

limbus, whose length is determined by the particular method to be used to remove the natural lens and hard nucleus. A portion of the anterior lens capsule is removed (anterior capsulectomy) followed by expression of the nucleus. The incision is closed to about 3 to 6 mm, and water infused to the anterior chamber while suction is provided to suck out the cortex from the posterior chamber or phacoemulsification carried out.

The implant lens is dehydrated to the desired size for insertion, between 3 and 6 mm wide, and inserted through the incision towards the desired location. In some cases, such as insertion into the anterior chamber, the lens is not dehydrated at all, but inserted fully hydrated. For convenience of insertion into the posterior chamber, the lens can be dehydrated almost completely, i.e., to less than one half its hydrated length. As the lens enters the eye, it absorbs aqueous humor and begins to expand. Once the lens is in the desired orientation, i.e., past the iris and through the pupil into the posterior chamber, either in the bag or adjacent the ciliary sulcus, it completes its expansion.

It will be appreciated that, due to their relative thinness, the fixation elements hydrate faster than the optical portion, extending both in length and thickness. Thus, while complete hydration requires a longer period of time, hydration which occurs during the first five minutes after insertion is sufficient to prevent the lens implant from moving out of the desired location.

It is a particular feature of the intraocular lens of the present invention that the shape and material of which it is made permit dehydration of the lens to a size which is a fraction of the size of the lens when in use, i.e., 3 mm wide during insertion which expands to a width of 5.8 mm, which permits insertion through a relatively small incision without the necessity for folding the lens. Thus, the lens remains easily maneuverable and manipulable by the surgeon and the need for complicated unfolding maneuvers during insertion or within the eye is obviated.

Testing of the position within the eye when inserting the lens "in the bag" can be accomplished by engaging the lens at apertures 30 and moving the lens to one side. If the lens returns to the center by itself, it is properly located. If it remains to one side, it has not been inserted into the lens capsule, and can be further manipulated until it is properly located. The incision is then sutured, as in conventional eye surgery.

It will be appreciated by those skilled in the art that the invention is not limited to what has been shown and described hereinabove by way of example. Rather, the scope of the invention is limited solely by the claims which follow.

I claim:

1. An intraocular lens comprising a hydrogel material and defining:

a central optical portion; and,

only two oppositely disposed equidistant elongate, fixation elements integrally formed with and extending axially from said optical portion said fixation elements and optical portion defining a straight line, said fixation elements tapering gradually and symmetrically to a minimum along a smooth curve over its length to its outer end, said tapering being normal to the plane of said optical portion thereby substantially eliminating weak points at the interface between the optical portion and the fixation elements.

2. A lens according to claim 1 and wherein said hydrogel material comprises an optical quality hydrogel material having about 60% water content.

3. The lens of claim 1 wherein the lens gradually tapers symmetrically normal to the plane of the optical portion along its length from the optical portion to the outer ends of the fixation elements to a thickness of about 0.2-0.3 mm.

4. A lens according to claim 1, wherein said optical portion defines a bi-convex cross-section.

5. A lens according to claim 1, wherein said optical portion defines a plano-convex cross-section.

6. A lens according to claim 1, wherein at least one of said fixation elements is substantially rectangular at its end in the plane of the optical portion.

7. A lens according to claim 1, wherein one of said fixation elements defines a tapered end.

8. A method of operating in the eye comprising the steps of:

removing the natural lens of the eye and part of the anterior capsule portion;

dehydrating to the desired degree a lens implant of a hydrogel material defining a central optical portion and only two oppositely disposed, equidistant, elongate fixation elements integrally formed with said optical portion said fixation elements and optical portion defining a straight line, said fixation elements tapering gradually and symmetrically to a minimum along a smooth curve over its length to its outer end, said tapering being normal to the plane of said optical portion, thereby substantially eliminating weak points at the interface between the optical portion and fixation element;

inserting said lens implant into the desired chamber of the eye; and,

permitting the lens implant to expand into fixative contact in the desired location.

9. The method of claim 8 wherein said step of dehydrating to the desired degree comprises the step of dehydrating to the desired degree the lens to less than one-half of its hydrated length.

10. A method according to claim 8 wherein said step of dehydrating to the desired degree comprises the step of partially dehydrating the lens to about one half its fully hydrated size.

11. A method according to claim 8 wherein said step of inserting comprises the step of inserting the lens into the posterior lens capsule.

12. A method according to claim 8 wherein said step of inserting comprises the step of inserting the lens into the posterior chamber adjacent the ciliary body.

13. A method according to claim 8 wherein said step of inserting comprises the step of inserting the lens into the anterior chamber for fixation in the angle.

14. A method of operating in the eye comprising the steps of:

removing the natural lens of the eye and part of the anterior capsule portion; and

inserting into the desired chamber of the eye a lens implant comprising a hydrogel material wherein said lens implant is fully hydrated and defining a central optical portion; and only two oppositely disposed equidistant, elongate fixation elements integrally formed with and extending axially from said optical portion, said fixation elements and optical portion defining a straight line, said fixation elements tapering gradually and symmetrically to a minimum along a smooth curve over its length to its outer end, said tapering being normal to the plane of said optical portion, thereby substantially eliminating weak points at the interface between the optical portion and the fixation element.

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