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Endoscopic Management of Orbital Diseases of Sinus Origin: A case series

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Abstract

Rhinosinusitis with orbital complications is an emergency that not only threatens vision but also life. One of its serious complications is brain abscess.Antibiotic treatment may fail as this surgical intervention may be necessary and mandatory to perform an endoscopy.Four patients with orbital cellulitis over sinusitis were included in the study from 2013-2014. All of them did not respond to the medical administration and thus were conducted to them endoscopic sinus surgery, 3 of them had successful results and their health condition improved within one week of endoscopy, and one of them improved after the operation, but she had a relapse and died. We conclude that antibiotics do not treat and do not serve all pathological conditions, especially those that have complications.Excellent results and no major complications can be recommended for endoscopic sinus surgery.

Keywords:*rhinosinusitiscomplications,endoscopic sinus surgery ,pathological conditions.*

Introduction

Acute bacterial rhinosinusitis (ABRS)is one of the most common sinus diseases affecting the eye. It is a widespread disease, and the patient's symptoms may be severe or lead to complications. Complications of ABRS are rare but can be serious and even life threatening. Bacterial rhinosinusitis can spread outside the sinuses and nasal cavity into the orbit or directly surrounding tissues, or to the central nervous system (CNS) either directly or hematologically. The orbital manifestations are divided into pre-septal or post-septal infection[(1,2)].The incidence of invasive fungal sinusitis (IFS) has increased in recent years with increased use of steroids, the emergence of diabetes mellitus, and administration of antibacterial agents[(3)]. Contrast computed tomography (CT) remains the gold standard imaging study to assess the extent of orbital inflammation[(4,5)].Several studies have shown that rhinosinusitis symptoms improve after endoscopic sinus surgery (ESS)[(6)].

Methods

This was a retrospective study of four patients. The diagrams of patients treated for problems in the ophthalmic orbit arising from pathology in the sinuses were reviewed using the endoscopic approach through the nose in the ENT department of Kirkuk General Hospital in northern Iraq between 2013 and 2014, by Dr. Tunjai Namiq Faiq / Consultant ENT Surgeon. Written informed consent was obtained from all patients prior to surgery, in accordance with the ethical principles of the hospital.

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Presentations of the pathological cases

Case 1

History

A 14-year-old boy has a painful swelling of the right eye associated with a high temperature, headache, and vomiting.

On Examination

Proptosis(right eye), ocular movements were restricted but vision was normal (light perception). The pupillary reaction is normal with severe edema and redness of the upper eyelid. The left eye was mainly normal. Nasal endoscopy showed explicit purulent secretions from the ethmoid recess (Fig.1-a).

Investigations

Imaging / Computed tomography indicated right maxillary sinusitis with evidence of subperiosteal collection in orbit (Fig.1.b,c). Magnetic resonance imaging (MRI) of the orbit,brain and sinuses revealed a frightened exophthalmos with soft tissue swelling around the orbit associated with inflammatory mucosal thickening in the right sinus (Fig.1.d,e).

Bacteriology / A nasal swab was taken and culture and sensitivity showed staphylococcal infection.

Virology/ were negative .

Medical management/ An injection antibiotic was administered with Ceftazidime and Metronidazole.

Surgical management/Endoscopic sinus surgery was performed urgently partial removal of the medial orbital wall showed very good results (Fig.1.f)

