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Complications in Cataract Surgery

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CATARACT is one of the commonest ophthalmic conditions and every ophthalmic surgeon is interested in cataract surgery. Cataract surgery today has made considerable advancement and patients having this disability have excellent chance of regaining good vision following surgery. Most of us however do occasionally have problems and I hope these remarks which refer to senile cataracts would be of some assistance in coping with some of the problems.

The main objective in cataract surgery is to give the patient the best possible visual result, a comfortable post-operative period and the minimum of complications. A perfect anatomical result should be a secondary consideration, although one should try to achieve a good anatomical result with a central circular pupil.

1. Wound Closure

Adequate wound closure is essential and can be achieved by the placing radially three to five buried corneo-scleral sutures of eight 0 or ten 0 thickness. If the sutures are of ten '0' thickness, then five sutures should be placed as ten '0' sutures being very fine tend to cut out or break. One of these sutures, at least, must be preplaced. The anterior chamber should be reformed with Ringer's solution or saline and not air, as this is not only more physiological but also a good test of wound closure, for the anterior chamber is more difficult to reform with saline if the wound is not adequately closed. Early ambulation is then possible and desirable with the patient sitting up the same day and moving about the next day and if all is well, I discharge them 48 hours after surgery.

2. Haemorrhage

a. **Haemorrhage at Surgery:** In the tropics most eyes are pink and generally have a mild pannus so that the section usually tends to ooze blood. Therefore as a routine procedure light cautery of the superficial episcleral and scleral vessels running into the cornea is very helpful and is done after dissecting the conjunctival flap, before making the section.

Haemorrhage from the section can lead to the formation of fibrin clots adherent between the wound and the upper half of the iris. These fibrin clots tend to draw the pupil upwards into the section and this can be best prevented by cauterising the superficial scleral vessels at the limbus so that the bleeding is prevented.

Iris bleeding from one of the iris vessels, when its root is torn, can be troublesome. It is best to wait a few minutes for the bleeding to stop, then irrigate the AC and remove clots with Arruga's forceps before proceeding with the extraction of the lens.

b. **Post-Operative Haemorrhage:** Hyphaema is generally is due to excessive movement or direct trauma to the eye and occurs usually around the fifth day and is associated with pain. Fortunately most resolve well by keeping the patient in bed and padding both the eyes for 48 hours and one could also give Vitamins C and K. The intra-ocular pressure is rarely raised and settles well with diamox. One very rarely has to do a paracentesis and wash out the anterior chamber of blood clots but if the eye remains painful in spite of diamox and the blood

does not show a level in 48 hours it is best to do a paracentesis and evacuate some blood through keratome corneal incision, within the limbus and from the temporal side. Diabetes, hypertension and blood diseases must also be looked for and treated.

3. **Vitreous Loss**

Vitreous loss is a serious complication which must be avoided. It should be anticipated when there is evidence of positive pressure within the eye. One should be very careful if the wound tends to gape after making the section, especially if there is a horizontal corneal fold or the iris tends to prolapse into the wound or the lens moves forwards into the wound. This can often happen with patients who have prominent eyes and the appearance of slight proptosis or in tense patients.

The surgeon here must not rush but must be patient, gentle in all manoveours and make every attempt to reduce pressure within the eyeball. He should make certain that the akinesia is good with no squeezing of the eyelids. There is no tension on the superior rectus bridle suture and the eyeball does not tend to roll up and above all, the patient should not be tense and is relaxed. There should be a preplaced corneal suture which should be ready to be tied on extracting the lens. It is wise to do a sector iridectomy before proceeding to extract the lens.

When extracting the lens there should be no traction on the superior rectus suture. The right hand should hold the conjunctival flap with the forceps while the left hand with the cryopencil extracts the lens which is done by the sliding technique without any pressure on the eyeball.

However, if vitreous loss does occur, there is no reason to get depressed as these patients can have good visual results. One should relieve any pressure on the eyeball by releasing the superior rectus suture. The preplaced corneal scleral suture at 12 o'clock is quickly tied. The upper eyelid is brought down and the eye is closed for a few minutes to allow the vitreous to settle and time is taken to reassure the patient that all is well. When the patient is calm, the eyelid is retracted, the wound inspected and iridectomy and vitrectomy done if any vitreous or iris are found in the wound, and the wound sutured. The wound is washed cautiously with saline and any vitreous adherent to the wound washed back into the anterior chamber when forming the anterior chamber. This must be overdone as it can push vitreous out again. The cannula should not enter the anterior chamber.

b. **Vitreous in the Anterior Chamber**

This occurs when the iris and pupil suddenly sink after extraction of lens and the vitreous enters the anterior chamber through the pupil. Both the iris and the vitreous can become adherent to the wound resulting in the pupil riding upwards. A full iridectomy here is justified and any vitreous in the wound washed back in the anterior chamber by washing the wound with saline. This gives a much more satisfactory result with less traction on the vitreous, a more centrally placed pupil, the eye settling faster and a lower incidence of late uveitis.

