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RESEARCH ARTICLE

Sudipta kar's modification in ocular rehabilitation - an effective inexpensive approach towards palliative care***Dr. Sudipta Kar¹, Dr. Pratik Kumar Lahiri, Dr. Anil Kumar Singh**

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Corresponding Author*Dr. Sudipta Kar.****Abstract**

Ocular rehabilitation is an essential part of palliative care in a visually differently able individual. A range of variations persist during construction and fabrication of an ocular prosthesis. It is given after enucleation or visceration of the eye. The optimum functional and aesthetic results of a custom-made ocular prosthesis helps in improvement of life style of a patient in an effective way. Important factors for achieving acceptable aesthetic and functional result are accurate reproduction of ocular defect and proper duplication of natural iris. An inexpensive effective method of fabrication of ocular prosthesis is introduced in this case report. A satisfactory result is achieved by introducing this procedure. This custom-made prosthesis allows reduction of laboratory procedures and fabrication time and improves acceptance. It is part and parcel of palliative care offered by a sensible healthcare professional.

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Introduction:-

Denture base is a part of a denture which rests on the foundation areas and to which artificial teeth are attached. The materials which are used to fabricate denture bases called denture base material. Nowadays poly methyl methacrylate (PMMA) resin has been widely used as a denture base material due to its desirable properties of, low water sorption and solubility, relative lack of toxicity, ability to repair, simple processing techniques and excellent aesthetics.

Beautiful eyes not only provide vision but also they have an important role in facial expression. Ocular disfigurement may cause distinct physical as well as emotional disturbances ^[1]. Major surgical intervention after accidental trauma, or any congenital defect or any pathology may lead to enucleation or visceration of the eyeball ^[2]. Replacement by an artificial substitute, such as an ocular prosthesis is the treatment of choice. The procedure of prosthetic replacement presents many challenges, and one of the notable is the precise preparation of wax conformer for adequate retention of prosthesis into ocular defect. The ancient Babylonians and Sumerians used 'art-eyes' in mummies and statues, made from precious stone, silver or gold ^{[3][4]}. Boissoneau in 1849 produced stock glass eyes ^[4]. During the Second World War, there was shortage of glass material as a result of which the usage of dental acrylic resin was introduced. Ocular prosthesis may be readymade or custom made. The iris can be made by ocular painting or by digital photography. This paper describes the technique for construction of a custom-made ocular prosthesis by digital photography in an inexpensive and effective manner. The custom-made ocular prosthesis can have improved function only when the wax conformer is perfectly matched with the underlying tissue. An innovation was done at the time of fabrication of split cast. Clinicians ^[5] had expressed a technique of replicating the patient's original iris using digital photography. The technique was reliable. So in our case we took the help of photographic technique to reproduce the natural iris.

Case History:-

A 7-year-old female patient, complaining of a non aesthetic appearance due to enucleated left eye four years before due to retinoblastoma, was referred to our department (Fig. 1). On examination palpebral fissures both in open & closed position, internal anatomy of socket, mobility of posterior wall of socket, ocular mucosa were found normal.

