methods:** 360 patients were collected from Sep.2011-Sep.2012 who came to ophthalmic outpatient's clinic, and privet clinic. On day of operation report any abnormal events in cataract surgery. Three surgeons' lists were recorded.

**Results:** The study sample consisted of 360 patients with cataract surgery, done in al- sadder medical city chosen from three specialists' operation list between sep.2011-sep 2012. The

results showed that 195 were males and 165 were females, 97 of the operations were done by Specialist doctors, 149 by the resident doctors and the rest by both. There are two type of cataract surgery (ECCE.+PHACO.) about 50 patients suffer from one or more type of complications.in my study rupture posterior capsule happen in about 17 cases (4.7%)

**Conclusion:** intraoperative complication my occur in best centers but the advice how to recognize there before occurrence, and if occur fined the best way to give good visual outcome.

**Keywords:** cataract, Retrobulbar hemorrhages, uveitis, I.O.L implantation, ophthalmic

### **INTRODUCTION:**

The normal lens is transparent. Any congenital or acquired opacity in the lens Capsule and/ or substance. Irrespective of the effect on vision is a cataract [1]. Cataracts classification: I. Acquired cataract: A. age related: 1.Subcapsular either anterior or posterior. 2.Nuclear cataract. 3.Cortical cataract. 4.Christmas tree cataract. B. Cataract in systemic diseases: 1.DM. 2.Myotonic dystrophy. 3.Atopic dermatitis. 4.Neurofibromatosis type 2. C. Secondary cataract: 1.Chronic anterior uveitis. 2.Acute congestive angle closure. 3.High myopi. 4.Hereditry fundus dystrophies. II. Congenital cataract [1]. The only definitive treatment of different type of cataracts is surgery.

There are three main types of cataract surgery: 1.Phacoemulsification (Phaco) is the preferred method in most cases [2]. 2.Conventional extracapsular cataract extraction (ECCE) [3].

The rate of cataract extraction increased continuously with increasing age and was greater among females than males in the older age group [4]. Cataract extraction is often recommended to patients for visual rehabilitation, however, it may also be recommended when lens opacity prevents adequate diagnosis and treatment of retinal diseases , in such cases , either determining eligibility for laser therapy or performance of laser therapy and retinal surgery may be impossible [5]. Phacoemulsification: Increased safety, rapid visual rehabilitation, and maximal subject comfort have been important factors in the development of modern surgical technologies and techniques for cataract extraction [6].

At a conservative estimate, at least 25% (or 1.5 million) of the six million cataract operations performed annually in developing countries will have poor outcomes. About one quarter of these poor outcomes are due to surgical complications. Over 375,000 people can therefore suffer permanent visual impairment every year as a result of surgical complications [7, 8, 9].

The complication of surgery listed below:

- Retrobulbar hemorrhages [2, 10].
- Superior rectus muscle laceration and/or haematoma [11].
- Localized choroidal hemorrhage, retinal detachment or hypotony, vitreous haemorrhage [11].
- Descemet's membrane detachment [12].
- Shallow or Flat Anterior Chamber [2].
- Iris prolapse [11].
- The creation of unequal capsular flaps [12].
- Rhexis escape [12].
- Zonular dialysis [13].
- Premature prolapse of the nucleus [14]
- Eccentric rhexis
- Decentration of the IOL [10]
- Difficulty in capsulorrhexis, hydro procedures, nucleus prolapse and delivery, cortical clean
- IOL implantation.
- Pseudoexfoliation, senile miosis, uveitis with posterior synechiae [12].
- Posterior synechiolysis [12].
- Iris cut to the pupil [12]
- Intraoperative miosis
- Vitreous loss
- Zonular dehiscence
- Tears of the posterior capsule [15, 18]
- Inadvertent iridodialysis.
- Positive vitreous pressure
- Inadvertent sulcus placement.
- Astigmatism.
- Posterior dislocation of the IOL [12].
- Fractures of the optic or haptics of acrylic IOLs [16,17].
- Suprachoroidal Hemorrhage or Effusion

- Expulsive Suprachoroidal Hemorrhage
- Retained Lens Material

The cataract surgery is most common types of ophthalmic operations. And there are many types of cataract operations, each one have many different steps, the purpose of my study to know most common type of complications, most common causes leading to this complications and best methods to prevent this complications.

