causes facial deformities and abnormalities of dentition. The disease generally progresses until puberty and may regress in adulthood. Radiologically, the radiolucent bony lesions are cystic and multiloculated in nature and are bilateral. These findings in conjunction with the clinical presentation are usually enough to make a diagnosis. Unless surgical intervention is needed for genetic or reconstructive purposes, a confirmatory biopsy is not obligatory. If a biopsy is performed, the histopathological differential diagnosis of lamellar bone formation with fibrous stroma and giant cell formation includes fibrous dysplasia, aneurysmal bone cyst, central giant cell granuloma of bone, and brown tumor of hyperparathyroidism. However, on the basis of clinical presentation and laboratory data, alternative diagnoses can be ruled out. Indications for treatment include functional problems, such as dental abnormalities and visual compromise, and the need for cosmesis. Treatment of choice is surgical curettage and contouring. Radiation therapy is not recommended because of risks of osteonecrosis and sarcoma transformation.

We present a case of cherubism with documented visual loss secondary to optic neuropathy and macular chorioretinal folds/scarring directly attributable to compression from the fibro-osseous growth within the orbit. To our knowledge, only 3 other cases of cherubism have been described in the ophthalmic literature.

Figure 4. Fibrous stroma with scattered multinucleated giant cell adjacent to bone seen on histopathological examination (hematoxylin-eosin, original magnification: A, ×40; B, ×10).

Endophthalmitis Caused by Mycobacterium chelonae: Selection of Antibiotics and Outcomes of Treatment

Mycobacterium chelonae is a rapidly growing acid-fast bacterium that has been reported to cause keratitis, interface infection after laser in situ keratomileusis, scleral buckle infection, keratitis in a corneal graft, and periocular infection after dacryocystorhinostomy and ptosis repair. In a review of the literature, a total of 4 cases of endophthalmitis caused by M chelonae have been reported. The current study reports 5 cases of culture-proved endophthalmitis caused by M chelonae at Bascom Palmer Eye Institute, Miami, Fla, between January 1, 1980, and December 31, 2001.

Report of Cases. Case 1. A 62-year-old man received an intravitreal injection of triamcinolone acetonide (4 mg/0.1 mL) in October 2001 for clinically significant macular edema reducing visual acuity to 20/70 OD.
In November 2001, the patient returned with blurry vision and pain in the right eye. Results of examination demonstrated a visual acuity of hand motions, anterior chamber cells, and dense vitritis in the right eye. The eye was treated with a vitreous tap and injection of intravitreal antibiotics. Vitreous cultures were negative. Because of persistent vitreous inflammation, a pars plana vitrectomy was performed in the right eye in December 2001. Vitreous cultures were again negative.

On initial examination by our group, the patient had a visual acuity of hand motions, 2+ corneal edema, 2+ cell and flare in the anterior chamber, and opacification of the vitreous cavity in the right eye. Ultrasonography showed diffuse vitreous opacities, 360° choroidal detachment, and no retinal detachment. A pars plana vitrectomy and lensectomy were performed. Injections of amphotericin B, 0.01 mg, cefazidine, 2.25 mg, and vancomycin, 1 mg, were given. Cultures of the vitreous cavity yielded *M chelonae*, sensitive to clarithromycin and amikacin; immediately sensitive to tobramycin, imipenem, and cefoxitin; and resistant to ciprofloxacin, doxycycline, and sulfamethoxazole-trimethoprim. Despite 3 months of treatment with topical fortified amikacin sulfate and 4 intravitreal injections of 0.4 mg of amikacin sulfate, the visual acuity progressed to no light perception in February 2002. In each of 4 separate vitreous cultures, growth of *M chelonae* was documented, but the final culture, taken when the visual acuity was no light perception, showed no growth. The eye was enucleated in April 2002, and histopathologic examination demonstrated persistent acid-fast organisms in multiple intraocular tissues.

**Case 2.** A 76-year-old man underwent uncomplicated extracapsular cataract extraction and intraocular lens (IOL) implantation in the left eye in September 1992. In May 1994, the patient was referred with a complaint of 4 months of pain and decreased vision in the left eye.

