CASE REPORT PROF-1399

UNCONTROLLED DIABETES MELLITUS;
ODONTOGENIC ORBITAL CELLULITIS

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ABSTRACT... Although there are many causes of orbital cellulitis and odontogenic orbital cellulitis is a rare entity but it is quite common in patients with uncontrolled diabetes. We present small series of patients with odontogenic orbital cellulitis and review the devastating visual outcome in patients with uncontrolled diabetes. Purpose of this report is to highlight the significance of ocular complications of dental infections which if not tackled promptly can lead to blindness especially if the patient is an uncontrolled diabetic. This case series also stresses upon the importance of dental hygiene and the proper sterilization of the dental surgical instruments which is not given due consideration in the developing countries like Pakistan.

Key words: Odontogenic, Orbital Cellulitis, Diabetes mellitus.

INTRODUCTION

Orbital cellulitis is an infection of the orbital soft tissues behind the orbital septum. It is an ocular emergency that threatens not only vision but also life from complications such as meningitis, cavernous sinus thrombosis and brain abscess[1, 2].

CASE 1

A 60 years old female (Pakistani) presented to us with left total ophthalmoplegia, one week after left upper molar tooth extraction. The visual acuity at presentation was no light perception in the left eye and finger counting in the right eye. Intraocular pressures were 12 and 26mm of Hg in right and left eye respectively. Right pupil was round, normally reacting to light and accommodation while the left pupil was fixed and dilated. There was dense cataract in both eyes. Anterior chamber was quiet and fundus view was hazy. Grossly there was proptosis of the left eye with chemosis and severe congestion. Extraocular movements in right eye were normal and left eye was a frozen orbit. The patient had high grade fever and blood sugar level was 550mg/dl. X- ray Paranasal sinuses revealed Pansinusitis.

CASE 2

Another (Pakistani) 45 years old female came with the

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history of tooth extraction 3 days back.

She had right total ophthalmoplegia with best corrected visual acuity in right eye was 6/36 and 6/18 in left eye.

Right pupil was mildly reactive and colour vision was impaired. Intraocular pressures were normal in both eyes. Fundus examination showed pre-proliferative diabetic retinopathy. The right eye was congested with mild proptosis. She was diabetic for the last 15 years and blood sugar levels were 350mg/dl. CT scan of the patient showed acute maxillary sinusitis with extension of the inflammatory tissues into the right orbit. (Fig. 1 and 2).

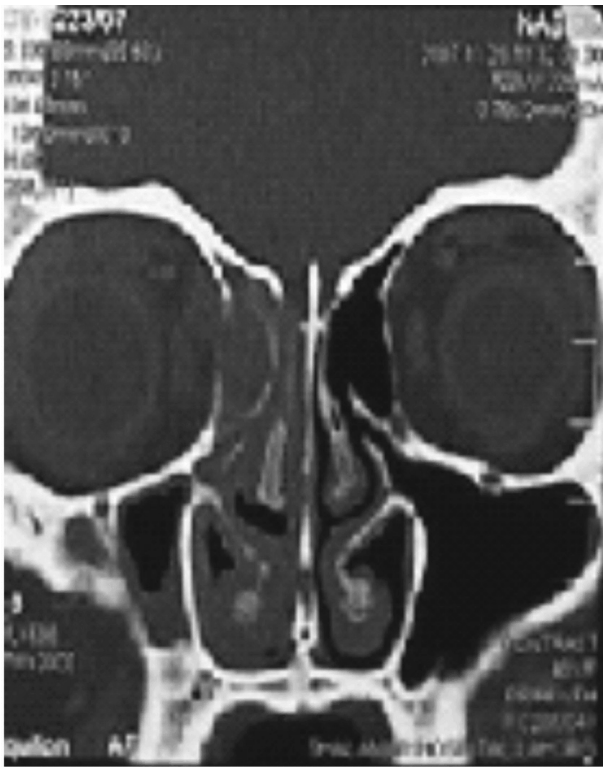

Fig-1. CT skull, coronal view. Right Maxillary, ethmoidal and Frontal sinusitis with extension of

CASE 3

A 65 years old (Pakistani) male presented with left total ophthalmoplegia one week after tooth extraction. He had all the systemic complications of diabetes mellitus. There was left proptosis with conjunctival chemosis and congestion. Best corrected visual acuity was finger counting in both eyes. Intra ocular pressures were normal in both eyes. There was early cataract and fundus examination revealed proliferative diabetic retinopathy. Blood sugar was 300mg/dl and he was taking oral antibiotics and analgesics for toothache.

Fig-2. CT skull, axial view of the same patient. Inflammatory process extending into the right orbit causing Proptosis.

CASE 4

A 67 years old (Pakistani) male came with a history of right upper molar tooth extraction after which he developed osteomyelitis. Maxillary bone debridement and sequestrectomy was done to remove the necrotic bone. The patient developed proptosis of the right eye with right hypertropia. Extraocular movements showed restriction of the inferior rectus. Best corrected visual acuity was 6/36 in the right eye and 6/24 in the left eye. There was cataract in both eyes and on fundus examination there was non-proliferative diabetic retinopathy with maculopathy. The patient was febrile. He was diabetic for the last 10 years (278mg/dl at the time of presentation).

CASE 5

A 25 years old male (Pakistani) patient had insulin

dependent diabetes mellitus. He had tooth infection which complicated into maxillary sinusitis. Maxillary sinus evacuation was done after which he developed ptosis, proptosis and right hypotropia the very next day. Extraocular movements were restricted in all directions. There was right RAPD and visual acuity was finger counting in right eye and 6/6 in the left eye. Intra ocular pressures were normal in both eyes. Fundus examination showed disc pallor in the right eye.