**Methods:**

A total of 360 patients were included in this study on which the extraction of cataract was performed with or without I.O.L implantation of different ages , sex , etiology of cataract over the period from Sep.2011– Sep.2012. These operations were done by three specialist ophthalmic surgeons. The patients in my study collected randomly from outpatient clinic in addition to private clinic that already have date for cataract operations. On admission general medical and ophthalmological history review was carried out D.M, thyroid diseases, skin diseases allergy, corneal diseases ,dry eye occupation, prolong drug use as topical steroid, aspirin. All patients underwent same examinations including V\A for distant with and without glasses, refraction, IOP, slit lamp Ex. Of lids Conjunctiva, cornea, AC, posterior segment.

At the time of operation, the method of cataract extraction (Ecce or PHACO.) together with the type of anesthesia. The type of operative complication will report in detail and also steps of this complication in addition the possible causes leading to this complication wither related to patients condition, Surgeons, and instruments. We know that, there is a lot of intra-operative complication some of it very common but not risky on outcome, and some are very rare but devastating and leading to poor visual outcome, and sometime lead to visual loss. Some risk factors related to patients cannot correct so need special circumstances to prevent it. And others related to surgeons can be corrected too close supervision of experience doctors.

**Results:**

The study sample consisted of 360 patients with cataract surgery, all doing in Al-sadder medical in Al-Najaf Al-Ashraf city by three specialists from Sep. 2011-sep 2012. the results showed that 195 (54.2%) were males and 165 (45.8%) were females, the age range from 97

(2-99) with mean and standard deviation of (59.8±12.7), 340 patients above 40 years of age and only 20 patients below 40 years. 97 (26.9%) of the operations were done by specialist doctors, 149(41.4%) by the resident doctors and the rest 114(31.7%) by both specialist and resident doctors. There here tow type of cataract surgery (ECCE.+PHACO.) about 50 patients suffered from one or more type of complications.in my study rupture posterior capsule occurred in about 17 cases(4.7%).and other type of complication shown in table tow.

