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Main Article

Prevalence of facial pain in 108 consecutive patients with paranasal mucopurulent discharge at endoscopy

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Abstract

We undertook a prospective observational study of 108 consecutive patients with endoscopic paranasal mucopurulent secretions. Only 31 patients (29 per cent) had facial pain. In 20 (65 per cent), the endoscopic site of purulent secretions corresponded to the site of pain. In those with facial pain, 74 per cent had nasal obstruction, 68 per cent had objective hyposmia and 84 per cent had mucopurulent rhinorrhoea. In the 31 patients with facial pain, 19 (61 per cent) became symptom free following medical treatment. The remaining 12 patients underwent surgery and their symptoms resolved, except for one patient with a tension-type headache and another with pain of unknown cause.

Most patients with purulent secretions from the paranasal sinuses do not have facial pain; therefore, chronic rhinosinusitis is not synonymous with pain.

Patients with sinogenic facial pain usually have endoscopic findings that correlate with the site of pain, and the majority also have other nasal symptoms. Chronic infective rhinosinusitis usually responds to medical therapy, and the remainder resolve with surgery.

Key words: Sinusitis; Facial Pain; Endoscopy; Nasal Cavity

Introduction

Chronic facial pain is often attributed to sinusitis, and many patients are therefore referred to the otorhinolaryngologist. Patients know that their sinuses are situated in the cheeks and forehead and therefore assume that pain emanating from these areas is caused by sinusitis. With the advent of nasal endoscopy and computerized tomography (CT), together with the realization that many patients do not experience an improvement of their pain following endoscopic sinus surgery, it has become apparent that this assumption is not always true.[1–3]

In patients with facial pain secondary to sinusitis, there are usually other stigmata of sinus disease in the history, including nasal obstruction, hyposmia and purulent nasal discharge.[4] Clinically, there are usually endoscopic signs of the disease, including mucosal oedema and, more significantly, mucopus.[5]

It has become apparent that a distinct group of patients exists in whom facial pain is the predominant symptom but positive endoscopic findings are absent. Midfacial segment pain is a form of facial neuralgia with all the hallmarks of a tension-type headache, except that it affects the midface.[6] Computed tomography scans are often normal. However, as 30 per cent of asymptomatic adults have mucosal abnormalities demonstrable on CT, incidental findings are not uncommon.[7–9]

The aim of this study was to examine the prevalence of facial pain and other nasal symptoms in patients with mucopus arising from the sinuses on endoscopy.

Materials and methods

The inclusion criteria were patients referred to a rhinology clinic, selected on the basis that they had endoscopic evidence of mucopus emanating from the sinuses. The exclusion criteria were patients with atypical infections, malignancy, ciliary dysmotility and those who were immunocompromised. Mucopus was not sent for microbiological examination unless an atypical or fungal infection was in question, as this was thought unnecessary in a study assessing facial pain.

Patients who complained of facial pain were identified and their presenting symptoms analysed in the light of the final diagnosis, made after treatment and follow up. The mean follow-up time for patients with facial pain was 7.5 months (range, four months to two years six months) and that for patients undergoing surgery was 13 months.

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Results

Of 108 patients who had mucopurulent nasal secretions at rigid nasal endoscopy, only 31 (29 per cent) complained of facial pain. The mean age of all the patients was 49 years (range, 23–77 years); 45 per cent were male and 55 per cent female. Twenty-three (74 per cent) of the patients with facial pain also complained of nasal obstruction, whilst 26 (84 per cent) reported mucopurulent nasal discharge. Eleven (35 per cent) patients also had nasal polyps. Twenty-eight patients could localize their pain and in 20 cases (65 per cent) this corresponded with the endoscopic site of the mucopus. In nine patients who had unilateral pain, seven had pus at rigid endoscopy, emanating from the affected side only. Twenty-eight patients underwent the Zurich smell test[10] and 19 (68 per cent) had objective hyposmia or anosmia.

All patients received a two-week course of a broad-spectrum antibiotic with anaerobic cover (co-amoxiclav or cefuroxime axetil and metronidazole) and a topical nasal steroid for six weeks, and all were advised to douche their nose. Two patients with nasal polyps received oral prednisolone as adjuvant therapy.

In the subgroup of patients with facial pain, 19 (61 per cent) were symptom-free following medical treatment and the remaining 12 underwent sinus surgery. Ten patients reported complete resolution of their symptoms following surgery. One patient did not gain any benefit from surgery and one patient was subsequently diagnosed with tension-type headache.

