The Management of Facial Pain

D Loke, K Menon, A Jebreel, K Wu, N Stafford

Citation

D Loke, K Menon, A Jebreel, K Wu, N Stafford. *The Management of Facial Pain*. The Internet Journal of Otorhinolaryngology. 2005 Volume 5 Number 2.

Abstract

Patients with facial pain are commonly referred to otolaryngologists. Unfortunately many are misdiagnosed as rhinosinusitis and as a result are treated inappropriately. Many of these patients do not actually have sinus disease and the pain could be attributed to other causes. The aim of this paper is to highlight this problem and to look at the evidence with regards to establishing a diagnosis for the patient presenting with facial pain.

INTRODUCTION

Although rhinosinusitis is frequently encountered, diagnosis relies on clinical judgment based on a number of, often, vague physical complaints and symptoms. A classification of rhinosinusitis symptoms has been described by The Task Force on Rhinosinusitis established by the American Academy of Otolaryngology- Head and Neck Surgery. The major symptoms are facial pain or pressure, nasal obstruction, congestion, purulent rhinorrhoea and postnasal catarrh. The minor symptoms include headache, halitosis, fatigue, dental pain, and cough and ear pain[1,2] . Key points in the history of sinusitis are exacerbation of symptoms in association with an upper respiratory tract infection, other concurrent rhinological symptoms and an improvement with medical treatment such as antibiotics and nasal decongestants. Symptoms are usually worse in the winter months. The history should also include a full account of the pain including exact location and radiation, quality, frequency and duration. On nasendoscopy , patients with sinogenic facial pain will often have some objective sino-nasal changes. The diagnosis of sinusitis should be questioned if chronic facial pain is the predominant symptom especially if it occurs on a daily basis and is associated with normal nasendoscopy.

Patients with facial pain are commonly referred to the otorhinolaryngologists. Commonly they have been diagnosed as suffering from sinusitis by both their general practitioners and other specialists. Many of these patients do not have sinus disease and the pain can be attributed to other causes.

The aim of this paper is to highlight this problem and to look at the evidence with regards to establishing a diagnosis and planning treatment for the patient presenting with facial pain.

DISCUSSION

Although sinus infection forms one of the differential diagnoses of facial pain, other rhinological causes have been hypothesized in the aetiology of facial pain. Stammberger[3] and Kopp[4] postulated that variations in the anatomy of the nasal cavity result in obstruction and mucous stasis both of which can lead to infection and facial pain. They also stated that mucosal contact points might result in the release of a neurotransmitter peptide called substance P, a recognized neurotransmitter in nociceptive fibres. Other authors have also proposed such concepts to explain how anatomical variants such as a concha bullosa[5] or pneumatized superior turbinate[6] might produce similar symptoms.

Unfortunately there is no scientific explanation or proof by objective means to support these rhinological theories. It is well recognized that sinus disease is often associated with an anatomical variation such as a concha bullosa or a large agger nasi cell but these variants are also seen in healthy individuals. Numerous comparative studies have been undertaken over the last few years. For example, a retrospective study by Calhoun et al comparing 100 computed tomography scans performed for evaluation of sinus disease with 80 for evaluation of orbital pathology [7] reported a higher prevalence of concha bullosa in the group symptomatic for sinus disease compared to the asymptomatic group. However other studies[8,9,10] have found the prevalence of concha bullosae to be the same in both the symptomatic and control groups. Another study[11] also

assessed the anatomical parameters of women's sinuses, airways and ostia and found that despite being smaller than those of men, there was no difference in the prevalence of symptoms between the sexes. Overall, with the current findings, anatomical variations have shown no consistent correlation with the pathogenesis of facial pain.

Currently, CT scanning is the standard imaging technique undertaken for radiological evaluation of the paranasal sinuses. It is also used as a tool to establish the severity of disease and response to medical and surgical treatment. Despite its widespread use, the true accuracy of CT scanning in diagnosing rhinosinusitis is less clear.

Studies analyzing CT scans of asymptomatic patients have shown rates of incidental sinus opacification as high as 40%. This has also been noted in studies performed in the paediatric population[12,13,14,15]. Glasier et al performed a prospective study on 101 CT scans to identify sinus abnormalities. 31% children older than one year with sinus symptoms had demonstrable CT scan abnormalities however 18% of the asymptomatic children also demonstrated CT scan changes[12]. A similar prospective study on 137 patients by Diament et al showed that approximately half the study group of children below the age of 13 years referred for cranial CTs had demonstrable maxillary or ethmoid sinus opacification[13]. These findings were further complemented by a prospective study on 666 patients without clinical evidence of sinus disease where 42.5% scans had demonstrable sinus opacifications. The concern is that if this specialist investigation is over prescribed, the diagnosis of rhinosinusitis will be inappropriately made in many patients with incidental changes who have minimal or no symptoms.