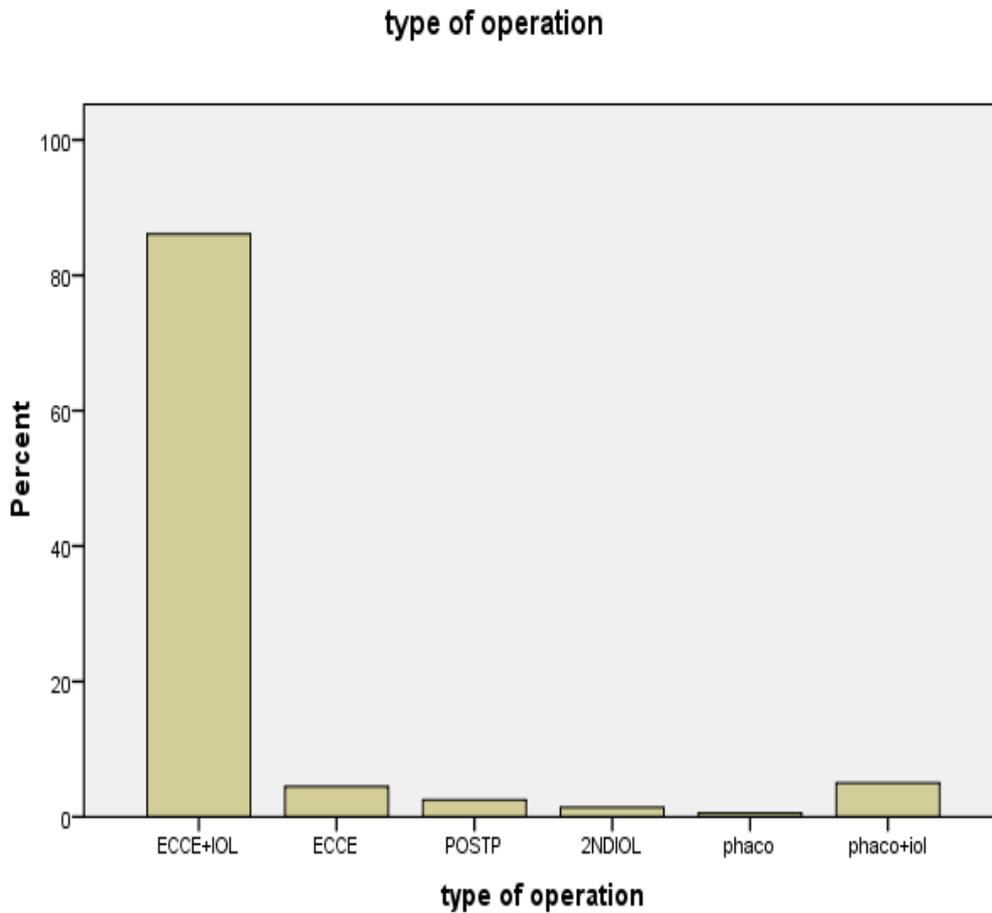


**Figure 1: Distribution of operations according to surgeon**

The types of operations according to their frequencies are shown in the table 1:

**Table 1: Operation types frequency table**

Type	No.	%
<b>EccE+IOL</b>	<b>310</b>	<b>86.1</b>
<b>EccE</b>	<b>16</b>	<b>4.4</b>
<b>Postponed</b>	<b>9</b>	<b>2.5</b>
<b>2<sup>nd</sup> IOL</b>	<b>5</b>	<b>1.4</b>
<b>PHACO.</b>	<b>2</b>	<b>.6</b>
<b>PHACO.+IOL</b>	<b>18</b>	<b>5.0</b>
<b>Total</b>	<b>360</b>	<b>100.0</b>



**Figure 2: Type of operation**

Fifty patients (13.9%) developed intraoperative complications, the types of complication according to their frequency is shown in table 2

**Table 2: Type of complication frequency table**

Type	No.	%	%total
<b>Rupture posterior capsule +vitreous loss</b>	<b>17</b>	<b>34</b>	<b>4.7</b>
<b>Retrobulbar hemorrhage</b>	<b>9</b>	<b>18</b>	<b>2.5</b>
<b>Failure of dilation</b>	<b>6</b>	<b>12</b>	<b>1.6</b>
<b>Iris prolapse</b>	<b>5</b>	<b>10</b>	<b>1.3</b>
<b>Shallow AC</b>	<b>4</b>	<b>8</b>	<b>1.1</b>
<b>Retained lens material</b>	<b>4</b>	<b>8</b>	<b>1.1</b>

<b>Difficult implantation</b>	<b>2</b>	<b>4</b>	<b>0.55</b>
<b>Floppy iris</b>	<b>1</b>	<b>2</b>	<b>0.27</b>
<b>Subluxated lens</b>	<b>1</b>	<b>2</b>	<b>0.27</b>
<b>Suprachoroidal hemorrhage</b>	<b>1</b>	<b>2</b>	<b>0.27</b>
<b>Total</b>	<b>50</b>	<b>100</b>	<b>13.9</b>

**Table 3: Percentage of causes of RPC+vitrous loss**

<b>Cause</b>	<b>No.</b>	<b>%</b>
<b>During delivery</b>	<b>4</b>	<b>23.5</b>
<b>During wash</b>	<b>7</b>	<b>41.1</b>
<b>Pushing</b>	<b>2</b>	<b>11.9</b>
<b>During implant</b>	<b>4</b>	<b>23.5</b>
<b>Total</b>	<b>17</b>	<b>100</b>