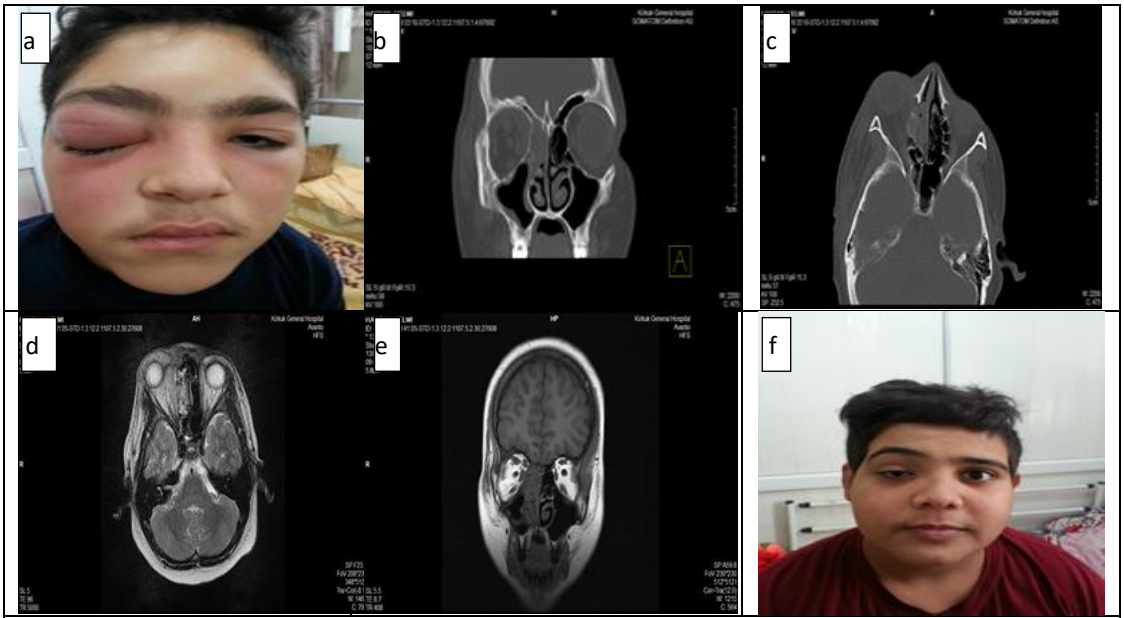

Figure 1:a)boy suffers from proptosis in right eye;b,c)CT scan demonstrating right sinusitis with subperiosteal collection in the orbit;d,e)orbital magnetic resonance imaging (MRI) of the brain and sinuses;f)result of endoscopic sinus surgery after surgical drainage.

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Case 2

History

A young man of 25 years, with asthma and nasal polyposis with complaints of painful swelling around the lateral part of the left eye, and he was operated on twice for nasal polyposis but with recurrence, with abscess drainage externally but again with recurrence.

On Examination / the eye was normal. Endoscopy showed a nasal cavity with extensive nasal polyposis (fig.2.a)

Investigations

Imaging / CT scan of the orbit and sinuses showed extensive involvement of the mucosa of the sphenoid sinuses, maxilla and ethmoid bilaterally with tearing of the roof of the orbit laterally ;no bones between the flour and the roof of the orbit laterally (fig.2.b,c).

Bacteriology/ *Staphylococcus aureus*.

Virology / negative.

Medical management / Antibiotic was given with Vancomycin, Cefriaxone, and Metronidazole.

Surgical management / Combined endoscopic and externalapproach (fig.2.d-k) .