An impression of the enucleated socket was made with the assistance of irreversible hydrocolloid impression material (modified impression technique as developed by Allen and Webster)^[6] injected into the socket through the hollow stem of the perforated impression tray (Fig. 2) made by needle cap & clear acrylic resin. The impression was then poured in sections using die stone. Here the innovative modification was done in fabrication of split caste. In this technique we use stainless steel molar band material (which is easily available in department of paediatric dentistry for regular fabrication of band and loop space maintainer) (Fig. 3). This step helps us for easy and undistorted removal of wax conformer from the working caste. Wax conformer was tried on patient to evaluate – size, comfort, eyelid support, and simulation of eye movement. During evaluation it is mandatory to leave the wax pattern in the socket for at least 10 minutes to allow any protective blepharospasm of the orbicular muscle to relax. Then digital photographs of patient's natural iris were taken using a digital camera. Minute adjustment & colour correction was done by computer software. (Adobe Photoshop 7.0). Final image was printed on 120 gsm white paper. The iris diameter was decreased by approx. 1 mm to compensate for the magnification. Multiple prints were then compared with the natural iris for perfect match and some best prints were selected for the case. Second innovation was done at the time of placement of paper iris into wax conformer. Here we made a thin shell of acrylic cover made up of clear poly methyl methacrylate resin to protect digital photograph (Fig. 4). Then a little layer of clear glue was added. Utmost care was taken to avoid any air entrapment. Then an acrylic stem was introduced on to the acrylic cover. Measurement of inner & outer canthal distance was done with the help of slide caliper. Then flasking, dewaxing packing with poly methyl methacrylate resin (matched previously with scleral colour with the help of addition of little bit of zinc oxide powder in clear poly methyl methacrylate resin) was done. (Fig. 5) Silk thread was also added to give natural looks of capillaries. Then curing, finishing polishing was done. The patient was advised to wear the prosthesis day and night. (Fig. 6) She was also instructed to consult an eye specialist for any feeling of irritation and infection. She was strictly instructed to remove the given prosthesis for cleaning once or twice a day. The patient was advised to come for periodic check-up.

Discussion:-

Enucleation of an eye, especially in growing children is associated with physical disfigurement, functional disability, and emotional stress to the growing child. Fabrication of aesthetically acceptable ocular prosthesis, its acceptance & subsequent adaptability to a growing child presents a unique challenge in the form of palliative care. The advantage of custom made prosthesis is 1. Better retention, 2. Can be properly planned, 3. Patient can perform various movements, 4. Exact colour match of iris and sclera, 5. Durable, 6. Better comfort, 7. Near natural aesthetics, 8. Low cost, 9. Readjustable, 10. Simple procedure. It is very much effective for every visually differently able individual who had undergone enucleation or visceration of the eye and also hospital based economically challenged patient. It preserves aesthetics, promote psychological healing, improve social acceptance, and restore self esteem of our beloved patient.