Twenty five complications (15.3%) occurred in 60-69 years with no significant statistical association ( $\chi^2= 1.95$ ,  $df= 4$ ,  $p= 0.9$ ) as shown in table 4

**Table 4: Association bet. Complication and age**

<b>Age (years)</b>	<b>complication</b>		<b>Total</b>
	<b>Yes</b>	<b>No</b>	
<b>&lt; 40</b>	<b>1</b>	<b>19</b>	<b>20</b>
<b>40-49</b>	<b>4</b>	<b>32</b>	<b>36</b>
<b>50-59</b>	<b>8</b>	<b>53</b>	<b>61</b>
<b>60-69</b>	<b>25</b>	<b>138</b>	<b>163</b>
<b>≥ 70</b>	<b>12</b>	<b>68</b>	<b>80</b>
<b>Total</b>	<b>50</b>	<b>310</b>	<b>360</b>

There was no significant statistical association between the mean age of those with complications and those without complications( $t=0.67,df=358, p=0.5$ ) as shown in the table 8

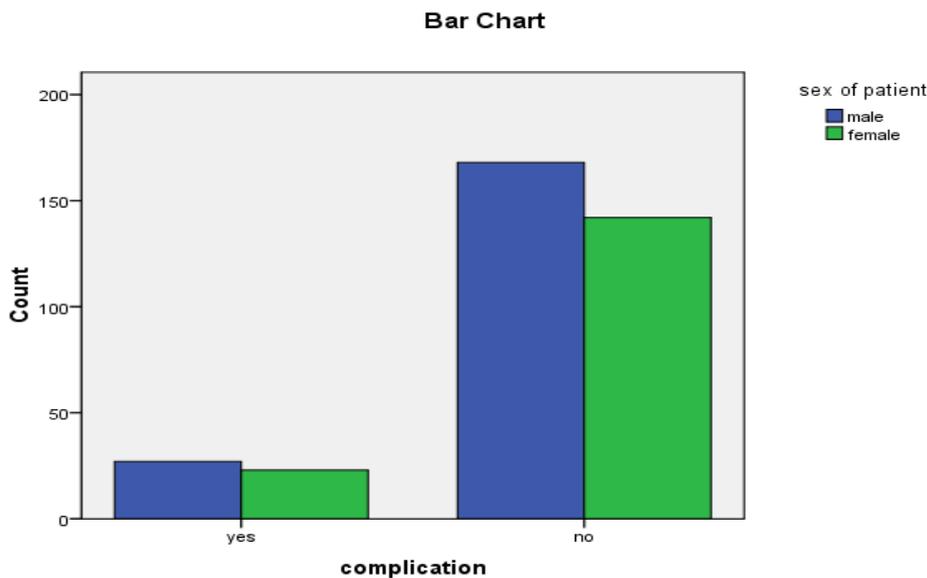
**Table 8: Association between complication and age of patient**

complication		N	mean	Std. Deviation	Std. Error Mean
age of patient	Yes	50	60.96	9.422	1.332
	No	310	59.66	13.169	.748

There was no significant statistical association between the sex of the patient and the complication ( $\chi^2=0.001$ ,  $df=1$ ,  $p$  value= $0.98$ ) as shown in table 5

**Table 5: Association between complication and sex of patient**

		sex of patient		Total
		male	female	
complication	yes	27	23	50
	no	168	142	310
Total		195	165	360