However even when a patient has relevant symptoms and CT scan shows signs of disease, the extent of the mucosal changes do not necessarily correlate with the extent of their symptoms. This was demonstrated by Bhattacharyya et al in a prospective study of 586 patients[16] . Similarly, in another study, Jianetto et al did not find any correlation between preoperative CT scans and the operative findings of endoscopic sinus surgery[17]. A recent prospective study on 51 patients by Shields et al[18] reported no correlation between facial pain and sinus disease severity based on CT scan findings.

It has also been shown by the Royal College of Radiologists Working Party[19] that plain radiographs have no place in the routine management of rhinosinusitis due to the low specificity and sensitivity (70% and 36% respectively) compared to clinical and surgical findings. MRI scans are not requested routinely as they do not show the bony architecture of the paranasal sinuses as well as CT scans. Ultrasound of the sinuses have been used but numerous studies including a randomized controlledtrial have shown sensitivities as low as 40% and specificity of 55%.[20]

Since the introduction of endoscopic sinus surgery, various reports of the treatment's success have been described. In cases of facial pain secondary to sinusitis, a prospective clinical descriptive study of 252 patients, demonstrated that endoscopic sinus surgery has been shown to alleviate facial pain in approximately 75% of cases[21]. These results have led some to advocate s1ch treatment for facial pain even in the absence of any objective evidence of sinus disease[20,22].

In 1994, Cook et al[22] stated that a selected group of patients with a normal CT scan and nasendoscopy, endoscopic sinus surgery can help alleviate the symptoms of facial pain. The patient group were only followed up for one year. They found that 12 out of the 18 patients had a reduction of facial pain but not complete resolution of symptoms. All patients also had comprehensive medical treatment. However, in this study, they did not consider the possibility of non rhinological causes of facial pain and its treatment

In another study, West et al described 101 out of 973 patients who had symptoms of facial pain but no endoscopic or CT evidence of chronic sinus disease. The 101 patients were followed up for a mean period of 2 years and 2 months. At the end of that period, after various treatment strategies, none of these patients were found to have pain attributable to sinus disease[23]. Eighty patients were treated with medical ‘neurological' treatment and achieve complete resolution of symptoms, in 8 patients, their symptoms resolved spontaneously.

There is no diagnostic test to validate facial pain. Placebo effect, cognitive dissonance, spontaneous resolution of disease and an alteration of the inhibitory effect of the supraspinal fibres can influence the results of treatment. It also interesting to note that the effects of the majority of the treatments do not last more than a year[25,26]. Homer et al concluded that in the absence of objective parameters, it is important to take into account the possible effects of cognitive dissonance on apparent symptom improvement. They also stated that cognitive dissonance is an important component of the placebo effect which can be very powerful in surgery and should not be underestimated.

Whilst patients with facial pain are commonly diagnosed as having "sinusitis", this belief can be very misleading for the patients as there are non-sinogenic causes for facial pain. West et al[24] highlights the need for the surgeon to consider the neurological causes of facial pain especially if there is lack of evidence of sinus disease.

OTHER CAUSES OF FACIAL PAIN

NEURALGIAS

TRIGEMINAL NEURALGIA

This is characterized by stabbing pain restricted to one of the 3 main sensory branches of the trigeminal nerve. It is more common in women in the 5th decade of life. The third division of the nerve is most commonly affected. There is no sensory deficit in trigeminal neuralgia. The stabbing pain occurs and is only momentary in duration. It is often being most distressing for the patient. Pressure on trigger points such as the lip, nasolabial fold and alar base may reproduce the pain.

A MRI should be performed to rule out an intracranial pathology. The standard drug of choice is carbamazepine but gabapentin can also have a primary role in the management of this condition[28,41,42,43]. Invasive intervention for management of trigeminal neuralgia include microvascular decompression, neurectomies, radiofrequency thermal ablation and radiosurgery[42]. Evidence for employing a particular surgical technique is lacking as randomised trials have not been performed[41,42].