On initial examination by our group, the patient had visual acuity of 20/300, a hypopyon smaller than 1 mm with anterior chamber cellular reaction, a posterior capsular plaque, and diffuse vitreous cells in the left eye. Pars plana vitrectomy and injection of intravitreal antibiotics were performed in May 1994. A second pars plana vitrectomy and injection of intraocular antibiotics, as well as an IOL exchange, were performed in August 1994. In October 1994, the patient returned with visual acuity of 1/200 and a hypopyon in the left eye; a fluid-air exchange was performed, and vitreous cultures yielded *M chelonae*, which was sensitive to erythromycin, immediately sensitive to ciprofloxacin, and resistant to tetracycline, sulfamethoxazole-trimethoprim, cefoxitin, and amikacin. Treatment with topical amikacin and oral rifampin was initiated, and smoldering inflammation with intermittent hypopyon formation persisted. In April 1995, the patient underwent a third pars plana vitrectomy, with further removal of residual lens capsule, vitreous culture, and injection of intravitreal erythromycin lactobionate, 0.5 mg, and imipenem, 0.5 mg. Vitreous cultures showed growth of *M chelonae*. Intraocular inflammation resolved. In July 1995, final visual acuity was 5/200 OS.

**Case 3.** A 77-year-old man underwent intracapsular cataract extraction without IOL in the left eye in 1979. A secondary IOL was placed in the left eye in December 1985 without complication. Four weeks postoperatively, pain and blurry vision developed in that eye.

On initial examination by our group, the patient had a visual acuity of 20/100 OS with a 10% hypopyon, and fluffy white infiltrates on the anterior hyaloid face (Figure A). Possible fungal endophthalmitis was diagnosed. The patient was treated with an anterior chamber tap, anterior vitrectomy, and intravitreal injection of gentamicin sulfate, 0.1 mg, and amphotericin B, 0.01 mg. Anterior chamber cultures yielded *M chelonae* sensitive to clarithromycin, amikacin, kanamycin, and tobramycin, and resistant to ofloxacin and ciprofloxacin. Despite 3 intravitreal injections of amikacin sulfate (0.25 mg) and 2 months of topical fortified amikacin and prednisolone acetate, in December 1986, final visual acuity was hand motions and the intraocular pressure was 0 mm Hg by applanation tonometry (Figure B).

**Case 4.** A 70-year-old woman underwent complicated cataract extraction in the right eye in Febru-
Table 1. Endophthalmitis Caused by *Mycobacterium chelonae*: Source, Treatment, and Outcomes

<table>
<thead>
<tr>
<th>Study</th>
<th>Source</th>
<th>Treatment</th>
<th>Final Visual Acuity</th>
</tr>
</thead>
<tbody>
<tr>
<td>El-Asrar and Tabbara*</td>
<td>ECCE/IOL</td>
<td>PPV × 2</td>
<td>Hand motions</td>
</tr>
<tr>
<td>Ramaswamy et al*</td>
<td>Phaco/IOL</td>
<td>PPV</td>
<td>No light perception</td>
</tr>
<tr>
<td>Ambler et al*</td>
<td>Endogenous</td>
<td>PPV</td>
<td>Data not provided</td>
</tr>
<tr>
<td>Roussel et al* (case 3, present study)</td>
<td>Secondary IOL</td>
<td>Anterior vitrectomy, intravitreal antibiotics</td>
<td>Hand motions</td>
</tr>
<tr>
<td>Present study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case 1</td>
<td>Corticosteroid injection</td>
<td>PPV × 2</td>
<td>Hand motions</td>
</tr>
<tr>
<td>Case 2</td>
<td>ECCE/IOL</td>
<td>PPV × 3</td>
<td>No light perception</td>
</tr>
<tr>
<td>Case 4</td>
<td>Bleb related</td>
<td>Anterior vitrectomy, intravitreal antibiotics</td>
<td>3/200</td>
</tr>
<tr>
<td>Case 5</td>
<td>Corneal ulcer</td>
<td>Penetrating keratoplasty</td>
<td>Light perception</td>
</tr>
</tbody>
</table>

Abbreviations: ECCE, extracapsular cataract extraction; IOL, intraocular lens; Phaco, phacoemulsification; PPV, pars plana vitrectomy.

Table 2. *Mycobacterium chelonae*: Antibiotic Sensitivities*

<table>
<thead>
<tr>
<th>Class of Antimicrobials</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycopeptides (eg, vancomycin)</td>
<td>Usually ineffective</td>
</tr>
<tr>
<td>Cephalosporins</td>
<td>Usually ineffective (cefotaxime may be useful)</td>
</tr>
<tr>
<td>Macrolides</td>
<td>Usually effective (azithromycin, clarithromycin)</td>
</tr>
<tr>
<td>Aminoglycosides</td>
<td>Usually effective (amikacin, tobramycin)</td>
</tr>
<tr>
<td>Fluoroquinolones</td>
<td>Sometimes effective</td>
</tr>
<tr>
<td>Amphotericin B</td>
<td>Ineffective</td>
</tr>
<tr>
<td>Sulfonamides</td>
<td>Usually ineffective</td>
</tr>
</tbody>
</table>

*Data from Gilbert et al* and Brown and Wallace. All of the classes of antimicrobials listed were used in the present study patients.