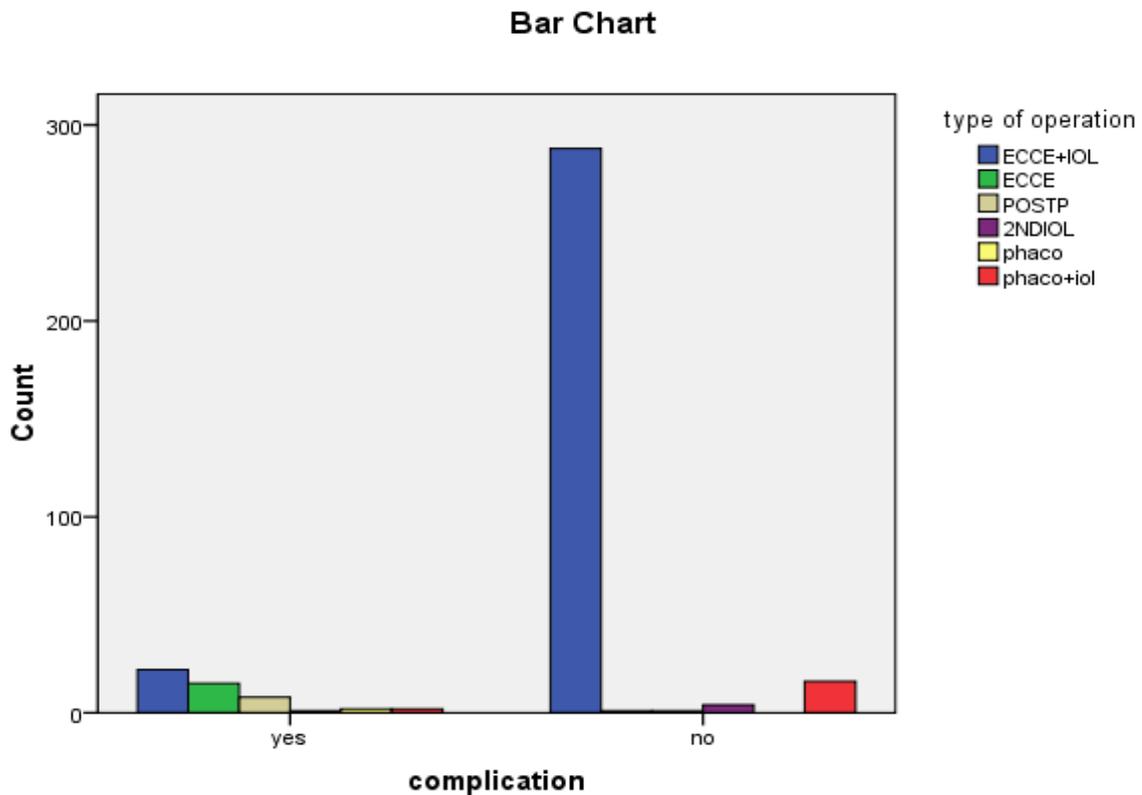


**Figure 3: Association between complication and sex of patient**

On the other hand there was significant statistical association between the type of the operation and the complication ( $\chi^2=152.28$ ,  $df=3$ ,  $p \text{ value}<0.001$ ) as shown in table 6.

**Table 6: Association between complication and type of operation**

		Type of operation						Total
		EccE +IOL	EccE	Postop.	2 <sup>nd</sup> IOL	Phaco.	Phaco +IOL	
Complication	Yes	22	15	8	1	2	2	50
	No	288	1	1	4	0	16	310
Total		310	16	9	5	2	18	360



