A Case of Anaerobic Abscessed Hydroxyapatite Orbital Implants

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The purpose of this report is to document an unusual case of implant infection in a patient who had undergone enucleation and hydroxyapatite orbital implant surgery. A 32-year-old woman presented with chronic orbital discomfort and discharge following a history of hydroxyapatite orbital implant surgery at another hospital 4 years previous. She exhibited profuse discharge with a yellow, creamy color and marked conjunctival chemosis. Granulation tissue was noted on the central conjunctival surface. Following the removal of the conjunctival granulation tissue, a central 3x5mm conjunctival dehiscence was present with exposure of the hydroxyapatite implant. A culture of purulent drainage emanating from the exposed implant showed a growth of Clostridium acetobutylicum. Removal of the orbital implant was done. The implant was noted to be filled with pus. This case suggests that anaerobic infection may be suspected when the granulation tissue is observed and a discharge with a foul odor is found.

Key words: implant infection, hydroxyapatite orbital implant, Clostridium acetobutylicum

INTRODUCTION

Hydroxyapatite orbital implants are currently popular after enucleation or evisceration, and for secondary implantation surgery. The reported advantages of these implants include lower rates of implant exposure, extrusion, migration, and infection.\(^1\) Fibrovascular ingrowth is theorized to decrease the incidence of infection.\(^3\)

One of the common complications associated with their use have appeared gradually.\(^4\) One of the most common complications is conjunctival dehiscence.\(^4,6\) Other complications include infection, granulation tissue within the peg hole, conjunctival overgrowth, discomfort, peg clicking, and spontaneous displacement of the peg. Among the complications, infection of the implant is rare although it is difficult to control without removing the implant.\(^4,7\) Reported organisms are gram positive cocci, most notably S. aureus, coagulase-negative staphylococci, Streptococcus pneumoniae and \(\alpha\)-hemolytic streptococci, etc.

We present a case of implant infection in a 32-year-old female patient who had undergone enucleation and hydroxyapatite orbital implant surgery 4 years previous. The implant was removed and anaerobic Clostridium acetobutylicum was cultured.
from her socket discharge.

**CASE REPORT**

A 32-year-old woman presented with left chronic orbital discomfort and conjunctival discharge following a history of hydroxyapatite orbital implant surgery at another hospital 4 years previous. An enucleation of her left eye was carried out in August 1994 with implantation of an 18-mm hydroxyapatite implant with an eye bank sclera wrap; an oral mucosal graft for reconstruction of the fornical contracture was done at the same time.

In May 1998, she presented at the Department of Ophthalmology in Chungnam National University Hospital with left perocular pain, swelling and conjunctival discharge. She exhibited anterior scleral necrosis, a profuse discharge with a yellow, creamy color and marked conjunctival chemosis. Granulation tissue was noted on the central conjunctival surface. A purulent conjunctival discharge remained despite topical antibiotic solution coverage. Following the removal of the conjunctival granulation tissue, a central 3x5 mm conjunctival dehiscence was present with exposure of the hydroxyapatite implant.

A culture of purulent drainage emanating from the exposed implant showed a growth of *Clostridium acetobutylicum*, which was sensitive to vancomycin and metronidazole. The patient received 7 days of intravenous antibiotic therapy, however her symptoms did not improve. At the eighth day, the implant was removed under general anesthesia.

At the time of implant removal, the implant was noted to be positioned within the conjunctiva, showing pus filled in the implant pores (Fig. 1). The hydroxyapatite implant was surrounded by a fibrovascular capsule. On microscopic findings, the majority of the hydroxyapatite pores were infiltrated with inflammatory cells consisting of polymorphonuclear leukocytes with lymphocytes, plasma cells, macrophages, and foreign body giant cells (Fig. 2).

Following the hydroxyapatite implant removal, a 16-mm glass sphere was implanted. During the fol-
low-up period, the patient did fine with no sign of infection.

**DISCUSSION**

Porous orbital implants have several advantages over previous implants, including lower rates of implant exposure, extrusion and migration. The extraocular muscles can be attached directly to the implant to provide greater motility. Fibrovascular ingrowth decreases the incidence of infection. The hydroxyapatite orbital implant has been associated with complications such as implant exposure, peg extrusion, conjunctival dehiscence, granulation tissue overgrowth, infections etc. Infection of the implant is rare but feared, as the infection may be difficult to control without removing the implant. Isolated organisms have predominantly included Gram-positive cocci, most notably *S. aureus* and coagulase-negative *staphylococci*. Other organisms isolated include *Hemophilus influenzae*, *S. pneumoni-ae*, *Streptococcus intermedium*, and α-hemolytic streptococci. Lee et al. reported a case of infection by *Pseudomonas aeruginosa*. Wilson et al. recently reported a gram-negative bacillus named *Capnocytophaga*. In our patient, *Clostridium acetobutylicum*, an anaerobic, was cultured.

Anaerobic infections commonly occur in the oropharynx, gastro-intestinal tract or vagina and are characterized by a foul odor. Necroses such as abscess or gangrene are also common. We observed a yellowish discharge with a foul odor at the infected site. Generally, the source of infection in an orbital implant is through the conjunctival dehiscence, from the eyelid during operation, or from the canaliculitis, gingivitis, or periodontitis. In addition, the risk of infection is increased in cases of poor fibrovascular ingrowth into the implant or in immunocompromised patients, such as those with AIDS. We are uncertain how our patient acquired her socket infection. *Clostridium* usually form spores only under anaerobic conditions and almost never produce catalase. Although *Clostridium* species are ubiquitous in nature, their principal habitats are the soil and the intestinal tracts of many animals including humans.

In general, anaerobes are considered to be resis-

tant to quinolone agents, and quinolones have not been recommended for the treatment of mixed infections involving anaerobes. Chloramphenicol, piperacillin, metronidazole, imipenem, and combinations of β-lactam drugs with β-lactam inhibitors (e.g., ampicillin-sulbactam) are active against nearly all of the clostridia with only a few exceptions. The clostridia have shown variable resistance to cephalosporins and tetracyclines, and they are usually resistant to aminoglycosides as well.

For reducing the possibility of socket infection, an aseptic procedure is required, without unnecessary steps and including washing the implant with antibiotic solution. We use a syringe containing antibiotic solution for infusing the antibiotics into the implant under negative pressure. Particularly in the case of an oral mucosal graft, careful handling is extremely important. Using the donor sclera for an outer coat of the implant requires aseptic preparation.

After an infection becomes established, appropriate antibiotic therapy is so difficult that the infected implants should be removed eventually. In our case, topical and systemic antibiotics were not effective. We believe that implant removal may be the only treatment option after an infection has become established.

Finally we believe that anaerobic infection of the implant may be suspected when granulation tissue is seen on the conjunctival surface and conjunctival discharge with a foul odor is found.

**REFERENCES**