Comment. In the present series, several categories of endophthalmitis are represented: (1) acute-onset postoperative endophthalmitis, (2) chronic or delayed-onset postoperative endophthalmitis, (3) endophthalmitis associated with glaucoma surgery, (4) endophthalmitis associated with a perforated corneal ulcer, and (5) intravitreal injection of triamcinolone. The 2 cases that occurred after anterior segment surgery each were notable for the presence of white opacifications of the capsular bag or anterior vitreous face, leading to initial misdiagnosis as *Propionibacterium acnes* or fungal endophthalmitis. Other authors have noted white opacities of the lens capsule or vitreous in cases of *M chelonae* endophthalmitis.

*Mycobacterium chelonae* endophthalmitis is generally associated with poor visual acuity outcomes (Table 1). No patients in previous reports or the current series achieved visual acuity of 20/400 or better. Many eyes developed chronic hypotony or underwent enucleation or evisceration.

The preferred antibiotic for *M chelonae* remains uncertain, but amikacin is usually considered as the first-line antibiotic of choice (Table 2). In the present series, the cultured organism was sensitive to macrolide antibiotics (sensitivity was tested to clarithromycin in 4 cases and to erythromycin in 2 cases). However, the cultured organism was sensitive to amikacin in only 2 cases, was intermediate sensitive in 1 case, and was resistant in 1 case (sensitivity to amikacin was not tested in 1 case). In a recent case series of nontuberculous mycobacterial kera-
Biotic therapy. Intravitreal clarithromycin has been reported to be non-toxic to rabbit eyes up to a dose of 1.0 mg; to our knowledge, the use of intravitreal clarithromycin in humans has not been reported.

In summary, M. chelonae is an uncommon cause of endophthalmitis. It is associated with a chronic course of marked intraocular inflammation and, in some cases, a white plaque inside the capsular bag in eyes after cataract surgery. While macrolide antibiotics may show good in vitro efficacy against M. chelonae, endophthalmitis caused by this organism has generally poor visual acuity outcomes.

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Endogenous Endophthalmitis After Routine Dental Cleaning

Hematogenous dissemination of microorganisms to the eye is an uncommon cause of endophthalmitis. Studies1-3 have reported that it accounts for 2% to 8% of all forms of endophthalmitis. For patients with symptoms of uveitis who have a history of systemic or focal infections or evidence of an immunocompromised state, endogenous endophthalmitis falls readily into the differential diagnosis. However, in an immunocompetent individual without evidence of systemic infection, the diagnosis requires a high index of suspicion.

Report of a Case. A 48-year-old woman underwent a routine dental cleaning before development of eye symptoms. She had no history of gingival disease or cavity fillings. At initial examination 10 days later, she had sharp pain and photophobia in the right eye. She had no significant ocular history. Her medical history was remarkable for hypertension, asthma, osteoporosis, and fibromyalgia.

On examination, corrected visual acuity was 20/200 OD and 20/20 OS. Intraocular pressures were 21 and 19 mm Hg, respectively. The anterior segment examination was significant for conjunctival hyperemia, fine keratic precipitates, the absence of iris nodules, and nuclear sclerosis in the right eye. The posterior segment was remarkable for vitreous haze secondary to cellular reaction and 3 areas of intraretinal hemorrhages with marked arteriolar sheathing (Figure 1). The left eye examination was unremarkable.

A tentative diagnosis of uveitis and retinal vasculitis was made, and the patient was started on topical corticosteroids and cycloplegics. At 3 days’ follow-up examination, her vision had worsened to hand motion, she had developed a hypopyon, and there was no view of the fundus (Figure 2). She was then admitted to the hospital and underwent a vitrectomy with biopsy and injection of vancomycin hydrochloride (1 mg/0.1 mL) and amikacin sulfate (400 µg/0.1 mL). Cultures were positive several days later for α-hemolytic streptococci. A thorough medical workup in search of a nonocular site of infection was negative.

She subsequently developed a macular hole, for which she underwent vitrectomy with gas injection. To date, she is free of infection and maintains a best-corrected vision of counting fingers at 0.9 m.

Figure 1. Fundus photograph of endogenous endophthalmitis. Note the cloudy appearance of the fundus secondary to vitreous haze, yet still showing impressive arteriolar sheathing.


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