

Involvement of superior rectus muscles in pansinusitis, a case report

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Abstract

• **AIM:** To report the involvement of extraocular muscles in a patient with pansinusitis.

• **METHODS:** A case report.

• **RESULTS:** A 43 years old man presented to eye clinic with a history of diplopia for a month. Ocular examination revealed right sided superior oblique and inferior rectus palsy or superior rectus restriction. Investigation with CT however revealed superior rectus thickening with surrounding pansinusitis. Drainage of ethmoid sinus and superior rectus recession was done to relieve the diplopia.

• **CONCLUSION:** Pansinusitis may involve extraocular muscles. Squint surgery may be required to relieve residual diplopia following surgical drainage.

• **KEYWORDS:** pansinusitis; diplopia; extraocular muscle; orbital inflammatory disease

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INTRODUCTION

Acute sinusitis is a relatively common problem; however, complications due to sinusitis are less frequently encountered. Sinusitis is commonly named after the anatomical site and more than one sinus involvement is termed pansinusitis. Complications of sinusitis are classified into orbital, soft tissue, osteitis, and intracranial^[1]. Orbital complications were further classified by Chandler into five groups: (1) preseptal cellulitis; (2) orbital cellulitis; (3) subperiosteal abscess; (4) orbital abscess and (5) cavernous sinus thrombosis^[2]. Inflammation of the extraocular muscles or orbital myositis is usually presented with painful ophthalmoplegia, redness and proptosis. We would like to report a case of atypical orbital myositis with no pain associated with subclinical pansinusitis.

CASE REPORT

A 43 years old gentleman presented with a complaint of

persistent diplopia of one month duration. It was worse on right gaze. This symptom was preceded by eye redness. He did not experience any ocular pain.

Visual acuity was 6/9 in both his eyes and intraocular pressure was 12 in both eyes. His head was noted to be tilted to the left side. There is mild hypertropia and ptosis over the right eye and bilateral mild exotropia. There was restriction of down gaze in the right eye, increased right hypertropia in the left gaze (Figure 1) and increased diplopia with right head tilt. Pupils were equal in size and reactive to light. Corneal sensations were intact. Biomicroscopy and retina examinations were unremarkable and there were no significant systemic abnormalities.

Hess test was done and showed under action of superior oblique and inferior rectus muscles with over action of left eye muscles, suggestive of long standing right depressor muscles palsy (Figure 2). Thyroid function test of T₄/TSH levels were in the normal range. CT orbit and brain revealed a solitary enlargement of right superior rectus muscle with pansinusitis (Figure 3). Further history from patient revealed history of nose block for more than a year but without pus discharge.

Patient was subsequently referred to the ENT team for further management. Drainage of the ethmoid sinus was done. He was also started on a course of systemic steroids to control the inflammation.

During follow-up, there was residual diplopia secondary to restriction from enlarged superior rectus muscle. Right superior rectus recession was done as he could not tolerate prism correction. Despite the squint surgery, although diplopia on primary gaze was relieved, there was still diplopia on right and down gaze.

DISCUSSION

The main contributing factor for orbital involvement in sinusitis is the close proximity of the orbital contents to the paranasal sinuses. Superiorly, the orbit forms the floor of the frontal sinus. Inferiorly, the roof of the maxillary sinus is medially separated from the ethmoid sinus by a paper thin lamina papyracea. The lamina papyracea contains three vertical fissures; the lacrimomaxillary, the lacrimoethmoidal, and the sphenothmoidal foramina where vessels and nerves travel. These structures may allow transmission of inflammation or infection from the ethmoidal sinuses to the orbit. There may also be congenital dehiscences in the orbital wall leaving only the orbital periosteum separating the orbital contents from the sinuses. Another factor for the involvement of the orbit in sinusitis is due to the valveless ophthalmic veins



Figure 1 Patient's extraocular movements.

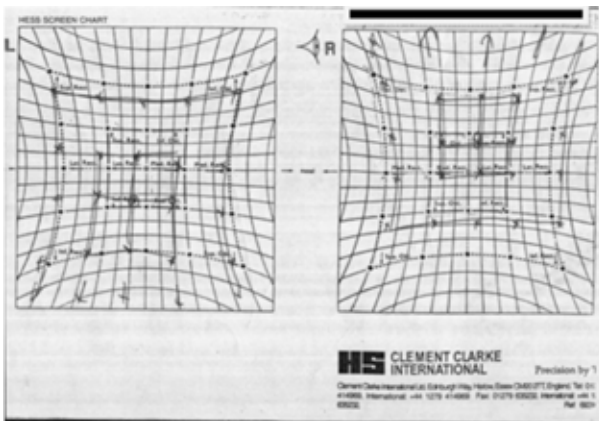


Figure 2 Hess Chart showing picture of long standing right superior oblique and inferior rectus weakness.

which communicates with the paranasal sinuses. The superior ophthalmic vein drains directly into the cavernous sinus and infection spread will cause cavernous sinus thrombosis. The incidence of orbital complications in sinusitis is in the range of 0.5% -3.9%^[3]. Orbital inflammation complicated by sinusitis is more commonly found in children^[4]. This may be due to the incomplete development of the paranasal sinuses and their thin bone barriers, and higher frequency of upper airway infection in this group. However, it is also found in all age groups. Males are more affected than females but the reason remains unexplained^[1,4].