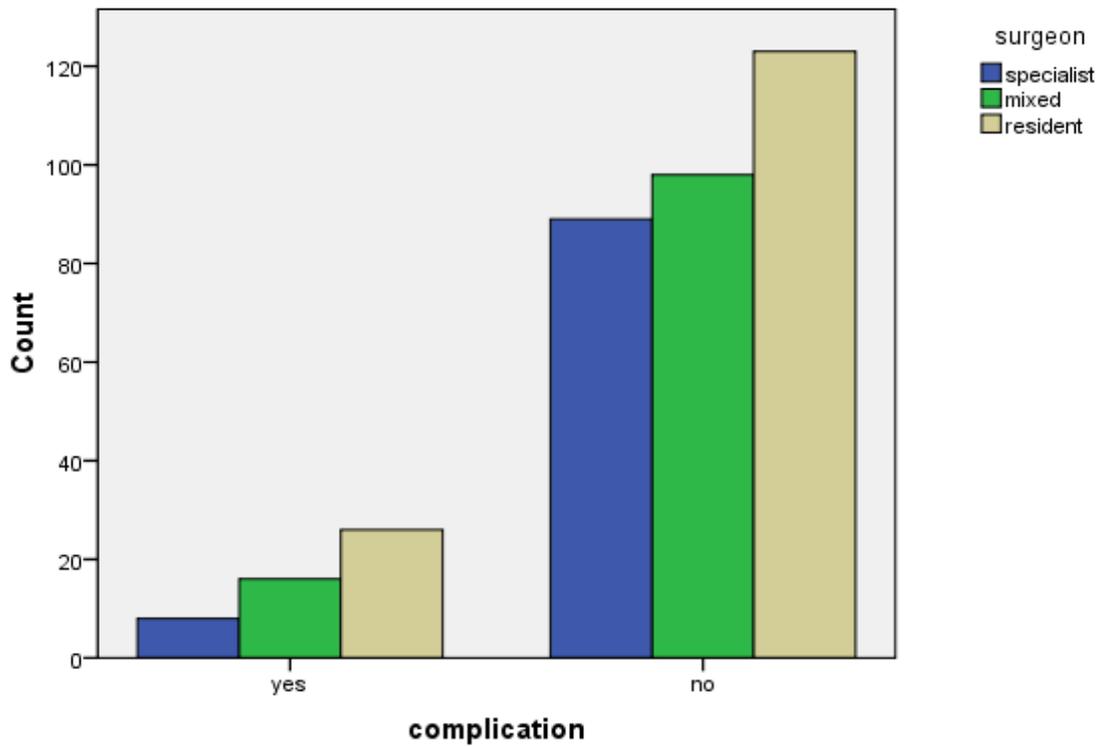
**Figure 4: Association between complication and type of operation**

There was no significant statistical association between the surgeon and the complication ( $\chi^2=4.16$ ,  $df=2$ ,  $p \text{ value}=0.125$ ) as shown in table 7.

**Table 7: Association between complication and surgeon**

		surgeon			Total
		specialist	mixed	resident	
complication	yes	8	16	26	50
	no	89	98	123	310
Total		79	114	149	360

**Bar Chart**



**Figure5: Association between complication and surgeon**

**Discussion**

We know that certain eyes are more likely to suffer complications than others. It is therefore very important to detect these conditions before surgery. For example, eyes with endothelial dystrophy (such as Fuch's dystrophy and corneal dystrophy), pseudo exfoliation, mature cataracts, or high ametropia (>6 diopters of myopia or hypermetropia) are all at greater risk.

It is important to collect data in order to identify patients at risk and to monitor their management before and after surgery. Even where the incidence of Complications is low, regular collection of data helps to identify high-risk patients and to confirm that they are being managed appropriately. Monitoring of cataract surgical outcomes is associated with a reduction in the incidence of surgical complications [19]. Some risk factors are intrinsic to the patient and, short of avoiding surgery altogether, very little can be done to eliminate them. However, in the event of surgery, high-risk cases should be operated on in an appropriate setting, by a surgeon who has the right level of experience. It has been shown that surgery carried out in eye camps, or by an inexperienced trainee, is more likely to result in complications than surgery undertaken in hospital by an experienced surgeon.

Therefore, if patients with high-risk eyes are identified, they should be operated on by a fully trained surgeon, preferably in a base hospital.