Examining the whole cohort of 108 patients, 77 patients (71 per cent) had no facial pain. Of these patients, 13 (17 per cent) had nasal polyps. All received medical treatment as outlined above, including two patients who were also prescribed prednisolone for nasal polyposis. In 20 (26 per cent) patients, medical treatment failed and these patients underwent surgery. Fifteen patients received endoscopic sinus surgery, three received sinus washouts, one had a rhinolith removed and one underwent intranasal polypectomy. Of those patients who underwent endoscopic sinus surgery, one had aspergillosis and another also underwent a dental extraction to relieve the cause of their maxillary sinusitis. All patients who had surgical intervention experienced an improvement in their symptoms, although seven complained of catarrh or a post-nasal drip.

Discussion

Facial pain is often attributed to sinusitis. Acute infective rhinosinusitis is typically unilateral, short-lived and follows an upper respiratory tract infection. Chronic infective rhinosinusitis has been assumed to be a major cause of chronic facial pain in many patients. It is defined as inflammation of the nose and paranasal sinuses for 12 weeks or more and is characterized by two or more of the following symptoms: nasal blockage or congestion, discharge, reduction or loss of smell, and facial pressure or pain, together with either endoscopic signs of disease and/or CT changes.[11] Other causes of facial pain include tension-type headache, midfacial segment pain, atypical forms of migraine, atypical facial pain, cluster headache and paroxysmal hemicrania.[6] It is becoming increasingly accepted amongst otorhinolaryngologists that neurological causes of facial pain account for a significant proportion of patients' symptoms,[12,13] especially when there is an absence of other stigmata of sinus pathology.[3] Those patients without nasal symptoms are very unlikely to be helped by nasal medical or surgical treatment.[2]

The European position paper on rhinosinusitis and nasal polyps states that the research data available on the medical and surgical treatment of chronic rhinosinusitis are limited as the disease is poorly defined and is therefore difficult to interpret clearly.[11] Current medical treatment includes topical nasal steroids (either alone or in combination with nasal douches) and oral antibiotics for acute exacerbations. Endoscopic sinus surgery has been described as effective in the treatment of facial pain secondary to genuine chronic rhinosinusitis after failure of medical treatment,[12,14–21] and has been shown to alleviate facial pain due to sinusitis in 75–83 per cent of such cases.[2,12] In our subgroup of patients with facial pain, 19 (61 per cent) became symptom free following medical treatment directed at the paranasal sinuses, while 12 (39 per cent) failed to respond and underwent sinus surgery. Of these 12 patients, 10 (83 per cent) reported complete resolution of their symptoms of facial pain following surgery. One patient gained no benefit, and another was subsequently diagnosed with tension-type headache.

A key observation is that the majority (71 per cent) of patients with endoscopic signs of mucopus emanating from their paranasal sinuses did not have facial pain; therefore, chronic infective rhinosinusitis is not synonymous with facial pain. In a previous study of 679 patients with evidence of sinogenic pathology at anterior rhinoscopy, endoscopy or CT (from an original cohort of 973), only 119 (18 per cent) complained of facial pain. In the same study, of those 119 patients, only 76 (11 per cent) had pain attributable to sinonasal disease.[2]

This study confirms previous reports that the majority of patients who complain of facial pain due to genuine chronic infective rhinosinusitis have other associated symptoms and signs, namely, nasal obstruction, hyposmia and mucopurulent discharge confirmed at endoscopy. Another relevant finding from our data was that localized facial pain, where present, correlated with endoscopic findings.

Stammberger and Wolf postulated that variations in the anatomy of the nasal cavity result in mucus stasis, infection and, ultimately, facial pain.[16] They also postulated that contact between two or more mucosal surfaces may stimulate nociceptive fibres via the substance P neurotransmitter. This has never been scientifically proven,[22] although several authors have used this model to explain how anatomical variants causing mucosal contact points may be responsible for facial pain.[23–26] A review of the literature showed that there is no evidence for a

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consistent difference in the prevalence of anatomical variations between a symptomatic and a control group, and it is likely that host immunity and virulence of the infective agent are key. The overall evidence in support of theories linking facial pain and contact points is poor.[27]

Mucosal abnormalities are apparent on CT scans in approximately 30 per cent of asymptomatic adult patients;[7–9] the percentage is even higher in asymptomatic children.[28–33] Incidental abnormalities on magnetic resonance imaging (MRI) are also seen in asymptomatic adults (31–39 per cent) and children (45 per cent).[34,35] Ide *et al.* reported that thickening and sclerosis of the bony sinus wall were more sensitive predictors of rhinosinusitis than mucosal thickening alone.[36] From this evidence, it is advisable not to operate based on CT or MRI appearances alone, particularly in the absence of nasal symptoms and purulent secretions at endoscopy.