4. **Sector Iridectomy**

There are certain situations when full or key-hole iridectomy would be preferable to a peripheral iridectomy as this gives rise to less post-operative complications, better visual results and a more central pupil.

a. When there is a vitreous loss or vitreous present in the anterior chamber.

b. In patients with very prominent eyes, having the appearance of slight proptosis who have a higher incidence of vitreous loss. They must be adequately sedated and relaxed and the eye massaged to lower the intra-ocular pressure. Plan doing an elective full iridectomy before intra-capsular extraction of the lens especially if there is tendency for the wound to gape.

c. When cataract extraction is done under local anaesthesia where sedation is not adequate, the patient being restless or there is still some eyelid movement, then an elective broad iridectomy should be done before extracting the lens. A neater and better cosmetic appearance is achieved.

d. When the pupil is small and does not dilate well, a sphincterotomy or an iridectomy could be done. Also when the iris tends to prolapse and there is difficulty in replacing it into the anterior chamber after closure of the wound.

e. In acute glaucoma, secondary to a mature or hypermature cataract, especially if the iris is atropic above and also in patients whose other eye is blind from a retinal detachment.

5. **Problems with Lens Delivery**

a. **Intumesent Cataract:** An intumesent cataract with a very tense capsule is often difficult to deliver especially when using an Arruga's forceps. If a cryopencil is not available a useful procedure is to puncture the capsule with a fine needle. This releases a bead of soft lens matter making the capsule less tense and easier to grasp enabling one to remove the lens within the capsule. One could also tumble the lens using the Old Smith's technique but it

would be wise to use alpha-chymotrysin when doing this, if the patient is under sixty five years of age.

b. **Rupture of Lens Capsule**

Cryo-extraction has greatly reduced the risk of capsule rupture which occurs when the capsule is either weak or if there is excessive traction on it. The capsule is generally degenerate and friable in the elderly patient with nuclear cataract or thin and stretched in intumescent cataracts. A defective tip of the intra-capsular forceps can the tear the capsule as also when the large area of the capsule is frozen when using cryopencil in a wet anterior chamber. When extracting the lens with a weak capsule the anterior chamber and the capsule should be dried with a sponge. It is best to apply the cryopencil close to the equator than at the centre of the lens. Only freeze the cryoprobe after it is in contact with the anterior capsule.

Traction on the capsule may be excessive if the section is small, the pupil has not dilated well, presence of post synechiae, a strong zonule or when the lens is large as in old patients with nuclear cataracts. A section of 160 circumference is adequate and if the pupil is not dilating a sphincterotomy at 6 o'clock is very useful unless one decides on a sector iridectomy.

It is also useful to use a little expression especially towards the end of delivery of the lens. If the capsule ruptures, then remove all capsule adherent to the cryopencil but at the same time do not release the pressure over the lower half of the cornea as the lens nucleus may fall back into the anterior chamber if pressure is not maintained.

The lens nucleus and soft lens matter is slowly eased out with an iris repositor. Remnants of the lens capsules lying in the wound and on the anterior surface of the iris are removed with an Arruga's forceps. The pre-placed corneo-scleral suture at 12 o'clock is tied and the soft lens matter in the anterior chamber is then gently washed out. Any capsule remnants floating in the anterior chamber can be picked with an Arruga's forceps and removed usually leaving a clear vitreous face and pupil.

6. **Subluxated Lens**

When dealing with a subluxated lens there should be at least one pre-placed corneo-scleral suture. The section should be larger, extending round 180 circumference and preferably made over the area where the zonule is still intact and the lens is lying on the surface of vitreous. A sector iridectomy is carried out exposing the subluxated lens. The anterior chamber is dried with a sponge including any presenting vitreous. The lens is then touched with the cryopencil, any iris or vitreous being pushed aside with the sponge. Lens is then lifted upwards and any remaining zonular fibres are gently broken by side to side movement, (the assistant holding the conjunctival flap and cornea with forceps) and no pressure is used to express the lens, the lens being delivered by the sliding technique. The vectis is used to remove the lens, when the lens is lying deeper in the anterior vitreous and covered by the vitreous, as it can be difficult to get the cryopencil to adhere to the lens. If the lens falls further back into the posterior vitreous and the capsule is intact make no attempt to extract the lens and close the wound for these eyes can have good vision for years. However, if the capsule has ruptured, try to remove the lens nucleaus. A retained lens with a ruptured capsule will cause chronic uveitis leading to an uncomfortable, irritable blind eye.

7. **Shallow Anterior Chamber**

The commonest causes of a shallow anterior chamber is a leaking wound, choroidal detachment or sudden emptying from trauma or straining. Adequate wound closure by multiple by carefully placed sutures has reduced the incidence of this complication considerably, choroidal detachment and trauma are now the major causes. There is also a strong psychological factor, as the majority of my patients who develop shallow anterior chambers are Indians and generally do well on tranquilisers. Reassurance, physical and mental well-being are important.

I prescribe diamox 500 mg statum and 250 mg thrice daily and dilate the pupil. Diamox is reduced to 250 mg twice daily after three days and once daily after six days. The action of diamox here is uncertain. It reduces the amount of the aqueous being secreted and it may thus dry the leaking fistula and also allowing time for the supra choroidal fluid to be absorbed.