Although intrinsic risk factors cannot be avoided, other factors which may increase the risk of surgical complications are related to the delivery of the surgery. These latter risks can, and should, be modified. Much can be done before and during surgery to reduce the rate of complications. In this study: Fifty patients (13.9%) developed intraoperative complications, the types of complication according to their frequency is shown in table:

**Table: type of complication frequency table**

Type	No.	%	UKNCS %	AOOPP%	BJO%
Rupture posterior capsule +vitreous loss(RPC)	17	4.7	4.4	3.1	4.4
Retrobulbar hemorrhage	9	2.5			
Failure of dilation	6	1.6			
Iris prolapse	5	1.3	0.25	0.6	0.1
Shallow AC	4	1.1			
Retained lens material	4	1.1			
Difficult implantation	2	0.55			
Floppy iris	1	0.27			
Subluxated lens	1	0.27			

Suprachoroidal hemorrhage	<b>1</b>	<b>0.27</b>	<b>0.1</b>	<b>0.3</b>	<b>0.1</b>
Total	<b>50</b>	<b>13.9</b>			

*UK NCS= UK National Cataract Survey (Desai 99)*  
*AAO PPP= American Academy of Ophthalmology Preferred Practice Pattern (AAO 01)[21],*  
*BJO =British journal of ophthalmology*

Not every patient who suffers capsular rupture and vitreous loss experiences a poor outcome. If the complication is managed well, it is possible for the patient to retain excellent vision. R. PC. happen 7 patients during wash, and other during implantation and delivery.

Twenty five complications (15.3%) occurred in 60-69 years with no significant statistical association ( $\chi^2= 1.95$ ,  $df= 4$ ,  $p= 0.9$ ),other study shown increase incident of complication in elderly patients.

There was no significant statistical association between the sex of the patient and the complication ( $\chi^2=0.001$ ,  $df=1$ ,  $p$  value= $0.98$ ) ,other study shown the females more prone to suffer one of intraoperative complication.

On the other hand there was significant statistical association between the type of the operation and the complication ( $\chi^2=152.28$ ,  $df=3$ ,  $p$  value $<0.001$ ),so more complication happen in EccE+IOL.

There was no significant statistical association between the surgeon and the complication ( $\chi^2=4.16$ ,  $df=2$ ,  $p$  value= $0.125$ ),this mean close contact between specialist surgeons and residents doctor.

No eye clinic should be using phacoemulsification unless they have identified a facility to which they can refer patients for vitrectomy and fragmentation of a retained nucleus.

As phacoemulsification becomes more common in low- and middle-income countries, the number of dropped nuclei will also increase. Dislocation of fragments of the lens nucleus into the vitreous occurs in approximately 0.3% of phacoemulsification operations. The incidence may be higher in low- and middle-income countries, where dense cataracts and pseudoexfoliation are more common [20].

The management of complications needs to be incorporated into training programs. For example, management of vitreous loss, like every other surgical skill, can only be learnt by practicing under the supervision of a more experienced surgeon [21]. However, although

vitreous loss is most likely to occur while the surgeon is inexperienced, when it does occur, the trainer will usually take over.

**Conclusions:**

This means that, in some developed countries, ophthalmologists may do a few hundred cataract operations during their training, but will only manage vitreous loss two or three times. Our training programs rightly emphasize the avoidance of complications in cataract surgery. However, we need a greater emphasis on the correct management of these complications when they do occur, as they inevitably will. No trainee is truly competent to operate on cataract patients independently unless, for example, they are also competent in the management of vitreous loss.

1. Regular, frequent supervised training of cataract surgery involve teamwork and discussion before the operating theatre is even entered. Outline what the trainee can expect before the surgery is a good way of relieving the pressure on the trainer.
2. Regular use of a 'wet lab' is beneficial
3. Trainees must be supervised by an experienced surgeon
4. Training should be structured (i.e. modular) and planned
5. Patients should be aware that a trainee may be operating upon them but also be reassured that a trainee will not be allowed to operate unless they are safe.
6. Complications may still occur but will be less likely as trainees will have a basic set of skills and knowledge and will be supervised as appropriate.

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**Self**

**Conflict of interesting**

**None**

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