Orbital Infection Threatening Blindness Due to Carious Primary Molars: An Interesting Case Report

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Abstract

Introduction Distant spread of infection due to dental abscess in head and neck region is often reported in the literature. Orbital cellulitis or abscess although rare as a complication from decayed primary teeth in children is not an exception. The periapical infection from the maxillary primary molar spreads easily to the maxillary sinus first and followed by entry into the orbit through the orbital floor or through the ethmoidal sinuses. This if untreated may lead to orbital abscess, proptosis, progressive loss of vision, intracranial extension and even death.

Materials and Methods A 10 year old boy presenting with severe pain, proptosis of right eyeball, ophthalmoplegia and blindness.

Conclusion Managed successfully with timely medical and surgical intervention with complete restoration of vision. This case presented emphasizes the primary teeth care necessary in children which if unchecked can cause fatal complications.

Keywords Orbital cellulitis · Maxillary sinusitis · Primary teeth caries · Cavernous sinus thrombosis · Acute orbit · Odontogenic infections

Introduction

Dental caries is a rapidly emerging oral health problem amongst the children of India. Its incidence in different states varies from 31 to 89 %. Out of them, nearly 85.07 %

children require dental treatment. Untreated dental caries in children causes both pain and infection [1, 2]. The prevalence of dental pain was found to be 48 % in a survey of 8 year old children in Harrow, England due to dental sepsis [3]. The persistent mild chronic infection may damage the developing successor teeth and alveolus. The acute periapical infections may lead to rare complications like orbital cellulitis or orbital abscess with impairment or loss of vision [4, 5]. If untreated, can cause cavernous sinus thrombosis and or brain abscess ending in death [6, 7].

Case Report

A 10 year old boy first reported to the department of ophthalmology with a painfully bulged right eye and impaired vision since 2 days (Fig. 1). His general condition was poor with disturbed sleep and appetite, febrile (99° F), respiratory rate of 28/min, heart rate of 84/min. On examining, the right periorbital swelling was evident with proptosis (>8 mm), severe chemosis, pupils fixed and non-reactive, frozen eyeball—total ophthalmoplegia. Fundus examination revealed a pale disc for the right eye, left eye was normal. A diagnosis of orbital cellulitis was made and patient started on Inj. Vancomycin 500 mg iv/tds, Inj. Meropenam 500 mg iv/tds, Inj. Metrogyl 35 ml iv/tds, Inj. Efficolin 2 mg iv/stat, Inj. Mannitol 150 ml iv/bid, Inj. Rantac (ranitidine) 50 mg iv/bid, Dortas-T (20 mg dorzolamide + 5 mg timolol) eye drops 4th hourly. ENT reference and nasal endoscopy reported as middle turbinate hypertrophy with polypoid changes with congestion and mild DNS towards right side. Patient was referred for orbital CT scans (Fig. 2), which reported right maxillary sinusitis, right cheek cellulitis extending into right orbit into extra-conal compartment at supero-medial and infero-lateral aspects, resultant right eyeball proptosis,

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Fig. 1 Severe proptosis, poor vision, chemosis and swelling in the right cheek

Fig. 2 Images on CT scan showing the shift in globe along with optic nerve position with fluid accumulation of fluid filled in extraconal space

conjunctival and eyelid inflammation. Patient was then referred to oral and maxillofacial surgery, where the carious primary upper first and second molar were discovered with vestibular obliteration. The etiology was established as dental caries in primary upper right molars leading to acute periapical abscess, secondarily involving the maxillary sinus, infraorbital region and extension into the medial and superior orbital cavity causing protrusion of the eyeball with impaired vision. An emergency surgical drainage was planned after a diagnosis of subperiosteal orbital abscess was made. Under general anesthesia, the carious primary teeth were removed and maxillary sinus was explored through a Caldwell Luc approach (Fig. 3). Moderate quantity of pus was evacuated and sinus lavage was done carefully without damaging the permanent teeth buds. The infraorbital abscess was drained with a stab incision at the most dependent area and pus was drained. An inferio-medial incision was made just below the right eyebrow and the medial, inferior and superior orbital walls were explored and about 10 ml of thick yellow pus was drained (Fig. 4). The antibiotics were continued for a total of

Fig. 3 The extracted deciduous teeth with caries

Fig. 4 The orbital cavity exploration and decompression through supero-medial incision above the attachment of medial canthal ligament

10 days. The Inj. Mannitol and steroid injections were stopped on the second post-operative day. In subsequent follow-up patient showed a good recovery with return of vision as the inflammation and proptosis reduced. Patient was discharged with instruction for eye care. Three months after, patient had recovered his lost vision and eye ball movements completely without any residual ophthalmological complications (Fig. 5).

Discussion

The odontogenic infections spread through the path of least resistance which is determined by the muscle attachments in relation to the teeth and fascial planes. In children, the most common etiology found in literature for orbital abscess is maxillary or ethmoidal sinusitis. The maxillary

Fig. 5 Three months followup with complete resolution of ophthalmic complications and restored vision

teeth infections are known to involve the sinuses and reach distant sites cranially by following routes (a) Maxillary sinus to inferior orbital fissure and orbit. (b) Infection through pterygopalatine or infratemporal fossa, inferior ophthalmic vein via pterygoid venous plexus. (c) Valveless communication between ophthalmic vein, angular vein, supratrochlear and supraorbital veins. (d) Perforating through the eyelid, preseptal space and entering the orbit [5]. In our case the infection spread at the apex of carious primary molars, involving the maxillary sinus and the orbit perforating through the thin orbital floor/inferior orbital fissure. It then possibly perforated the presepta anteriorly and collected at the lower eyelid, as history suggested that the proptosis/chemosis appeared first followed by swelling of lower eyelid.

Allan et al. [8] in their review have mentioned five different orbital complication based on the site involved as (1) preseptal cellulitis (2) orbital cellulitis (3) orbital subperiosteal abscess (4) orbital abscess (5) septic thrombosis of the cavernous sinus. The case discussed here is considered to be of orbital abscess as a subperiosteal dissection did not yield any decompression and pus drainage was established only after a stab puncturing of periosteum. The microorganisms isolated from maxillary sinusitis of

odontogenic origin were unique in children, which constituted aerobic and facultative organisms in 11 %, anaerobes in 39 % and mixed in 50 % of cases [9]. In children aged between 9 and 14 years it is considered as transient stage of species of microorganism alteration. Before 9 years of age generally aerobes are commonly isolated from sinus infections of odontogenic origin and in adults it is usually the polymicrobial variety that dominates [10].

The treatment of orbital cellulitis is based on the severity and extent of spread of infection. Although conservative medical line of treatment is preferred first, a complication rate of 20 % and loss of vision in 14–33 % is observed [11]. In our case an initial empirical antibiotic therapy did not produce expected relief and hence had to perform emergency decompression procedure to avoid worsening of vision. Traditionally peri-orbital incisions are made to drain the abscess, but presently sinus/nasal endoscopic/computer aided surgeries are practiced as it avoids incisions on face [12–14].

The case presented here emphasizes the primary teeth care necessary in children which if unchecked and in presence of virulent bacterial flora can lead to distant spread of infections and associated mortality such as losing of vision and death.

Conflict of interest None.

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