

INTRAOCULAR LENS

BACKGROUND OF THE INVENTION

The present invention relates to an intraocular lens structure designed to be seated partly in the anterior and partly in the posterior chamber of the eye after the removal of a natural lens as a result of a cataract condition.

It has been found that the insertion of an intraocular lens is by far the best solution to correcting vision after cataract surgery. The proper placement of an intraocular lens always involves the risk of damage to the eye during the insertion process as well as at a later time if the intraocular lens dislocates or for some other reason must be removed and/or replaced.

Lenses are known which permit posterior chamber fixation. However, with the known posterior chamber lenses, suitable posterior fixation of the lenses is difficult to predict since visibility of the fixation of the upper foot is totally impossible. The ciliary sulcus region at the upper portion of the eye is totally hidden by the iris and is, therefore, not visible to the surgeon during the implant procedure. Consequently the upper foot is often inadvertently seated in the ciliary sulcus between the capsule and the iris rather than in the capsule itself. Should that occur, removal of the lens, should such be indicated at some later date, may be extremely difficult and sometimes dangerous, in part because the field is not visible to the surgeon but also because adhesion in the ciliary sulcus is substantially greater than in the capsule.

There is a need for a lens which may be easily positioned in the posterior chamber of the eye, which offers a suitable means of support, and which will not result in substantial damage to the eye during removal of the lens at a later date should such removal be indicated.

While it is feasible to seat the bottom leg in the capsule, since the bottom region of the posterior chamber, at the periphery of the iris, is substantially more visible to the surgeon than the aforesaid upper region, it is highly desirable to fixate the upper leg in the anterior chamber angle rather than risk inadvertent fixation thereof in the ciliary sulcus. In the anterior chamber location the upper leg is not only fully exposed to the view of the surgeon both during implantation and later removal but substantially less adhesion will result.

According to the present invention, therefore, the upper leg has a portion extending through the iridectomy from the posterior side of the iris to the anterior side thereof, so that the free end portion of the upper leg can be fixated at the periphery of the iris on the anterior chamber side thereof. There is the further advantage according to this invention with respect to my earlier posterior chamber lens described and claimed in my U.S. patent application Ser. No. 244,930 filed Mar. 18, 1981, now U.S. Pat. No. 4,340,979, that in accordance with the instant invention no portion of the lens extends through the pupil. This eliminates the possibility of any vision distortion resulting from lens constructions in which the top leg of the lens is connected to the optic at a point close to the optic axis while at the same time avoiding the possibility of deformation of the pupil as a result of the portion of the iris which defines the pupil contacting the upper leg in those constructions in which such upper leg connects closer to the periphery of the optic and at such time as the pupil is constricted. The present invention eliminates the possibility of these risks

which exist with lenses in which one of the legs extends through the pupil.

SUMMARY OF THE INVENTION

In accordance with the invention, an intraocular lens suitable for use as an artificial lens implant comprises a medial, light-focusing, lens body intended to be positioned adjacent the pupil on one side of the iris and a pair of position fixation elements connected with the lens body. One of the position fixation elements has a first portion contiguous to and extending generally laterally outwardly from a first region of the periphery of said lens body and intended to extend to and seat adjacent the periphery of the iris on the aforesaid one side thereof. The other of the position fixation elements has a first portion extending generally laterally outwardly from a second region of the periphery of the lens body spaced from the aforesaid first region and in a direction generally opposite to that of the aforesaid first portion of the aforesaid one position fixation element. The other position fixation element has a second portion extending from the first portion thereof and intended to extend through an opening in the iris from the aforesaid one side of the iris to the other side of the iris and a third portion connected to the second portion and intended to extend to and seat adjacent the periphery of the iris on the aforesaid other side thereof.

Also in accordance with the invention, an intraocular lens suitable for use as an artificial lens implant having an optical zone positioned posteriorly of the iris comprises a medial, light-focusing lens body and at least a pair of position fixation elements connected with the lens body. At least one of the pair of position fixation elements has a first portion contiguous to and extending generally laterally outwardly from a first region of the periphery of the lens body and intended for seating in the sulcus of the posterior chamber capsule. The other of the pair of position fixation elements has a first portion extending generally laterally outwardly from a second region of the periphery of the lens body spaced from the first region and in a direction generally opposite to that of the first portion of the aforesaid one position fixation element. The other position fixation element has a second portion extending from the first portion thereof and intended to extend through an opening in the iris from the posterior side of the iris to the anterior side of the iris. The other position fixation element has a third portion connected to the second portion and intended to extend to the periphery of the iris for sealing in the anterior chamber angle of the eye.

Also in accordance with the invention, the method of inserting the optical zone of an intraocular lens into the posterior chamber of an eye comprises inserting a first position fixation element, extending generally laterally outwardly from the lens body, through the pupil into the sulcus of the posterior chamber capsule. The method also includes inserting a second position fixation element, extending outwardly from the lens body, through an opening in the iris into the anterior chamber angle of the eye.

Means for urging engagement of the first and second position fixation elements to the periphery of the iris may take the form of a spring mechanism and the like. It has been found that simply forming at least a portion of the first and/or second position fixation elements of resilient material produces a spring-like effect. In addition, each position fixation element may be an elongated