It is necessary to operate if the anterior chamber does not reform after 14 days. Release the supra-choroidal fluid by a scleral puncture over the site of choroidal detachment and reform the anterior chamber with air (not saline) using $\frac{1}{2}$ cc of air. If there is a leaking wound this can be closed by the application of light diathermy or placing additional sutures at the site.

8. **Prolapse of Iris**

In these days with multiple sutures and careful closure of the wound, the incidence of prolapse iris is very low indeed. Prolapse of iris is generally due to a direct knock on the eye or severe jolt as from a fall. This must be stressed to every patient and he should be asked to have restrainers on his hands when sleeping. When it occurs, excision of the prolapse is done within 48 hours of discovery with suture of the gap, the patient prepared as for

cataract extraction. If the iris is just caught in the wound, then one could try for 48 hours a strong miotic (phospholine iodide or tosmillan) to pull the iris back into the anterior chamber but this treatment is very rarely successful.

9. **Secondary Cataract**

This is best prevented by washing out as much soft lens matter as possible at the time of surgery and removing as much of the capsule remnants as possible with an Arruga's capsule forceps or plane iris forceps. Any remaining posterior capsule should be observed and divided as soon as it is noticed to thicken.

Occasionally, one gets patients where there is dense pupillary membrane which has been present for some time, especially in monocular cataracts. This dense and strong membrane is best cut with a de Weckers acissors rather than dividing it with a Ziglers knife and this may have to be combined with an iridectomy.

10. **Enophthalmitis**

Endophthalmitis, in particular, bacterial endophthalmitis is one of the most serious and devastating complications of cataract extractions. Therefore early diagnosis and prompt intensive treatment is essential so that some good vision can be retained in the eye

Preventive measures must ensure the conjunctival sac clean and healthy Routine pre-operative culture for organisms in quiet eyes is of doubtful benefit and I do not culture as a routine Pre-operative antibiotics such as topical application of chloromycetin, soframycin or gentamycin eye drops could be very helpful and should be given routinely to all patients and the conjunctival sac irrigated before surgery. Sub-conjunctival soframycin or gentamycin injections may be given immediately after operation.

Post-operative infective endophthalmitis is suspected when there is severe anterior uveitis with pain and tenderness of the eye, swelling of the eyelids, chemosis, hazy cornea, cloudy anterior chamber or presence of hypopyon and this generally occurs on the second or third day. It is treated by conjunctival injections of gentamycin (garamycin) 25 mg and or soframycin 250 mg. This is repeated the next day when the patient in addition receives sub-conjunctival injection of prednisolone acetate 40 mg into the lower fornix and orbit. The sub-conjunctival anti-biotic injections are repeated at 24 – 48 hours intervals depending on the severity of the reactions until there is good response to treatment and the infection is resolving, (generally 4 – 6 injections are given). In addition to sub-conjunctival injections, the patients receives systemic therapy of either chloromycetin 250 mg four hourly or vibramycin 200 mg as initial doses and 100 mg daily. Sodium Fusidate (fucidin) is also reported to give good results. Prednisolone 20 mg daily is given for five days after which the dosage is reduced rapidly.

For topical therapy soframycin, gentamycin or chloromycetin drops are instilled every hour for the first two days after which in addition to antibiotic drops dexamethasone or prednisolone drops are instilled two hourly. The pupil is kept dilated by atropine drops twice daily. In order to achieve the best results it is essential to treat all cases with antibiotics and followed 24 hours later by addition of corticosteroids. With corticosteroids therapy the inflammation settles faster and the eye is more comfortable and the anti-inflammatory action of the steroids prevents or reduces formation of pupillary membranes.

Late uveitis usually beginning about the 7th – 10th day is generally less severe and may be due to a reaction to lens protein or to re-activation of endogenous uveitis. These patients are treated by dilating the pupil and the use of topical corticosteroids and sub-conjunctival prednisolone acetate.

11. **Anaesthesia**

A plea is made for more cataract surgery under local anaesthesia for adults. Local anaesthesia with adequate sedation is very suitable for cataract extraction in adults because:

a) It is safe as only 5 cc of 2% xylocaine solution is adequate for facial block, retrobulbar, superior rectus and eyelid injections, providing excellent anaesthetic effect.

b) Patients recover faster and are ambulent earlier.

c) It saves time, the time taken to operate under local anaesthesia is half of that taken under general anaesthesia.

d) During the present shortage of anaesthesiologists, the use of local anaesthesia in cataract surgery releases them for surgical procedures where their need is more essential.

e) It is cheaper in terms of cost of drugs, equipment needed and the staff required to administer it.

f) Retrobulbar haemorrhage is a rare complication and its incidence is reduced by the use of a round tipped or blunt needle.

12. **Astigmatism**

The resulting astigmatic error and the axis of astigmatism of the aphakic correction is greatly depended upon the care taken in suturing the corneo-scleral wound. If the track of the suture is deeper in the corneal lip and more superficial in the scleral lip then an astigmatic error with a horizontal acis results. So it is essential that the sutures should be well placed and the depth should be about equal in the cornea and the sclera to achieve the smallest astigmatic correction.