Figure 1 : Preoperative Photograph of Patient

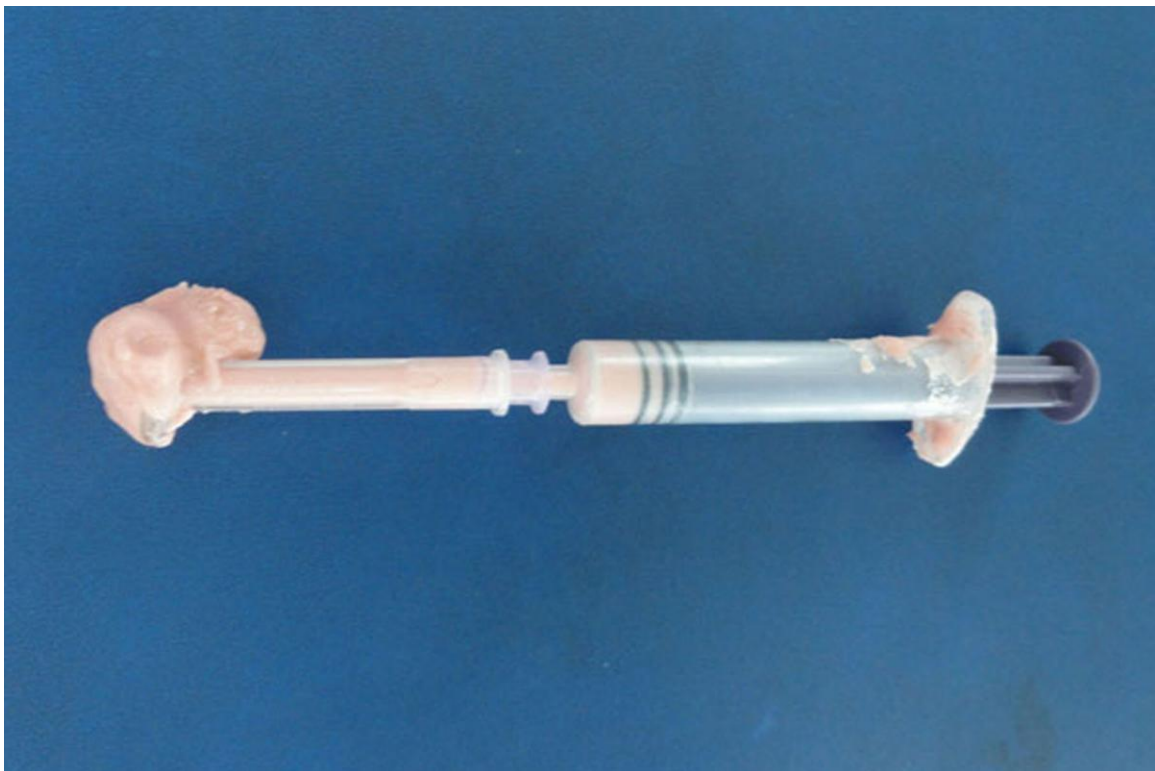


Figure 2 : Impression of the enucleated socket

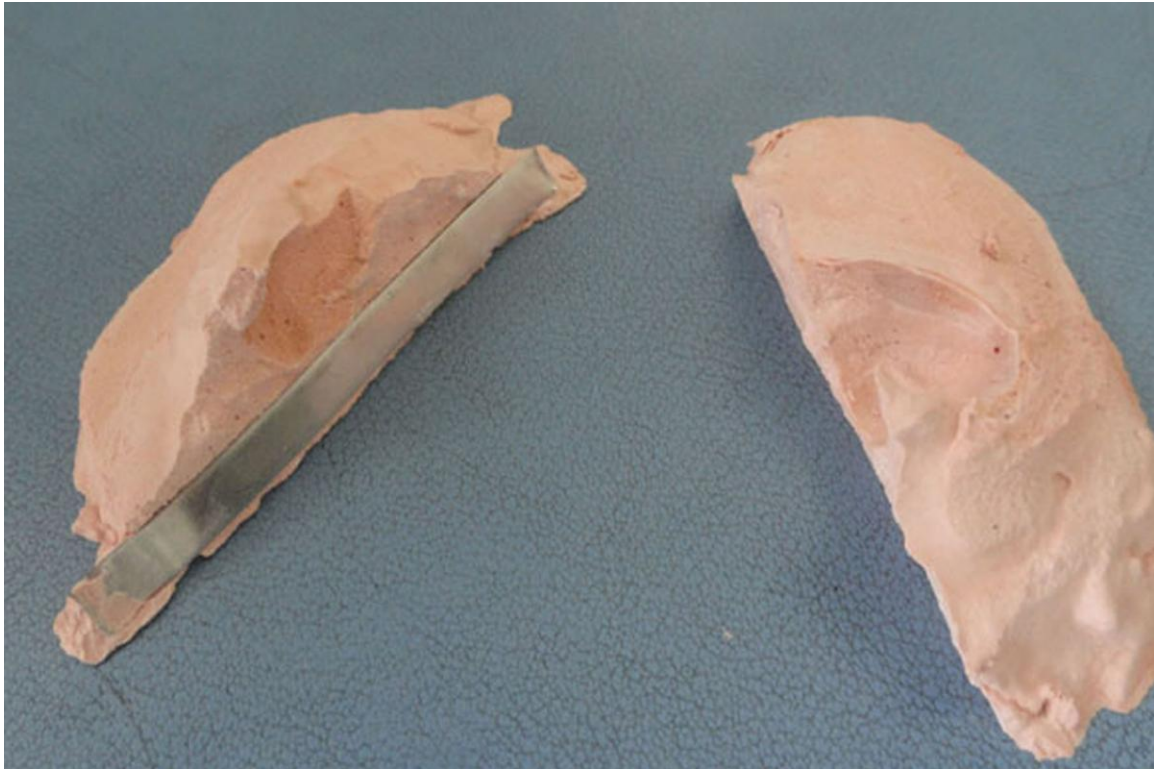


Figure 3 : Innovative split cast



Figure 4 : Innovative ocular thin shell with wax conformer



Figure 5 : Flashed ocular prosthesis



Figure 6 : Post operative photograph

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