Onset of disease may be acute, chronic and may recur. The cardinal clinical presentation of orbital myositis is painful ophthalmoplegia due to inflammation in the muscles. Pain may not be present as noted in some studies where it only presents in 58% -69% of the cases^[5,6]. The insidious and chronic nature of the disease may be the reason why our patient did not experience the pain. Literatures also showed that patients can have diplopia, proptosis, ptosis, periorbital and eyelid edema, conjunctival injection, chemosis, and, occasionally, a palpable mass and visual disturbances^[7,8]. More than one extraocular muscles may be involved, and rarely are both eyes affected. Judging from the anatomical relationship, the most commonly affected muscles should be the medial rectus, superior oblique, followed by the inferior rectus. However, cases in literature found the most frequently



Figure 3 CT scan showing thickened right superior rectus muscle, and pansinusitis.

involved muscle to be the medial rectus, followed by the superior rectus, lateral rectus, superior oblique, inferior rectus and inferior oblique muscles^[9]. Strabismus due to sinusitis was also attributed to cranial nerve palsies owing to cavernous sinus involvement^[2] or nerve damage from adjacent sinus surgery^[10,11]. The affected muscle may be parietic in the acute stage. Recurrent bouts of subacute sinusitis could cause progressive extraocular muscle fibrosis^[12,13]. Once muscle fibrosis has taken place, the patient will have restrictive ophthalmoplegia and usually need strabismus surgery to relieve them of diplopia^[12]. These patients are usually unaware of their sinus disease^[12]. As in our patient, the fibrosis of the superior rectus muscle had occurred causing restriction of down gaze, giving us the false impression of superior oblique and inferior rectus palsy.

Plain radiography could be used to diagnose sinusitis whereby presence of air-fluid levels, opacification or bony destruction could be visualized. Imaging of affected muscles by CT scan or magnetic resonance imaging (MRI) remains the gold standard. CT scan will reveal enlarged muscle bellies with indistinct margin and thickened tendons while fat-suppressed

T2-weighted MRI will reveal hyperintense signal of both the involved muscles and fascial structures during acute stage^[2,4,13]. A-scan echography could be done and there is low internal reflectivity of the extraocular muscles^[9].

The most common pathogens involved in acute suppurative sinusitis include gram positive organisms such as Haemophilus influenza, Streptococcus pneumonia, Staphylococcus aureus, and in adults, diplococcus pneumonia is the most common organisms^[2,3]. Systemic antibiotics and surgical drainage had been advocated in acute sinusitis, however, in chronic and subclinical disease, steroids had been advocated^[1,9,14]. Early treatment with steroids is recommended to prevent muscle fibrosis and degeneration^[6,15]. Patients who are aware of the sinus disease would present early and be treated promptly, thus chronic extraocular muscle fibrosis would not have time to develop. On the other hand, from the study by Lee *et al*^[7], they noted that a shorter interval between the onset of symptoms and surgery did not guarantee an earlier recovery in visual acuity. The recovery of vision depends on the severity of visual disturbance and the severity of the sinus disease^[7]. However, they noted that patients with diplopia generally have complete recovery. Our patient did not have a complete recovery possibly due to the severity of infection and late presentation with muscle fibrosis.

In conclusion, sinusitis can cause serious ocular complication. Early diagnosis and treatment are imperative to avoid or reduce recurrence and aggravation of the ocular complications. Clinician should be familiar with the diagnostic and therapeutic modalities for this condition.

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全鼻窦炎患者中上直肌牵连1例

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摘要

目的:报告1例全鼻窦炎患者中上直肌牵连情况。

方法:病例报告。

结果:患者,男,43岁,诉持续性复视1mo,检查示:右侧上直肌和下直肌麻痹,上直肌活动受限。CT检查:鼻窦周围上直肌增厚。筛窦穿刺或上直肌缩短可减轻复视症状。

结论:全鼻窦炎可以影响眼外肌活动。行穿刺手术后斜视矫正手术可以减轻复视症状。

关键词:全鼻窦炎;复视;眼外肌;炎性眼眶疾病