VASCULAR

MIGRAINE

This characteristically comprises visual symptoms, nausea and headache. The aura preceding the onset of headache may include an unusual taste, aroma or visual disturbance. The headache is usually of a severe throbbing type associated with nausea and/or photophobia and may be predisposed by stress, certain foods e.g. dairy products, perfumes and menstruation. The management of migraine begins with lifestyle modifications like avoidance of predisposing factors if they can be identified. The medical management of migraine ranges from non-steroidal anti-inflammatory drugs to serotonin agonists. Several randomized controlled trials have been performed in an attempt to ascertain the best modality of treatment for migraine however there still remains differences in opinion among authors. Non-steroidal antiinflammatories are a reasonable choice for mild attacks and some patients get sufficient pain relief from NSAIDS alone. The second most commonly used group of drugs are the serotonin agonists. Interestingly in a randomized study of 112 patients by Di Monda et al it was reported that treatment of an acute attack of migraine with a combination of indomethacin, prochlorperazine and caffeine is significantly more effective than sumatriptan (serotonin agonist) alone[29]. However the triptans are commonly used in adult as well as the paediatric patients. A review article (medline 1966-2002 and Pubmed 1991-2002) by Major et al on the effectiveness of triptans for paediatric migraine revealed that intranasal sumatriptan is safe and effective in the treatment of migraine unresponsive to other interventions. Winner et al performed a multicentre randomized control double blinded trial on the efficacy of sumatriptan on migraine and found that the drug was effective in treating migraine compared to the placebo group[30]. Similar results were published by Nett et al in a randomized control study on efficacy of sumatriptan in premenstrual migraine[31]. Other derivatives of triptans have also been used with success orally as well as intranasal[32]. Schulman et al performed a randomized control trial on triptan non-responsive migraineurs and found that a combination of metoclopramide and sumatriptan provided effective painrelief in this particular group of patients[33]. Although triptans provide effective pain relief it should be used with caution in patients with ischaemic heart disease due to the vasoconstriction effect. Prophylactic treatment of migraine includes beta blockers, calcium channel blockers, serotonin antagonist, nonsteroidal anti-inflammatory drugs and antiepileptic drugs[34,35,36].

CLUSTER HEADACHE

This is a form of migraine which presents with a unilateral frontal or periorbital headache and may wake patients from sleep. Other features include nasal congestion, rhinorrhoea and excessive lacrimation. These symptoms might result in an incorrect diagnosis of sinusitis. Treatment is similar to migraine and triptans have been found to be effective in the management of cluster headache[37,38] . Other drugs that have been used include verapamil and civamide. Saper et al performed a multicentre double blinded randomized vehicle controlled study on the efficacy of intranasal civamide in the treatment of episodic cluster headache and reported that the drug at a dose of 50 micrograms is effective in the prevention of episodic attacks.

CHRONIC PAROXYSMAL HEMICRANIA

This is an uncommon condition which usually affects women. The presentation is similar to a cluster headache with the pain lasting for between minutes and hours and can

occur several times a day. Treatment is with indomethacin[39].

MAXILLOFACIAL

TEMPOROMANDIBULAR JOINT DISORDERS (TMD)

This is a collective term to describe a group of conditions involving the temporomandibular joint(TMJ), masticatory muscles and associated structures. Pain is usually localized to the joint but may spread over the periauricular area extending to the temporoparietal and cervical regions. Chewing usually exacerbates the pain and clicking of the jaw may occur. Gramling et al[36] showed evidence of aberrant muscular activity in the masticatory system in patients with chronic temporomandibular disorders. Treatment of TMD is with oral muscle relaxants and orthotic appliances. Amitriptyline is also used in chronic TMJ pain[40]. Trigger point injections in the masticatory muscles have long been used as an effective short term therapy for many patients[41]. In another study, botolinum toxin-A has also shown to be effective[42,43]. In a randomized blinded placebo controlled study Von Lindern et al reported a 90% improvement in pain following type A botulinum toxin injection for facial pain secondary to masticatory hyperactivity[42].

ATYPICAL AND TENSION TYPE FACIAL PAIN (‘MID FACIAL SEGMENT PAIN')

In these patients pain is considered to be a symptom of an underlying psychological or psychiatric disease. In common with all pain syndromes, psychological factors are clearly relevant to many patients with facial pain, and in some patients with ‘non-organic' facial pain these are of great significance.

However, many patients have a clinical syndrome with similarities to tension type headache and in these patients, psychological problems are less apparent. They can frequently benefit from appropriate medical treatment. Many believe that these patients with tension type facial pain represent a group distinct from the true ‘atypical facial pain' where psychological factors play a predominant role. This latter group may be considered as the facial version of tension-type headache[43].

Overall this group of patients probably represent the commonest cause of facial pain. Unfortunately, these patients are frequently misdiagnosed as having sinusitis. Previous sinus surgery may have provided temporary relief, reinforcing the diagnosis. There is typically a pressure headache that can last for a few hours and usually occurs daily. It can be frontal, periorbital or maxillary. Simple analgesia is often effective in the initial period but becomes less as time passes. Treatment is usually with amitriptyline[45].

SINONASAL TUMOURS

These are rare and thorough nasendoscopy and on coronal plane CT scanning will almost always demonstrate lesion.

