CASE REPORT

Midfacial paraesthesia - An unusual presentation in paranasal sinusitis

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Abstract

Facial paraesthesia is seen in variety of disorders, usually arising due to nerve compression or damage. Maxillary sinus pathologies could potentially impact the infraorbital nerve, causing numbness of the midfacial region. A 52-year-old male presented with right side facial numbness of 20 days duration with history of chronic headache and upper respiratory tract infection. An inadvertent endodontic therapy had been performed earlier on maxillary right central incisor providing no relief. Right maxillary sinus was tender on palpation. Nasal endoscopy showed purulent collection in right maxillary sinus. Computerized tomography para-nasal sinuses revealed right maxillary, sphenoid, and ethmoid sinus involvement with cortical erosion of infra orbital foramen. Remission was found on antibiotic therapy. Clinicians should recognize the underlying causes responsible for unusual symptoms of chronic sinusitis and a unilateral facial numbness could be the result of bony erosion due to underlying pathology.

Keywords
Infra orbital nerve, maxillary sinus, mid-facial paraesthesia, rhinosinusitis

Introduction

In general dental practice a patient presenting with sudden onset of facial paraesthesia is an unusual occurrence. The anterior maxillary sinus wall houses the infraorbital nerve, running through the infraorbital canal along the roof of the sinus innervating the skin and mucous membranes of the midfacial region. Traumatic or iatrogenic injury to this nerve may result in hypoesthesia, paraesthesia, or pain in this area. We describe a case of unusual presentation of unilateral infraorbital nerve paraesthesia due to chronic maxillary sinusitis.

Case Report

A 52-year-old male presented with history of right side facial numbness since 20 days. Patient had consulted a private dentist for the same and endodontic therapy was performed on maxillary right central incisor providing no relief. A 5 months history of recurrent episodes of headache, nasal discharge, cough with purulent sputum and nasal obstruction were elicited. He was a known hypertensive, under medication and a cigarette smoker for past 34 years.

On examination, tenderness was elicited on the right maxillary sinus region. Cotton wisp test showed no neurological deficits. Purulent rhinorrhoea was detected on the floor of left nasal fossa along with a thickened nasal septum. Maxillary right central incisor was root canal treated.

Intra-oral periapical radiograph of right maxillary posterior region revealed a diffuse radiopacity along the floor of the maxillary sinus [Figure 1]. Panoramic radiographic findings were non diagnostic [Figure 2]. Paranasal sinus view revealed opacification of right maxillary sinus [Figure 3]. A nasal endoscopic examination showed purulent discharge draining from right maxillary and sphenoidal sinus ostium [Figure 4]. Computed tomography (CT) of the paranasal sinus revealed a soft tissue density in the right sphenoid and ethmoid sinus with an attenuation of 21 HU causing obliteration of the ipsilateral osteomeatal unit [Figure 5]. Minimal mucosal thickening was noted in left maxillary sinus. There were morphological bony changes with cortical thickening and mild erosion of medial aspect of the right infra-orbital canal [Figure 6].

The above findings were suggestive of chronic maxillary, sphenoid and ethmoid sinusitis with erosion of right infraorbital canal leading to ipsilateral facial paraesthesia. Thus the diagnosis of chronic purulent maxillary sinusitis was confirmed. Patient was given oral antibiotic treatment with amoxicillin and clavulanic acid for 7 days along with mucolytics following which remission was achieved.
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Discussion

Paresthesia is a neurosensitivity disturbance caused by a lesion in the neural tissue, characterized by sensation of burning, numbness or twinging or by partial loss of sensitivity. Neuropathies can result in sensory, motor and or autonomic deficits in the affected region. Causes of cranial neuropathies can be classified as intracranial or extracranial. Intracranial causes include stroke, transient ischaemic attack and tumors. Extracranial causes include trauma, malignancy and infection. Iatrogenic causes of altered trigeminal nerve function include radiotherapy, chemotherapy and surgery. A variety of mechanisms have been postulated, but all ignore the fact that chronic maxillary sinusitis is a relatively rare but possible etiological factor.

Chronic rhinosinusitis (CRS) by definition is inflammation of the nose and paranasal sinuses with objective evidence of disease by radiographs or nasal endoscopy and with a duration of symptoms and signs for atleast 12 weeks.

Anatomic variations and other factors generally predispose patients to sinus infections. Viral upper respiratory infection is the most common precursor to bacterial rhinosinusitis, followed by sinus obstruction from the mucosal edema of inhalant

Figure 1: Intra oral periapical radiograph showing a diffuse radiopacity along the floor of the right maxillary sinus

Figure 2: Panoramic radiograph revealed root canal treated maxillary right central incisor with no significant periapical pathology

Figure 3: Paranasal sinus view showing haziness in the right maxillary sinus

Figure 4: Nasal endoscopy picture showing purulent secretions in the right maxillary sinus ostium

Figure 5: Axial computed tomography showing opacification of right sphenoid and ethmoid sinuses
allergies and by anatomic factors. Air pollution, most commonly tobacco smoke, can be an important cofactor. Less frequent causes include nasal polyps, medication side effects (e.g., rhinitis medicamentosa from abuse of topical vasoconstrictors or cocaine, mucosal edema from use of oral antihypertensive drugs), and mucociliary dysfunction associated with cystic fibrosis and immune deficiencies. The osteomeatal complex, the area at the confluence of drainage from the sinuses, is particularly vulnerable to inflammatory changes, swelling, and obstruction. The normal morpho-functional aspect of sinus mucosa depends on ostial permeability, ciliary function, and consistency of sinus secretions. Any change in these factors can irritate the mucosa of the paranasal sinuses and, by disturbing local homeostasis, can cause inflammation, swelling, mucociliary dysfunction, reduced airflow to complete obstruction and bacterial proliferation. It is considered that infections induce inflammation of the sinus mucosa that can extend to the jawbone causing osteitis, further complicating the symptoms and evolution of the disease. Bacterial biofilms especially *Staphylococcus aureus* and anaerobic bacteria may contribute to persistence, recurrence and severity of certain clinical forms of CRS.

