Custom Ocular Prosthesis as a Palliative Aid for a Pediatric Patient with a Surgical Enucleation following Retinoblastoma

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ABSTRACT

BACKGROUND & AIMS: Congenital absence or loss of the ocular globe during childhood not only compromises the normal development of the orbital region, it causes esthetic and psycho-social disturbances as well. Literature demonstrates the necessity of prevention and early detection in order to minimize the sequelae and disturbances in orbital growth.The purpose of this article is to highlight customized scleral shell prosthesis as a simple yet effective treatment modality for anopthalmic pediatric patients **METHODS:** For this anophthalmic pediatric patient who reported to us, we decided to fabricate a customized ocular prosthesis by modifying the stock eye prosthesis. Clinical relevance: Fabrication and installation of eye prosthesis is essential to the rehabilitation process especially in a child, so as to produce satisfactory development of the region and for their emotional wellbeing.

Key words: Ocular prosthesis, scleral shell, anophthalmos, retinoblastoma

الملخص

مقدمة : عدم وجود مقلة العين الخلقي او فقدان مقلة العين اثناء الطفولة لا يؤثر فقط علي التطور الطبيعي لمحجر العين ، بل و يسبب اضطرابات جمالية و نفسية واجتماعية . توضح المراجع اهمية وضرورة الوقاية من و الكشف المبكر لهذه الحالات من أجل التقليل من مضاعفات عدم نمو محجر العين . **الهدف:** يهدف هذا المقال لتسليط الضوء علي استخدام بديل اصطناعي مخصص لصلبة العين باعتبارها طريقة بسيطة للعلاج و لكنها فعالة لحالات فقدان مقلة العين لدي الاطفال . **المنهج :** تم صناعة بديل مخصص لصلبة العين وتركيبه لطفل يعاني من فقدان العين . **الاستنتاج :** تصنيع وتركيب بديل صناعي للعين أمر ضروري في عملية إعادة التأهيل وخاصة في الأطفال ، وذلك للحصول علي نتائج جيدة في تطور ونمو المنطقة و في سلامة الصحة النفسية و العاطفية.

INTRODUCTION

The loss of the ocular globe during childhood, be it due to congenital, traumatic or pathological etiologies, affects the growth and development of the orbital area, which in turn may result in hypoplasia and facial asymmetry, and represents an additional factor of aesthetic and psychological imbalance [1]. According to Heher et al [2], ocular tumors such as retinoblastoma are the major causes of ocular globe enucleation during first childhood. In a study with childhood cancer series, the retinoblastoma has been ranked second in occurrence, corresponding to 17.1% of all types of cancer occurring in infants [3]. Considered the most common primary intraocular malignancy of childhood, this neuroblastic tumor may be unilateral or bilateral [4].

Clinical implications: Unlike adults, a child can neither express nor realize the situation of loss of an eye, but non acceptance in the peer group and society in general will undoubtedly have a lasting psychological impact on the child. Hence it is important to provide prosthesis to not only preserve the socket but also to ensure the psychological wellbeing of the child. This article highlights the management of a pediatric patient with the loss of ocular globe following retinoblastoma using a simple yet effective clinical technique.

CASE REPORT

The subject was a four year old female child of poor socioeconomic status, who reported to the clinic for prosthetic rehabilitation of a left ocular defect. On recording the history and obtaining the previous medical records, it was found that the patient had retinoblastoma of the left eye as a result of which the eye had to be enucleated. On examination, it was observed that the mucosa surrounding the eye was healthy and post-surgical healing was uneventful.

Received on: November 12, 2013 Accepted on: January 15, 2014

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It was decided to give the ocular prosthesis by modifying the stock eye prosthesis. The procedure was explained to the patient/ parent and consent was taken for making photographic records. Since this technique was a combination of custom eye prosthesis and prefabricated scleral shell prosthesis, clearance from the institutional ethical clearance committee was obtained.