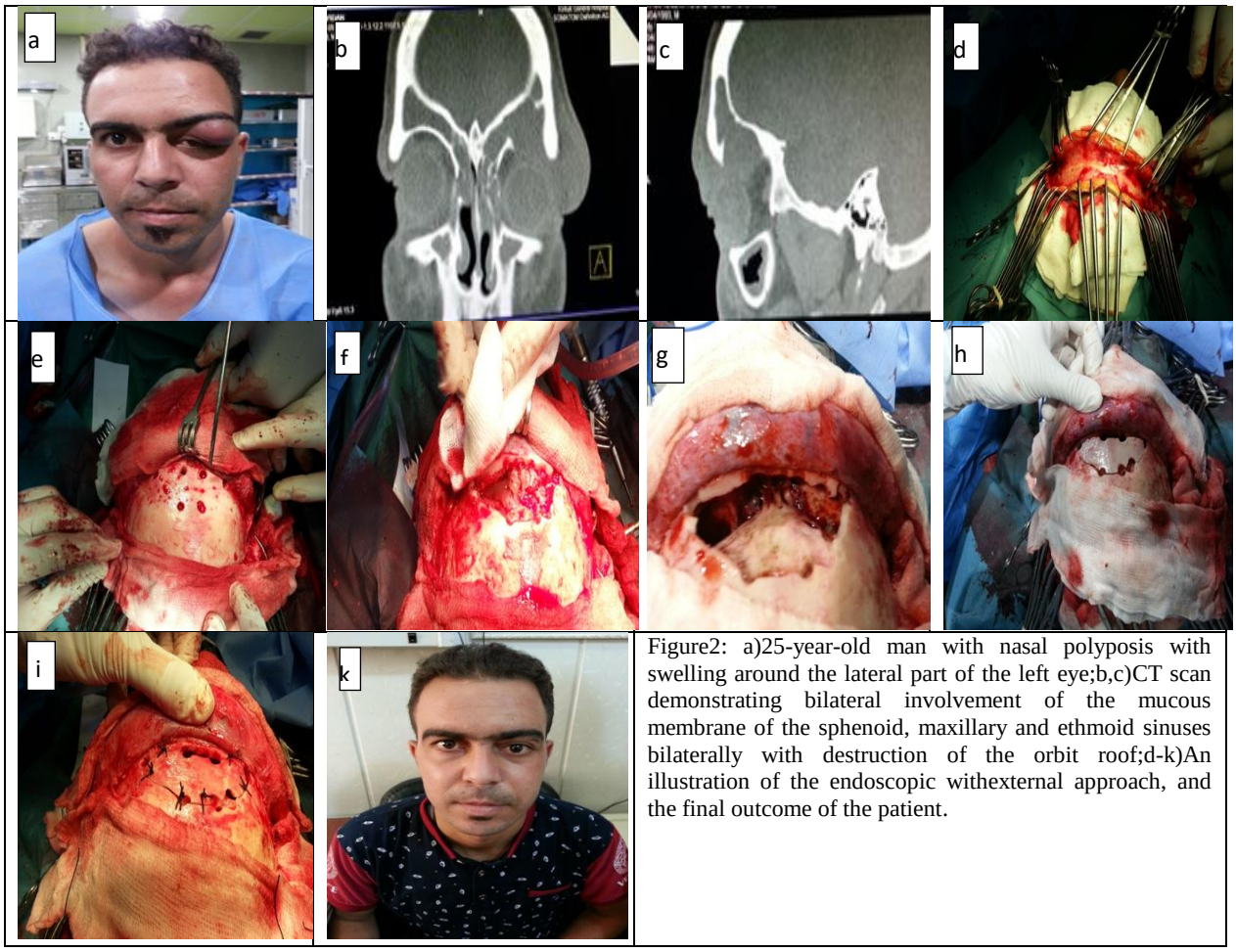

Figure2: a)25-year-old man with nasal polyposis with swelling around the lateral part of the left eye;b,c)CT scan demonstrating bilateral involvement of the mucous membrane of the sphenoid, maxillary and ethmoid sinuses bilaterally with destruction of the orbit roof;d-k)An illustration of the endoscopic withexternal approach, and the final outcome of the patient.

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Case 3

History

A 70-year-old woman with diabetes suffers from a painless swelling around the left eye, and an eye sideways downward horizontally.

On Examination/ there is swelling of the upper part of the orbit and sideways deviation of the orbit. Vision is normal. There are no restrictions on eye movements. Nasal endoscopy showed a lump in the middle meatus (fig.3.a).

Investigations

Imaging/ CT scan showed swelling of the upper medial wall of the orbit with the wall of the orbit dispersing into the upper medial segment causing the orbit to push sideways.

Bacteriology/ negative

Virology / negative

Medical management /without a role

Surgical management/ performing nasal endoscopic surgery with complete evacuation and return of the orbit to normal (fig.3.b).