CRS manifests more subtly and according to the diagnostic guidelines, major signs and symptoms are facial pain/pressure/fullness, nasal obstruction/blockage, nasal or postnasal discharge/purulence, hyposmia/anosmia and fever. Minor symptoms include headaches, halitosis, fatigue, dental pain, cough, ear pain, etc. The present case fulfills the diagnostic criteria of CRS with the presence of major and minor symptoms including facial pain, purulent nasal discharge, head ache and cough for a period of more than 12 weeks but with a rare presentation of facial paraesthesia.

Considering that there was significant improvement in signs and symptoms with antibiotic therapy, the etiological factor in the present case can be considered as bacterial origin. In addition to the infection and anatomic variation, smoking could have played an adjuvant role as an exogenous agent favoring conditions for growing of microbial pathogens. Our patient had a smoking habit history for almost 34 years. Studies on epithelial cell cultures, have shown that a toxic metabolite of nicotine called cotinine in cigarette smoke reduces epithelial cilia movement. Chronic exposure to tobacco smoke causes respiratory mucosal epithelium metaplasia with increased number and size of goblet cells and consequently, increased mucous secretion in the upper respiratory tract.

Diagnosis of paraesthesia is based on a complete medical history, with assessment of onset of symptoms. Periapical radiographs are essential to rule out any odontogenic lesions as possible etiological agents. Intraoral periapical and orthopantomogram in our case did not reveal any odontogenic pathologies in the maxillary arch and hence odontogenic infection could be ruled out.

Clinical guidelines regarding CRS focus on appropriate use of diagnostic tests. Nasal endoscopy allows visualization of the posterior nasal cavity, nasopharynx, and, in some instances, the sinus drainage pathways in the middle meatus and superior meatus. In the present case nasal endoscopy revealed purulent discharge from right maxillary and sphenoidal sinus ostium. The specificity of presence of mucopurulence for confirmation of CRS has implications for clinical practice. If endoscopy reveals mucopurulence, the indication for antibiotic administration becomes quite strong.

CT scan, performed in a coronal plane with cuts of 4 mm or less, is considered the gold standard for radiographic delineation of sinus. CT scan findings suggestive of chronic sinusitis includes mucosal thickening/sinus opacification, bone remodeling, polyposis, and bone thickening secondary to osteitis from adjacent chronic mucosal inflammation.

The CT of our patient supported the clinical diagnosis of chronic sinusitis with a soft tissue density within the right maxillary, ethmoid and sphenoid sinuses. Minimal mucosal thickening was noted in left maxillary sinus. Nasal septum showed deviation to the left. There were morphological bony changes with cortical thickening and mild erosion of medial aspect of the right infra-orbital canal secondary to sinusitis suggesting involvement of infra orbital nerve which must have contributed to unilateral facial paraesthesia.

The goals of medical therapy for CRS are to reduce mucosal edema, promote sinus drainage, and eradicate infections. If the diagnosis of CRS is confirmed the clinician should begin treatment with amoxicillin with or without clavulanate as first line of therapy for 5 to 10 days. For penicillin-allergic patients, folate inhibitors (trimethoprim-sulfamethoxazole) or a macrolide antibiotic may be used. If treatment failure is observed after 7 days of antibiotic therapy, a nonbacterial cause or infection with drug-resistant bacteria should be considered and should promptly switch to alternate antibiotic therapy and re-evaluation of the patient.

According to the clinical practice guideline update for adult sinusitis, clinicians should confirm the presence or absence of nasal polyps and recommend saline nasal irrigation, topical
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intranasal corticosteroids or both for the symptom relief in a patient with CRS.[10] The update group has also stated as options that clinicians may obtain testing for allergy and immune function in evaluating a patient with CRS and should not prescribe topical or systemic antifungal therapy in these patients.[10] Functional endoscopic sinus surgery is considered to be the surgical option in patients with CRS not responding to medical management. In the present case patient responded well to antibiotic therapy and was relieved of his symptoms with no recurrence.

**Conclusion**

Clinician should be aware of the various diagnostic possibilities, some of which are rare and unusual. We reinforce the importance of considering the range of differential diagnosis in all cases presenting with unilateral facial paraesthesia. Prompt clinical and diagnostic tests with radiological investigation for evaluation of the underlying cause and specific further management are relevant. CT scan plays a crucial role in depicting the extension of the lesion and its relation to adjacent anatomical structures in all possible directions.

**Clinical significance**

The present report describes a rare presentation of chronic maxillary sinusitis leading to unilateral facial paraesthesia. To our knowledge, there are very few similar case reports in literature. Patients with CRS have a substantial negative health impact owing to their disease, which adversely affects mood, physical functioning, and social functioning. The significance of this case is that this patient, was misdiagnosed as having an odontogenic infection and incorrectly managed with endodontic treatment.

**References**
