Unusual Case of Acute Orbital Cellulitis

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Acute orbital cellulitis is a formidable, usually unilateral disease characterized by orbital swelling, lid edema, chemosis, injection, proptosis, and pain. The most common cause in infants and children is the extension of paranasal sinusitis. A patient with acute orbital cellulitis secondary to long standing uveitis and retinal detachment is presented. Other etiologic possibilities are reviewed.

CASE REPORT

A three and one-half year-old Mexican-American female was referred to the Department of Ophthalmology, University Hospitals, because of probable orbital cellulitis OS. At age six months, a "white spot" was noted in the left pupil which slowly enlarged. At age three, an ophthalmologist made the diagnosis of cataract and advised follow-up examination in one to two years. Three days prior to admission to University Hospitals, the patient suddenly developed a painful, swollen left orbit. No history of trauma, illness, or medications was obtained. The general medical history was unremarkable.

On examination, the left eye was proptotic, firm and tender to palpation. There was moderate orbital swelling with chemosis and injection of the globe. Slit lamp examination after sedation revealed a hazy, edematous cornea. The anterior chamber was subtotally filled with old and new blood. Examination of the pupil, lens, vitreous, and retina were precluded by the hazy media. The extraocular rotations of the left eye were limited. Preliminary echography revealed a dense membrane extending from the anterior vitreous to the posterior pole. No tumor could be identified.

Admission physical examination was performed with particular attention devoted to detecting any systemic or local process which could cause orbital cellulitis. The patient was well developed, well nourished and appropriately distressed by the left orbit. Rectal temperature was 37.9 C, respirations 16 and the pulse rate 100 per minute. There were no facial infectious processes or lesions to suggest trauma. Nuchal rigidity was absent. The lungs and heart were clear.

A skull x-ray series with emphasis on the paranasal sinuses was interpreted as normal. A chest x-ray was normal. The hemoglobin was 10.4 gm and the red blood cell count 3.7 x 10^6. The white blood cell count was 10,300. The differential showed polymorphonuclear leukocytes 62, lymphocytes 30, and monocytes 8. The urinalysis was negative. A small number of coagulase negative S. epidermidis were cultivated from the conjunctiva OS.

Examination under anesthesia revealed 3-4 mm of proptosis with protruding chemotic and ecchymotic conjunctiva. The cornea was hazy with a large amount of blood in the anterior chamber. The pupil was poorly seen but was noted to have a white mass behind it. Mackay-Marg measurements of intraocular pressures were OS 50 mm Hg and OD 26 mm Hg. An A-scan and B-scan echography revealed: (1) total umbrella shaped retinal detachment with a clear subretinal space; (2) cyclitic membranes and debris posterior to the lens; (3) lens thinning (1.6 mm OS vs. 3.9 mm OD); (4) shallow anterior chamber (1.2 mm OS vs. 3.1 mm OD); (5) diffuse orbital and lid edema, particularly superiorly; (6) axial length: OS — 19.5 mm, OD — 23.4 mm (normal for patient’s age 22.3 mm).

The clinical impression was probable persistent hyperplastic primary vitreous with long standing secondary degenerative changes leading to sterile panophthalmitis and orbital cellulitis. As the eye was painful and irreparably blind, it was enucleated. A 14 mm acrylic ball was implanted. Examination of the right eye was within normal limits.

Postoperatively, the patient did well with rapid regression of the orbital swelling OS.

Pathology Report

Gross: The globe measured 21 x 21 x 21 mm and did not transilluminate. There was a deep anterior chamber with the iris adherent to the anterior surface of lens. The retina was totally detached (Fig. 1).

Microscopic: The cornea epithelium was absent in most areas. The stroma and Descemet membrane were normal. Few endothelial cells were seen.

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suggesting chronic uveitis or endophthalmitis. The anterior chamber was deep with many new red blood cells, pigment granules, neutrophils and macrophages in the chamber angle. The lens was cataractous and showed cortical and nuclear liquefaction. The iris was adherent to the anterior lens surface with squelusion and occlusion of the pupil and iris bombé (Fig. 2). The ciliary body was atrophic. The retina was totally detached and disorganized. A ringschweile was noted indicating the retinal detachment was of long standing duration (Fig. 3). Red blood cells, neutrophils, monocytes and pigment granules were present in the vitreous cavity and subretinal space. The choroid, sclera, and optic nerve also contained neutrophils and monocytes (Fig. 4).

In summary, the eye had a total retinal detachment with signs of both acute and chronic uveitis. We postulate that the orbital cellulitis was secondary to events initiated by a long standing retinal detachment.

DISCUSSION

We are unable to explain the lack of a more dense acute inflammatory cell infiltration in the globe sections. Our inability to diagnose any extraorbital swelling after enucleation speak strongly for an intraocular cause of the patient's orbital cellulitis. Perhaps, there were degenerative breakdown products which induced a predominantly exudative as opposed to cellular response.

Causes of acute orbital cellulitis in addition to extension of paranasal sinusitis include expansion of processes from adjacent structures other than paranasal sinuses, ocular and orbital disorders, and orbit involvement by systemic disease (Table I).

Facial soft tissue infections, dental abscesses, and meningitis are affections of nearby structures which may break into the orbit. Similarly, rhabdomyosarcoma of the middle ear may cause cavernous sinus thrombosis and subsequent orbital cellulitis. Vascular spread of nasal fungal infections to the orbit is not rare in debilitated patients, particularly those with acidosis or blood dyscrasias.

Spontaneous necrosis in a retinoblastoma must be suspected in any child with acute orbital cellulitis. Necrosis, infarction or thrombosis of orbital tumors such as hemangiomas or rhabdomyosarcomas are other neoplastic considerations. Seemingly minor trauma, perhaps associated with an occult intraocular foreign body may result in an acute orbital process. Rupture of orbital or lid dermoid cysts often provokes an intense inflammatory response. Hordeola and other lid infections such as those resulting from various types of bites, most frequently insect or dog, may extend posteriorly. Rarely, orbital cellulitis is seen as a complication of strabismus surgery. The onset of inflammatory pseudotumor is generally insidious but it may be acute and mistaken for orbital infection. The chronic granulomatous inflammations such as syphilis, tuberculosis, sarcoidosis, parasites, granuloma of Wegener, etc., must be considered, because infrequently their onset may be rather acute. Dacrocystitis extending posteriorly is also a possibility.

Acute orbital cellulitis has been reported in patients being treated with immunosuppressive drugs for a variety of systemic diseases. Systemic viral infections including mumps, varicella herpes zoster and metastasis from bacterial endocarditis are other possibilities.

In evaluating the young patient with acute orbital cellulitis, sinus x-rays, otofaryngology evaluation, thorough pediatric examination, and perhaps a dental consultation must be
considered. The ophthalmologist should be especially alert for evidence of trauma. A careful intraocular examination for retinoblastoma is mandatory. Ultrasound is of inestimable value in orbital evaluation and in assessing the intraocular status when media clarity precludes good visualization.

SUMMARY

A three and one-half year-old female who presented with orbital cellulitis and leukocoria is described. Enucleation was performed as the eye was microphthalmic, blind, and painful. Histopathologic study revealed uveitis with total retinal detachment. The etiology of the retinal detachment was indeterminable. The differential diagnosis of orbital cellulitis in children is reviewed.

REFERENCES