Cook *et al.* reported that, in 18 patients with no CT or endoscopic evidence of sinus disease who underwent sinus surgery for facial pain, 12 reported a significant reduction in their symptoms.[37] Nonetheless, no patient was completely symptom free at follow up. Similarly, Parsons and Batra retrospectively described 34 patients with headaches who had contact points surgically excised; they found that, post-operatively, although there was a 91 per cent reduction in intensity and an 84 per cent decrease in frequency, 65 per cent of patients still had persisting symptoms.[38] It would be anticipated that, if subjects' pain was secondary to obstruction of the ostia, then surgery would largely, if not completely, resolve this pain. The result of surgical treatment is thought to be influenced by the placebo effect, cognitive dissonance and spontaneous resolution.[39,40] Surgery can temporarily relieve the symptoms of facial pain in midfacial segment pain and tension-type headache in approximately one-third of patients.[41] This temporary relief from pain may possibly be due to the neurological stimulus of surgery causing neurological changes or neuroplasticity, resulting in a temporary alteration to the caudal nucleus of the trigeminal nerve.[39,42] Whilst surgery can temporarily help one-third of patients, it can make the pain worse in the same proportion. Long term follow up has revealed that, in the vast majority of patients who do have some initial response, their pain returns within one year.[2]

An understanding of the neurological basis for tension-type headache has been gained from the studies of the Copenhagen group.[43–47] Central sensitization of the trigeminal nucleus through an increase in myofacial nociceptive input or neurological or psychological factors which are thought to suppress supraspinal inhibition may account for the symptoms of pressure that are often interpreted as pain.[39,42]

Attempts have been made to categorize the causes of facial pain according to aetiology, symptoms and clinical signs, with the aim of offering the best treatment modality for each condition. The degree of overlap between various symptom complexes is considerable. In practice, a proportion of patients cannot be pigeon-holed into one distinct diagnostic group, and treatment selection becomes more empirical.[6]

- **Only a minority of patients with chronic infective rhinosinusitis have facial pain, but they do have other nasal symptoms and endoscopic evidence of disease**
- **Patients with chronic infective rhinosinusitis who can localize their pain usually have pus located in the same area at endoscopy**
- **The majority of patients with chronic infective rhinosinusitis complain of nasal obstruction, hyposmia or mucopurulent nasal discharge**
- **An absence of endoscopic and CT evidence of paranasal sinus secretions is indicative of non-sinogenic pain**
- **There are many causes of facial pain other than sinusitis**

Midfacial segment pain has all the characteristics of tension-type headache, with the exception that it affects the midface and for this reason is assumed to be sinusitis by both patients and doctors alike.[6] Atypical facial pain is a diagnosis of exclusion. Many patients exhibit psychological disturbance, depression and other chronic pain syndromes. The facial pain they describe is often dramatic, widespread throughout the head and face, and changes between consultations. The history is often vague, with other complaints such as 'mucus moving' in the sinuses. Some have undergone previous dental and sinus procedures and have shown little improvement. Importantly, clinical examination and endosopy of the nasal cavity is usually unremarkable. The management of these patients is difficult and demanding; acknowledgement of their symptoms, an explanation and a non-confrontational approach often helps.

Conclusion

The majority of patients suffering from chronic infective rhinosinusitis do not complain of facial pain. Most patients with chronic infective rhinosinusitis confirmed at nasal endoscopy complain of other associated nasal symptoms. Patients usually respond to medical treatment directed at the paranasal sinuses; those who do not, respond to surgery. It is important to exclude immunosupressive and ciliary disorders, as surgery in these patients is unlikely to help. Care must be taken when interpreting the history, examination findings and investigations in patients with facial pain, as a large proportion will be suffering from a neurological cause. Patients with pain unrelated to sinus pathology report few nasal symptoms, and clinical examination is usually unremarkable. Chronic bacterial rhinosinusitis is not synonymous with facial pain.

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