

RECENT ADVANCEMENTS IN OCULARISTRY

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Abstract: Ocularistry is an art and science of making custom ocular prosthesis and provides cosmetic rehabilitation to the patients with disfigured eye. Making of prosthesis has become much easier and better with newer techniques and machines. Recent advancements have enabled ocularists to make ultra thin scleral shell which can be worn over a disfigured cornea in pre-phthical eye, a hollow prosthesis which is light in weight in comparison to the conventional prosthesis, painted conformers to replace the old transparent conformers and digital prosthesis which provides ultimate matching with the natural eye.

Loss of an eye leaves a huge impact on the cosmetic appearance of a person. As ocularists, it is our responsibility to help restore maximum facial symmetry for these patients by making best possible custom ocular prosthesis. In early days, ready-made eyes were used extensively, but now custom-made eyes are preferred option for good cosmetic rehabilitation. Science and technology helps us to develop in all aspects of life, including custom ocular prosthesis. We have evolved from glass prosthesis to acrylic prosthesis, 2-D prosthesis to 3-D prosthesis and now digital prosthesis. Enhancing our techniques helps us to provide better options to patients with complications like hollow prosthesis for large sockets or painted conformers for the healing period post-operatively. Modern technology has also helped ocularists to provide better cosmetic options for one-eyed patients having phthisis bulbi and who do not want to undergo surgery. Ultra-thin scleral shell is a good option for such cases where asymptomatic eye used to be removed just for cosmetic rehabilitation¹.

Technology has evolved to a great extent and ocularistry has evolved with much better options for the care of one-eyed patients. Following are the recent advancements added in Ocularistry.

ULTRA THIN SCLERAL SHELL

Scleral shell is an ultra-thin prosthetic eye designed to be worn over a discolored and/or disfigured eye. The prosthesis covers the entire surface of the cosmetically blemished eye, restoring its natural appearance.

Case Report

This is a case of 21 years old female who was diagnosed right eye phthisis bulbi post infection (Figure 1). Patient was given two options for cosmetic rehabilitation. Option 1) Trial of scleral shell, and in case of failure then option 2) Evisceration + orbital implant followed by custom prosthesis. Patient wanted to retain her eye and original movements so the plan of making an ultra-thin scleral shell was executed by taking impression of the eye by alginate. This impression was converted into a very thin scleral shell by scleral press method in which a 1 mm thin acrylic sheet is pressed over the impression to make the masterpiece of the shell². This masterpiece was further painted according to the other eye of the patient. This scleral shell after

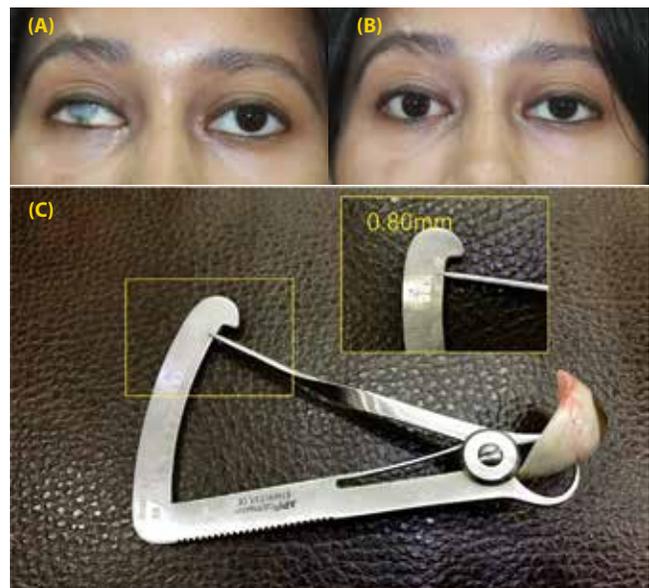


Figure 1: Clinical picture of the patient pre (A) and post fitting of ultra thin scleral shell (B), picture (C) shows the thinness of the shell.

optical grade polishing was dispensed to the patient. Patient achieved satisfying result without compromising her existing eye. Ultra-thin scleral shell is a good option for phthisis bulbi that provides best movements over the disfigured eye.