All the patients were admitted in the ward. The physician and the dentist were called for the control of diabetes and dental advice. They were put on insulin and given ceftazidime 1 gram intravenous three times a day and oral metronidazole 500mg 8 hourly to cover the anaerobes.

Proptosis and ocular congestion improved in all but the visual acuity improved in just one patient (case 2). Two patients (case 1 and 5) had irreversible optic nerve damage while the other three had diabetic retinopathy which could be accounted for the failure of visual acuity to improve. Follow up record of three months was found but the culture reports were not available.

DISCUSSION

Orbital cellulitis is a devastating ocular condition which threatens not only vision but also life from complications like meningitis, cavernous sinus thrombosis and brain abscess[1,2].

Chandler et al[3] classified orbital inflammation into five types.

1. Pre septal cellulitis
2. Orbital cellulitis
3. Sub peri osteal abscess
4. Orbital abscess
5. Cavernous sinus thrombosis.

In the pre- antibiotic series of Birch Hirachfield, 19% of cases died and 20% blinded in the involved eye[4]. Although this percentage is significantly reduced with the use of antibiotics but in developing countries and in uncontrolled diabetics this percentage is still quite high.

Two females and three males were retrospectively evaluated during the year 2007-2008. Four of them were non insulin dependent diabetics while one was insulin dependent young patient. The common features of these five patients were fever, orbital pain, proptosis, decreased visual acuity, restricted eye movements, increased leukocyte count, uncontrolled diabetes mellitus, history of tooth ache/tooth extraction (leading to paranasal sinus infection as confirmed on the radiograph and CT). Record of the culture reports was not available. Three patients had tooth extraction while the other two had sinus surgery (after odontogenic sinus infection). These patients presented to the ophthalmology department very late (ophthalmoplegia in four patients and inferior rectus restriction in one patient).Intraocular pressures were normal in four patients and raised in one. Two patients had dense cataract, one had early lens changes and the other two had normal lens in both eyes. The predisposition of teenagers and young adults to this complication has been reported by various authors[5,6]. In our series, four patients were more than 45 years of age and one was a young male of 25 years. It is because non insulin dependent diabetes mellitus usually presents in later age group.

Primary sinus infection which is the most common cause of orbital inflammation accounts for 64% of the cases of orbital cellulitis[7,8].Facial cellulitis leading to orbital cellulitis account for 16% of cases of orbital cellulitis. Odontogenic orbital cellulitis is a less frequent cause and account for 2 % of cases[9].

Dental infection as a cause of orbital cellulitis has been described since the times of Hippocrates[10]. In literature three basic routes of spread of infection have been described in odontogenic orbital cellulitis.

1. Paranasal sinuses
2. Pre maxillary soft tissues
3. Posteriorly via the infratemporal fossa and inferior orbital fissure[11,12].

The pathway of spread of infection can be determined by the location of the involved tooth. Maxillary incisors, canine and first pre molars lead to infection spreading through the pre maxillary soft tissues to the orbit.

Infection of the first molars on the other hand travels via maxillary sinus to the orbit[13]. This is probably due to the fact that the roots of the molars are close to the maxillary sinus and second molars being the closest[14].

Third molar infections usually spread via the masticator space and the infratemporal fossa, via the inferior orbital fissure into the orbit. The most common route is via para nasal sinuses and in all our five patients the route was through the maxillary sinus. The apices of maxillary molars and pre molars lie in close proximity to the floor of the maxillary sinus. The manifestation of spread of dental infection to the maxillary sinus has been termed endoantral syndrome[15].

Visual impairment[16] in orbital cellulitis occurs due to three mechanisms.

1. Optic neuritis secondary to inflammatory disease in orbit
2. Venous occlusion of the superior ophthalmic vein along with retrograde obstruction of venous return from the globe
3. Occlusion of ophthalmic artery due to odema in posterior orbit.

Chandler et al[3] have proposed that decrease in vision due to optic nerve occurs as a result of pressure on optic nerve and its vessels leading to hypoxic optic nerve damage. In our patients visual acuity improved in only one case (case 2, in whom it improved from 6/36 to 6/18). Out of the other four, two had irreversible optic nerve damage. The remaining two had diabetic retinopathy (proliferative diabetic retinopathy and non proliferative diabetic retinopathy with maculopathy) which could be accounted for the failure of visual improvement.

Radiograph is an important tool of diagnosis but CT scan is needed in severe cases.

Various predisposing factors for orbital cellulitis have been described in literature. These include nephrotic syndrome with antral inflammation, pregnancy with upper respiratory tract infection and heroin addiction[17]. Uncontrolled diabetes mellitus was the main predisposing factor in our patients which need further studies to be done.

In all these patients who had come to us with a complication of dental infection an accurate diagnosis and prompt treatment is necessary to prevent further spread of infection and neurological complications of orbital cellulitis. We were able to prevent further complications by controlling diabetes and by giving prompt antibiotic therapy but as the patients presented very late we were not able to recover the lost vision in four cases.

CONCLUSION

General practitioners and the dentists should be familiar with the manifestations of dental infection into the maxillary sinus and orbital area especially in diabetics. Though the course of odontogenic orbital cellulitis has been altered by the advent of antibiotics, significant morbidity and mortality is still seen in developing countries where the uncontrolled diabetics are commonly seen. This is due to ignorance, poverty, late seeking of the medical advice and under treatment on part of the patient. Health education and patient awareness programs regarding the complications of dental infection and control of diabetes is necessary.

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