Figure 3 :a)A 70-year-old woman complains of swelling in the upper part of the orbit and lateral deviation of the orbit. With a lump in the middle meatus; b)after surgical management and recovery

Case 4

History

A 65-year-old woman, who has an old case of diabetes (type 2), has complained of poor eyesight, swelling and inflammation of the right eye for two weeks.

On Examination / the right eye lost vision with exophthalmos. The pupil is fixed and dilated, and eye movements are restricted. An endoscopy revealed a nasal cavity filled with black scales (fig.4.a)

Imaging/ tomography showed the presence of soft tissue density contents in anterior and posterior ethmoid air cells, right front, maxillary, and sphenoid, and erosion of lamina papyracea and base of skull with right cavernous sinus invasion (fig.4. b, c).

Bacteriology/ negative.

Virology / negative.

Culture for fungus /positive forMucorales .

Biopsy / revealed feature of invasive mucormycosis **.**

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Medical and surgical managements/ The patient was initiated with intravenous insulin administration and was taken for endoscopic sinus surgery and orbital exenteration. Black secretions are found in the anterior maxillary, anterior ethmoid sinuses, and the right posterior sinus and all are evacuated. Antibiotic was administered after surgery with Amphotericin and Cefterixone injections. After the operation, the general condition began to improve and was discharged from the hospital two weeks after taking Amphotericin.But after a week of discharge, the infection began to appear strongly again and the patient died.

Figure 4 :a)A 65-year-old woman with poor eyesight, swelling and inflammation of the right eye with exophthalmos;b,c)Tomography of the peripheral nervous system showing the contents of soft tissue density, erosion of the lamina papyracea and the base of the skull with invasion of the right cavernous sinus.

Discussion

Orbital complication of sinogenic origin is an ancient disease that was described even during the days of Hippocrates[7]. Because of the orbit's proximity to the ethmoid, maxillary, frontal and paranasal sinuses, any sinus infection, if not diagnosed early and treated adequately, can spread the infection[8].The most acceptable classification to describe the orbital complications is the Chandler classification. It regulates the orbital complications in terms of progressive severity [9].Infections in pre-septal cellulitis include the skin of the eyelid in front of the orbital septum and the tarsal lamellar of the eyelids, while infections in orbital cellulitis, subperitoneal abscess, and orbital abscess include the orbit[10,11].Patients with pre-existing cellulitis will present with swelling of the eyelid and redness in the periorbital area but will not have interference into the orbit ,so they will not have any of the orbital signs which include impaired movement outside the eye, double vision, or bulging eyes.Patients with orbital cellulitis or abscess will have one or more orbital signs as a result of inflammation of the ocular muscles and intra-orbital fat.Orbital cellulitis is a serious infection that is often a clinical diagnosis and can appear as an ophthalmic emergency[12,13].Functional endoscopic sinus surgery (FESS) is a minimally invasive technique used to restore the ventilation and normal functions of the sinuses. It is the standard of care in medically recalcitrant chronic rhinosinusitis ,and up to 90% improvement in symptoms may be expected after the procedure[14,15].The ability to treat sinus disease has been revolutionized with optical fiber endoscopes and computerized tomography (CT) scans. Fiberoptic endoscopes make it possible to accurately examine the nose from the anterior openings to the posterior nasal space. The endoscopic procedure requires local anesthesia and can be performed in an office. Specific features that must be identified and evaluated during examination are the middle turbinate and middle meatus, anatomical obstruction, mucus and nasal polyps.Many advantages were provided by performing an endoscopy for these cases: the hospital stay was reduced, some potential complications of external approaches were avoided, and the physiological

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ventilation of the frontal sinuses was restored.With endoscopic surgery, the dead tissue is easily removed, and the duration of the surgery is shortened. This slowed the progression of the disease, and reduced the fungal load[18-20]. The main point to note is the extensive sinus clearance, resulting in better control of the infection and thus preventing its recurrence.

Conclusions

Many orbital diseases can have the origin of the sinuses, and endoscopic sinus surgery is easy, safe and can save patients' lives if it is performed in a timely manner.

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