Surgical Technique

Simple New Technique for Scleral Fixation of IOL

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Introduction

Scleral fixation of IOL is indicated in cases of aphakia with absent or inadequate capsular bag support. This includes aphakia following a large PC rent, following penetrating injury, in cases of subluxation or dislocation of lens, hypermature cataracts with weak zonules, pseudoexfoliation with zonular dialysis, microspherophakias etc.

An ideal method stabilizes the IOL in the ciliary sulcus without any tilt or decentration, and avoids damage to ocular tissue. This wonderful idea of scleral suturing of IOL was first described by Dr. Malbran et al in 1986. Later Dr. Lewis J.S. popularised the ab-externo technique of scleral fixation in 1991. Here ‘rail-roading’ of a straight scleral fixation needle with suture is done through a hypodermic needle “inside” the eye. Numerous modifications came thereafter like knotless scleral fixation, sutureless scleral fixation, glued IOL etc.

In sutureless scleral fixation and glued IOL techniques, intraocular bimanual ‘hand-shake’ technique is used. Here the haptics of the 3 piece IOL are grabbed through the respective sclerotomies using microvitreous forceps and exteriorised. Then haptics are tucked into scleral pockets dissected at the edge of the flap using 22G needle or 23G MVR blade.

Increased intraocular manipulations and surgical time will result in more complications. IOL tilt and decentration are problems, which result in poor visual outcome especially when the points of IOL fixation are not exactly at 180°.

In this article, we shall explain a simple new method for scleral fixation of IOL. The key step is passing the scleral fixation needle and 10-0 prolene suture across the posterior chamber using a 26G 1.5 inch needle without any rail-roading or hand-shake “inside” the eye.

Materials

1. 26G 1.5 inch disposable needle – 1 no.
2. Double armed 10-0 prolene suture with straight needle at one end and curved needle at the other end- 2 nos.

Surgical Steps

Ensure a soft globe before surgery. After peribulbar anaesthesia, conjunctiva is reflected from limbus at two sites 180° apart i.e., from 2’o clock to 3’o clock position and from 8’o clock to 9’o clock position in case of right eye and 3’o clock to 4’o clock position and 9’o clock to 10’o clock position in case of left eye. Adequate cautery ensures good haemostasis.

Partial thickness scleral tunnels with 2.5mm width are created in the above sites parallel to the limbus. For this first a 2.5mm horizontal partial thickness scleral incision is made close to the limbus and then tunneling is done with a crescent blade. Cutting the tunnels at the distal ends with vannas scissors create limbal based right angled triangular flaps diagonally opposite to each other (Fig. 1).

Now the straight needle on 10-0 prolene is broken into half for easy manipulation and is docked into the lumen of the 26g 1.5 inch needle “outside” the eye (Fig. 2).

This is passed through the temporal scleral bed 1mm posterior to surgical limbus, first perpendicular to scleral surface and once inside the eye, it is advanced across the posterior chamber parallel to iris plane to emerge at the nasal scleral bed 1mm posterior to limbus exactly at 180° (Fig. 3,7). A gentle pressure with fine forceps aids its exit (Fig. 7).

The straight needle with the 10-0 prolene is retrieved. This delivery becomes easier as the length of the straight needle has been reduced to half of its original size before docking.

For additional strength, the double suture technique may be adopted, where another straight needle on 10-0 prolene is docked into the tip of 26g needle before it is withdrawn (Fig 4, Fig 8). This suture is retrieved from temporal bed when the 26g needle is withdrawn from the eye (Fig 5, Fig 9).
Scleral Fixation of IOL
Now two prolene sutures are traversing across the posterior chamber, with one curved needle and one straight needle at the ends on both sides under each flap.

Then a 6.5mm superior sclero corneal tunnel is made (optic diameter of rigid SF IOL is 6.5mm). Now the two sutures traversing the posterior chamber can be easily hooked out through the superior sclero corneal tunnel using a 26G needle bent at the tip or a Sinskey hook. The sutures are cut in the middle and are tied to the corresponding haptics of IOL. (Fig 6)

Each suture is knotted to the haptic eyelet once and then the suture ends are knotted together 7 times over. So the knot becomes easy as well as secure.

Now the IOL is introduced into AC and then placed in the ciliary sulcus and the prolene ends are made taut. Scleral fixation sutures are tied to each other after taking a small bite from the scleral bed with the curved needle on both sides(Fig 10).

Advantages Of Our Technique
1. Sutures are passed exactly through 180°. So there is no chance of lens tilt or decentration.
2. Single passage of needle across the posterior chamber is enough for the double suture fixation.
3. Minimum intraocular manipulation in this technique reduces chances of vitreous disturbances and traction, thereby reducing complications like retinal detachment, macular oedema and infection.
4. This surgery has a shorter learning curve and is less time consuming.

Caution
1. Removal of all lens matter is a must for this procedure.
2. A thorough anterior vitrectomy prevents vitreous incarceration.
3. Avoid scleral dissection and needle passage exactly through 3’o clock and 9’o clock positions to prevent injury to long ciliary vessels.
4. Keep the sutures 0.75- 1 mm posterior to surgical limbus. More posterior suturing will result in vitreous incarceration, greater inflammation and unstable fixation.

Management Of Subluxated IOL With This Technique
Subluxation or dislocation of IOL can occur post-operatively following blunt trauma. Spontaneous posterior subluxation happens after IOL implantation in PC rent. Surgery with IOL implantation in the bag for subluxated cataract even with a CTR also can go for subluxation and dislocation later.

In such cases where the IOL is visible in the pupillary area, we can adopt this technique for the IOL removal with simultaneous scleral fixation of IOL. For this, the 26G 1.5 inch needle is introduced with the docked straight needle.
and 10-0 prolene through the temporal scleral bed and passed behind the subluxated IOL supporting it and then emerged out through the nasal bed as described earlier (Fig 12).

Now through a superior sclerocorneal tunnel, the subluxated IOL is removed. Adequate anterior vitrectomy is done. The straight needle with the 10-0 prolene is retrieved from the 26G needle. Then another straight needle on 10-0 prolene is docked into the tip of 26g needle before it is withdrawn (Fig 4, Fig 8). Scleral fixation of IOL is done as described earlier.

To view this video, please visit: www.ksos.in

References