ANTERIOR-CHAMBER INTRAOCULAR PROSTHETIC LENS

FIELD OF THE INVENTION

The present invention relates generally to ophthalmology and more specifically to an anterior-chamber intraocular prosthetic lens or lenticulus inserted into a patient's eye after, e.g., surgery for cataract extraction.

BACKGROUND OF THE INVENTION

There are hitherto known a rather great number of diverse types of intraocular prosthetic lenses otherwise named lenticuli, comprising an optical element (usually a lens), and supporting setting elements adapted for the prosthetic lens to insert into a patient's eye. The supportng elements were usually made from thin wire structures curved in an arcuate form or as loops, or else as platforms. One of such prosthetic lenses with the supporting elements as platforms is described in U.S. Pat. No. 4,277,851 issued on July 14, 1981.

Such a prosthetic lens comprises an optical element made fast in between two diametrically opposite supporting elements, each of these being in fact an arcuate supporting platform intended for being fixed in the anterior eye chamber. Each of the supports has coplanar legs running in the opposite directions as far as the boundary of the eye chamber. Recesses are provided in the outside lateral edges of the supporting elements, said recesses being located on any side of a transverse line passing square with said lateral edges and through the centre of the prosthetic lens. The posterior surface of the optical element is situated underneath of the plane of the legs.

However, the aforediscussed intraocular lens implant suffers from a number of cardinal disadvantages, since unilateral implantation of such a prosthetic lens, wherein the posterior surface of the optical element is arranged above the plane of the legs results in a high degree of anisoiconia. Implantation of the intraocular prosthetic lens of such a construction causes emptying of the anterior eye chamber, which in turn results in injury to the endothelial cells of the cornea. Moreover, even an inconsiderable discrepancy between the lens size and the diameter of the anterior eye chamber, when the length of the prosthetic lens is less than the aforesaid dimension of the patient's eye, mobility of the prosthetic lens may result, which might lead to some postoperative complications, such as corneal edema or iritides.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an anterior-chamber intraocular prosthetic lens which would make it possible to avoid emptying of the anterior eye chamber at the instant of its implantation.

It is another object of the present invention to provide an anterior-chamber intraocular prosthetic lens which would make it possible to reduce the contact area of the supporting elements with the reactive tissue of the iris.

It is one more object of the present invention to provide an intraocular prosthetic lens which would be capable of better delivery of the aqueous humor to the angle of the anterior eye chamber.

There is worth noting, among objects of the invention, one of better centring of an intraocular prosthetic lens, as well as improved conditions of the operative procedure involved.

Said and other objects of the invention are attained due to the fact that in an intraocular prosthetic lens, comprising an optical element secured between two diametrically opposite supporting setting elements, according to the invention, one of said platforms is formed by a circumferential sector, while the other platform is formed by two rounded-off symmetrically arranged portions. The circumferential sector and the rounded-off portions are conjugated with the optical element through transitional portions having shoulders. Both of the platforms have a biconcave cross-sectional shape and are substantially coplanar, one of these being thicker than the other.

The herein-proposed construction of an intraocular prosthetic lens possesses quite a number of substantial advantages which are briefly considered hereinbelow.

Provision of the lateral concave sides of the transitional portions and shoulders in the zone of joining with the sector makes it possible to avoid emptying of the anterior eye chamber at the instant of implanting an intraocular prosthetic lens, while the circumferential sector is practically unobstructedly passed through the operative discision. Provision of the shoulders on the other conjugated portion enables one to avoid emptying of the anterior eye chamber at the instant of passing the platform with rounded-off portions. This in turn makes it possible to fill up the anterior eye chamber at a minimum consumption of the irrigation liquid which is sufficient to maintain such a depth of the anterior eye chamber that is necessary to rule out the contact of the intraocular prosthetic lens with the endothelium at the moment of implanting the former into the patient's eye.

Thus, provision of projections on the supporting platforms makes it possible, at the instant of implanting an intraocular prosthetic lens, to fill up the anterior eye chamber with the irrigation liquid but twice rather than to carry out permanent irrigation, thereby minimizing the irrigation liquid consumption. The biconcave surfaces of the platforms of the supporting setting elements make it possible to reduce their contact area with the reactive tissue of the iris. Besides, the supporting elements having concave surfaces and adjacent to the iris, define a "tunnel" along with the outer iridic surface, with the result that delivery of the aqueous humor and the substrates contained therein to the angle of the anterior eye chamber is improved in the zone of an intimate contact with the supporting setting elements. This also contributes to better trophicity in the aforesaid zone and renders such a complication as secondary glaucoma less probable. Dissimilar thickness of the supporting elements enables one to attain correct centring of the prosthetic lens mass and thereby to avoid development of twisting moment or torque. Furthermore, in cases of a slight dimensional discrepancy, when the length of an intraocular prosthetic lens is less than the diameter of the anterior eye chamber, it is due to different thickness of the supporting elements that the thicker element wedges in the zone of the angle of the anterior eye chamber that does not protrude beyond the boundary of the scleral spur, thus preventing the intraocular prosthetic lens from rotation and displacement.

BRIEF DESCRIPTION OF THE DRAWINGS

In what follows the present invention is illustrated by a detailed description of a specific but not limiting embodiment of an intraocular prosthetic lens, according to