HOLLOW OCULAR PROSTHESIS

Hollow prosthesis is thick ocular prosthesis, which is made hollow from inside without compromising its anterior and posterior dimensions.

Sometimes there are cases where there is a large volume loss in the socket and further volume replacement surgeries are contraindicated. Such conditions are like socket without implant, severe injury, and severe phthisis bulbi, lid sparing exenteration etc. The impression of such sockets is usually thick, bi-convex and bulky. Prosthesis made using such an impressions becomes heavy. A heavy prosthesis may cause lower lid laxity, lid sagging and can cause secondary ectropion and shallow lower fornix in future. A hollow prosthesis can be prepared which has same dimensions as conventional prosthesis but hollow from inside, which serves with around 30-45% less weight. A hollow prosthesis can replace the need for surgical volume replacement where another surgery is contraindicated. The major limitation of hollow prosthesis is

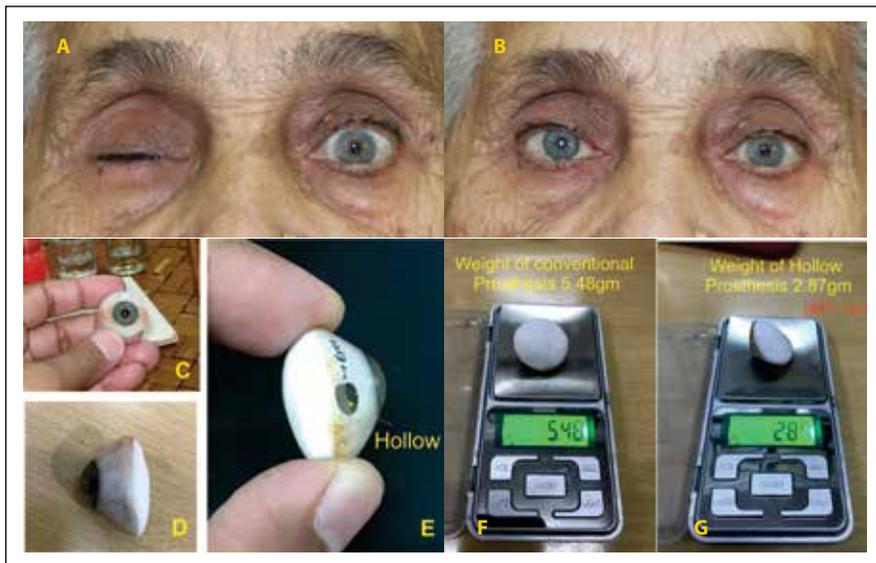


Figure 2: Clinical picture of the patient pre (A) and post (B) fitting of Hollow Prosthesis. Picture (C&D) shows the conventional prosthesis & (E) shows the hollowness of the prosthesis. In picture (F) weight of conventional prosthesis 5.48 gram and in (G) weight of hollow prosthesis which is 2.87 grams is shown.

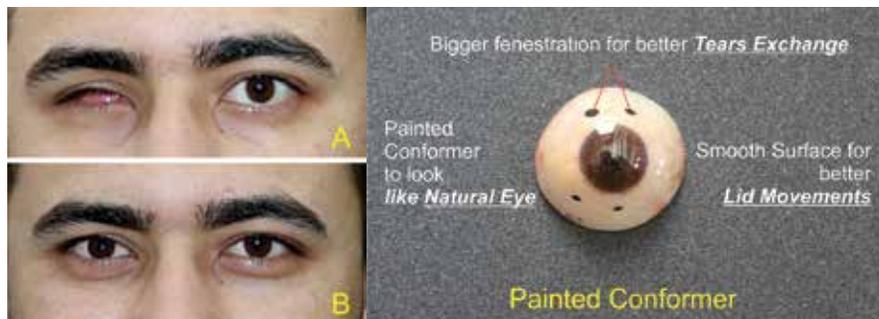


Figure 3: Clinical picture of the patient pre (A) and post (B) fitting of painted conformer.

limitation of movements.

