

The History of Intraocular Lenses

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In order to fully understand the technological evolution of cataract surgery over the past 50 years, we need to compare current surgical procedures and visual recovery times with those reported half a century ago. A look at the history of cataract surgery clearly shows that its evolution is an outcome of the vision of a few inspired pioneers who had great passion for their profession.

When phacoemulsification was first developed by Charles Kelman, it faced strong opposition and hence took time in being accepted by the majority of eye surgeons (Figure 1-1).

It was only with the introduction of intraocular lenses (IOLs), and to a greater degree with the advent of foldable IOLs, that the technique was accepted and used on a much larger scale.

In the same way, the evolution of the IOL itself was influenced by ongoing technological progress with phacoemulsification devices and phacoemulsification techniques. This progress led to the development of lenses that could be inserted through increasingly smaller incisions. Today we are able to perform cataract surgery in a few minutes, with visual rehabilitation, and we owe it exclusively to a small number of surgeons who firmly believed in these technological innovations. Charles Kelman was unquestionably the most brilliant mind behind this enormous change.

However, to fully understand the current status of IOLs, it is essential to take a step back in time to more than 60 years ago.

In 1949, Sir Harold Ridley invented the first IOL (Figure 1-2). These lenses had little in common with IOLs used today. They were not easy to implant and were associated with many complications. When he was working with the

Royal Air Force, treating people injured during World War II, Ridley noticed that when splinters of acrylic plastic from shattered aircraft windscreens penetrated the eyes of injured pilots, they were not rejected by the eye; consequently, he suggested using artificial lenses made up of this material to correct aphakia following removal of the lens. He actually got the idea when a student who was assisting him in cataract surgery innocently asked him why an artificial lens was not inserted to replace the focusing natural lens that had been removed from the eye.

Ridley performed his first surgery on November 29, 1949 at St. Thomas' Hospital; he implanted for the first time an artificial acrylic polymethylmethacrylate (PMMA) IOL in a human eye. The surgery was performed with extracapsular technique on the left eye of a 45-year-old woman with unilateral cataracts. Not sure of the stability of the lens, he removed it in a second surgery on February 8, 1950, when the eye appeared inactive.¹

The first IOL was produced by the company Rayner in Brighton & Hove, East Sussex, UK. Currently, this company continues to produce and supply the latest generation of IOLs.

In 1952, the first IOL (a Ridley-Rayner lens) was implanted at the Wills Eye Hospital, Philadelphia, PA. Over the following years, Ridley continued developing his idea of cataract surgery with IOL implantation; he was a pioneer for this type of surgery, despite strong opposition from the entire medical community at that time. He worked tirelessly to reduce complications and improve the technique. Working closely with one of his disciples, Peter Choyce, he eventually enjoyed the support of the scientific community for the technique, and the IOL was finally approved as "safe and effective" and was