

Case report

Ocular rehabilitation following socket reconstruction with amniotic membrane transplantation with failed primary hydroxyapatite implant post enucleation



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ABSTRACT

There are several clinical situations that require enucleation in children, with retinoblastoma being the most common. Intra-orbital implants are routinely placed in children at the time of initial surgery to provide motility and cosmesis in addition to adequate orbital volume. Current practice employs intra-orbital implants made of nonporous silicone, hydroxyapatite, or porous polyethylene. Complications are usually minimal with these implants but they do occur. The purpose of this clinical report is to describe the rehabilitation of a pediatric patient with failed primary intra-orbital coralline hydroxyapatite implant post enucleation, who was successfully fitted with custom ocular prosthesis following secondary socket reconstruction with amniotic membrane transplantation after removal of infected implant.

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1. Introduction

Removal of an eye for treatment of ocular disease was first described by Bartisch in 1583 [1]. The modern form of this operation was introduced in 1841 by Farrell and Bonnet, and in 1885, Mules placed the first intra-orbital implant after evisceration. A year later, Frost described the utility of intra-orbital implant placement after enucleation surgery. Enucleation in a child may result in retarded orbital growth [2]. So following enucleation, primary reconstruction of the socket is usually done with intra-orbital implants so that the potential for contracture and volume deficit is reduced and the best cosmetic results are achieved in addition to stimulation of orbital growth [3,4]. Various intra-orbital implant configurations are available. Different materials may be used to create intra-orbital implants, including cartilage, bone, fat, cork, rubber, gold, silver, silk, wool, aluminum, ivory, petroleum jelly, acrylics, silicone, quartz, glass, titanium, and porous materials such as polyethylene and hydroxyapatite (HA) [1]. Current practice employs intra-orbital implants made of nonporous silicone, hydroxyapatite, or porous polyethylene. The intact extraocular muscles are attached either to the implant or to the wrapping material placed around the implant.

The normal innervations of the muscles move the artificial eye in coordination with the healthy eye so that some degree of normal motility is preserved [3].

Hydroxyapatite, a porous material derived from reef-building coral of genus *Porites*, was introduced as a buried intra-orbital implant by Dr. Arthur Perry in 1985 [5–7]. The major advantage of this implant is its superior biocompatibility and proclivity to become fibrovascularly integrated with the residual muscles and orbital tissues [6,8,9]. One major disadvantage of hydroxyapatite is that the implant must be covered with wrapping material such as donor sclera or donor or autogenous fascia lata because direct suturing to the hydroxyapatite is not possible [10]. Theoretically, the integration of the implant into host orbital tissues reduces the risk of migration, extrusion, and infection in the post-surgical period [11]. However, hydroxyapatite being an alloplastic intra-orbital implant may be associated with potential complications, including exposure, infection and extrusion [1,12,13].

Spontaneous healing of exposed porous implants is relatively uncommon. So, many exposed porous implants are salvaged with secondary repair with patch grafts. However, cases unamenable to conservative management require may implant removal [14]. Following implant removal, a stable socket with adequate forniceal depth must be established by increasing the surface area with the use of grafts [15]. The purpose of this clinical report is to describe the rehabilitation of a pediatric patient with failed primary intra-orbital coralline hydroxyapatite implant post enucleation, who was

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Fig. 1. Pre-operative view showing exposed and medially displaced hydroxyapatite implant in left eye socket.

successfully fitted with custom ocular prosthesis following socket reconstruction with amniotic membrane transplantation (AMT) [16–20] after removal of infected implant.

2. Clinical report

A 3 year-old child with an acquired left ocular defect was referred for the fabrication of an ocular prosthesis. The history revealed that she had been diagnosed with intraocular retinoblastoma of the left eye 6 months back. Enucleation of the left eye with primary intraorbital hydroxyapatite implant placement was performed 2 months back. Post-enucleation adjunctive chemotherapy with six cycles of vincristine, etoposide and carboplatin was also administered. As the optic nerve was not invaded by the malignancy, so radiotherapy was not given.

3. Clinical examination

Examination of the defect area revealed enucleated socket with exposed and medially displaced hydroxyapatite implant along with mucus discharge collection in the inferior fornix (Fig. 1). The patient also reported mild discomfort and pain associated with left ocular socket. The computed tomographic scan findings correlated with the clinical findings (Fig. 2). The patient's condition precluded

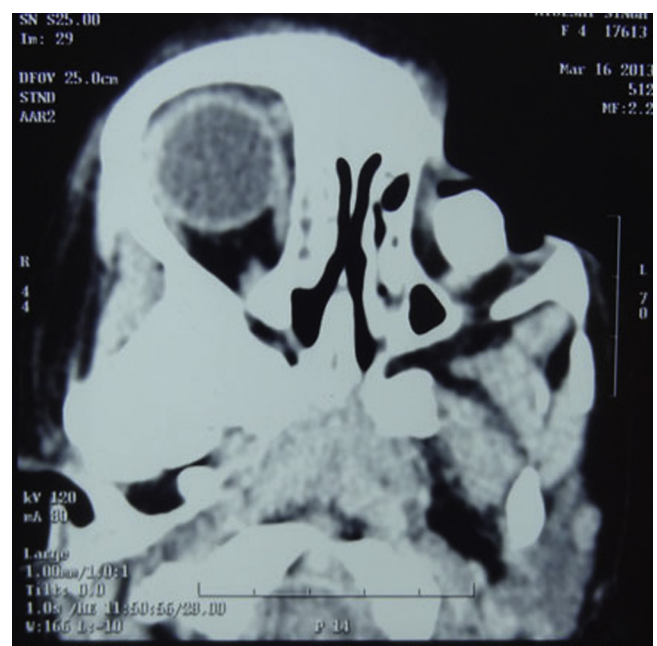


Fig. 2. Computed tomographic scan showing intra-orbital implant in left eye socket.

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