A hollow prosthesis provides similar appearance like conventional prosthesis but less in weight in the socket, which helps in prevention of lower lid complications.

Case Report

This is a case of 67 years old female who was diagnosed right eye anophthalmos post enucleation due to endophthalmitis (Figure 2). There was no orbital implant in her eye and another surgery was not preferred in her case due to her health issues. A custom made ocular prosthesis after taking the impression of socket was made. Weight of the prosthesis was 5.48 grams, which is much higher than the standard range of an ocular prosthesis. Hollow prosthesis (Figure 2E) in which first anterior part was prepared and painted then the posterior part was fused to anterior part without filling the central thickness. This hollow prosthesis has the same dimensions of anterior and posterior surface as that of conventional prosthesis. The weight of this prosthesis

was 2.87 grams, which was 48% lighter than the conventional prosthesis (5.48 grams).

Patient was more comfortable with the new lightweight prosthesis. Hollow prosthesis has an advantage in preventing the socket complications in such cases.

PAINTED CONFORMER

Painted conformers are like normal conventional conformers, which are being used in socket, post enucleation or evisceration but they are painted according to the patient’s fellow eye. Painted conformers provide cosmetic rehabilitation immediately after the surgery.

Transparent conformers are widely used post eye removal surgeries. It provides benefits such as protection of the wound, minimizing the changes in the socket size and conformation, preventing scar tissue contractures from distorting the socket bed³ and maintaining the fornix depth⁴.

Now days, an ocularist fabricates the painted conformer for the patient

which can replace the old transparent conformer. This has several advantages over the transparent conformer by camouflaging the anophthalmic eye immediately after the surgery. With the help of painted conformer, a patient can be socially active after 1 week of surgery or some of them can resume their job and require less leave for surgical healing. Caution- the painted conformers are only for providing cosmetic rehabilitation during the post-surgical healing period. All post-surgical precautions, use of medication, rest and all other activities are same as with normal transparent conformers. Such painted conformers should be changed with the custom ocular prosthesis as per the schedule visit.

Case Report

This is a case of 27 years old male who was diagnosed right eye anophthalmos post evisceration with orbital implantation due to painful blind eye (Figure 3). Patient was delaying his surgery due to his limited leaves. Patient was not willing to join his work with dark glasses, as his work was more in customer dealing. He was suggested to go for a painted conformer after one week of his surgery, which is painted according to the fellow eye. Patient was instructed that this is not a customized prosthesis and doesn’t have advantages of a prosthesis that is made after taking the impression of the socket. It is used primarily post-surgery to avoid the adhesion of the conjunctiva during the healing period. Patient was also advised to use protective glasses and to follow all the post-operative instructions given by his surgeon. Painted conformer provides all benefits of conventional conformers over the cosmetically blemished eye and restores its natural appearance during the healing period.

DIGITAL IRIS PROSTHESIS

It is a recently developed ocular prosthesis, which is prepared with the help of digitally printed iris.

The world is inclining towards the digital technology and in last few years ophthalmology has seen the advantages of digital processing and so is ocularistry. Now ocularists are able to make ocular prosthesis with digital technology, which provides as close as natural look of the iris. In this technology a high-resolution picture of the patients’ normal eye taken with the help of additional macro lens over the DSLR camera with ring flash.



Figure 4(A): digitally printed iris button matching with the other eye. **(B)** Shows the master mold and **(C)** final result with digital iris prosthesis. Image courtesy: Focus Lab, Russia

This picture is processed in Photoshop to remove the reflections from the pictures and then this image is printed over the photo paper. This photo print is used to make the iris button; it is fused in the prosthesis, which is further painted for scleral tinting. Digital Iris prosthesis is a new technique, which will help ocularists

to make prosthesis more accurate and faster in future.

CONCLUSION

Disfigured eye due to any reason causes cosmetic blemish. A carefully made customized ocular prosthesis helps such eyes to look life like. Recent

advancements in ophthalmology can help in providing better quality service and can reduce the limitation of the management of disfigured eye. With the help of digital prosthesis an ocularist would be able to deliver better and faster service in future.

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