Clinical Procedure

Lignocaine hydrochloride (2%) topical anesthetic (Neon Laboratories Limited, Mumbai, India) was applied on the tissues of the left eye before making the impression to prevent discomfort to the patient during the procedure. An impression of the affected side of the eye was recorded using custom ocular tray fabricated using self-cure resin (DPI, Mumbai, India) made from a moulage of the contralateral eye . The advantage of using a custom ocular tray is that it ensures the emergence profile of the ocular bulb closely matches the unaffected eye. The handle of the ocular tray was made hollow so that the alginate could be syringed into the defect. The periorbital tissues were coated with a layer of petrolatum jelly so that the impression material could be easily separated from the tissues. Impression was recorded using alginate (Plastalgin, Septodont, India) and was poured in Type 2 Gypsum (Kalstone, Kalabhai, Mumbai, India). The intaglio surface on the cast was coated with separating medium and waxed up using type 2 modeling wax (Hindustan Dental Products, Hyderabad, India). A suitable scleral shell was selected in accordance with the patient's contralateral eye and trimmed to the recorded dimensions. The scleral shell color was then customized according to the patient's contralateral iris size and color; and dewaxing and packing was done with acrylic resin on the intaglio surface of the shell. The prosthesis was finally retrieved to be trimmed, finished and polished. It was then stored in distilled water for 48 hours to let residual monomer leach out to prevent irritation to the sensitive palpebral mucosal tissue.

During the prosthesis insertion phase, the palpebral area was examined and the parents of the child were shown the correct procedure to insert and remove the prosthesis for regular cleaning and maintenance procedures. They were asked to report back on a biannual basis for follow up visits which was duly followed and has so far been uneventful.

Discussion

Loss of the ocular globe may affect normal growth in the periorbital region and may contribute to asymmetry of the facial skeletal complex. Another challenge that needs to be countered is the constant growth of the facial skeletal complex that may necessitate periodic alterations to the existing prosthesis or may need to be changed. Therefore, the prosthesis should be made slightly larger to simulate normal development of the surrounding tissues. It has also been advised to remake the prosthesis at periodic intervals to keep pace with growth till the eye socket is fully developed at around 12 years of age [5].

Two options are available for artificial eye prosthesis; one is a pre-fabricated ocular prosthesis and the other being custom-made ocular prosthesis. literature has also described customizing a scleral shell prosthesis into a custom ocular prosthesis to improve the fit and seating of the prosthesis [7,8] which was used in this case to ensure that the best of both the techniques was achieved. Though there are articles in literature reporting the same, there is a lack of evidence base data regarding the use of this technique with pediatric patients.

Limitations of this technique are that the clinician is dependent on the availability of a pre-fabricated eye with properly matching iris and pupillary part. Also, the long-term color stability of the heat-cured acrylic and the strength of its union with the stock eye will have to be closely evaluated [9]. The option of an ocular implant was also considered but since it necessitated preservation of tenons capsule, which had been already excised when the patient reported, hence this treatment modality was ruled out

Keeping in mind that we deal with pediatric patients, unforeseen complications may also arise. Care must be taken to prevent voids that can accumulate mucus or debris, which may be a potential source of infection in children. Moshfegi et al reported cases of a 30-month- and 32-month-old boy, each of whose eyes had been enucleated for retinoblastoma and swallowed their respective ocular prosthesis on different occasions. But they also mentioned

that each of the children was having life stresses in addition to their medical treatment that may have accounted for their behavior [10].

Conclusion

Irrespective of which technique is followed, the use of a customized ocular prosthesis during childhood entails periodic changes with successive increase in order to accompany the expansion of the anophthalmic cavity, and it is in fact the only way to aesthetically rebuild the anophthalmic socket. It is also deemed necessary to determine periods of ocular prosthesis change during craniofacial growth in order to minimize the possible discrepancy between the compromised and the healthy sides, thus ensuring a balance and harmony of the facial development. Most importantly, there is also a need of providing psychological support to the pediatric patient.

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