CONCLUSION

The diagnosis and management of facial pain continues to pose a great challenge to clinicians even though it is a relative common problem. Unfortunately, the clinician frequently has to rely on the patient's subjective symptoms, which can be very vague. There are often only a few objective criteria. The effective management of facial pain is based on a thorough history and examination including a nasendoscopy. It is important that facial pain is not misdiagnosed as sinus disease, with patients subjected to unnecessary sinus surgery which often does nothing more than reinforce their conviction that there is a serious disease responsible for their symptoms. CT scanning has a role when endoscopic sinus surgery is planned and in ruling out the possibility of a tumour but has a limited role in the diagnosis of sinusitis. In some cases where pain has features of several conditions, medical treatment of facial pain is in reality a trial and error process. However it is important to resist the temptation to automatically resort to surgery after failure of medical treatment.

CORRESPONDENCE TO

Mr Kenneth Wu MRCS 207 Pinsent Block Millsands Sheffield S3 8NG United Kingdom Tel:00-44-1709-304-560 (ENT secretary) Fax:00-44-114-271-1985 Email: drkenwu@hotmail.com

References

1. Lanza DC, Kennedy DW. Adult rhinosinusitis defined. Otolaryngol Head and Neck Surg 1997;117(part 2):S1-S7
2. Hadley JA, Schaefer SD. Clinical evaluation of rhinosinusitis: history and physical evaluation. Otolaryngol Head and Neck Surg 1997;1179part2):S8-S11
3. Stammberger H. (1991) Secretions transport. In Functional Endoscopic Sinus Surgery pp. 17-46.
4. Kopp W, Stammberger H, Fotter R (1998). Special radiologic image of the paranasal sinuses. Eur. J. Radiol.;8.152-156
5. Blaugrund SM. Nasal septum and concha bullosa. Otolaryngol Clin North Am (1989);22:291-306.
6. Clerico DM. Pneumatized superior turbinate as a cause of referred migraine headache. Laryngoscope (1996);106:874-879
7. Calhoun KH, Waggenspack GA, Simpson CB (1991). CT evaluation of the paranasal sinuses in symptomatic and asymptomatic populations. Otolaryngol Head and Neck

Surgery.104,480-483.
8. Bolger WE, Butzin CA,Parsons DS. (1991). Paranasal sinus bony variations and mucosal abnormalities: CT analysis for endoscopic sinus surgery. Laryngoscope 101,56-64
9. Jones NS, Strobl A, Holland I (1997). CT findings in100 patients with rhinosinusitis and 100 controls. Clin. Otolaryngol.;22,47-51.
10. Kayalioglu G, Oyar O, Govsa F (2000). Nasal cavity and paranasal sinus bone variation: a computed tomography study. Rhinol. 13,23-26
11. Lang J. (1989) Clinical anatomy of the nose, nasal cavity and paranasal sinuses. pp.1-144
12. Glasier CM, Ascher DP, Williams KD. Incidental paranasal sinus abnormalities on CT of children: clinical correlation. AJNR Am J Neuroradiol (1986); 7:861-864.
13. Diament MJ, Senac MO, Gilsanz V. Prevalence of incidental paranasal sinuses opacification in pediatric patients: A CT study. J Comput Assist Tomogr (1987).;3:426-431.
14. Havas TE, Motbey JA, Gullane PJ. Prevalence of incidental abnormalities on computed tomography scans of the paranasal sinuses. Arch Otolaryngol Head and Neck Surg. (1998);114:856-859.
15. Flinn J, Chapman NE, Wightman AJ. A prospective analysis of incidental paranasal sinus abnormalities on CT head scans. Clin. Otolaryngol 1994;19:287-289.
16. Bhattachryya T, Piccirillo J, Whippold FJ. (1997). Relationship between patient- based descriptions of sinusitis and paranasal sinus CT findings. Arch. Otolaryngol Head and Neck Surg 123;1189-1192.
17. Jianetto DF, Pratt MF. (1995) Correlation between preoperative computed tomography scans and operative findings in functional endoscopic sinus surgery. Laryngoscope 105:924-927.
18. Shields G, Seikaly H, Le Bouef M, Guinto F, Pincus T, Calhoun K. (2003) Correlation between facial pain or headache and CT in rhinosinusitis in Canadian and US subjects. Laryngoscope 113, 943-945
19. The Royal College of Radiologist Working Party (1995). Making the best use of the Department of Clinical Radiology: Guidelines for doctors, #rd Edition,pp1-96. The Royal College of Radiologist, London. ISBN: 1 872599044
20. Spapiro GG, Furukawa CT, Pierson WE, Gilbertson E, Bierman CW (1986). Blinded comparison of maxillary sinus radiography and ultrasound for diagnosis of sinusitis. J Allergy Clin Immunol 77:59-64
21. Acquadro MA, Salman SD, Joseph MD (1997) Analysis of pain and endoscopic sinus surgery for sinusitis. Ann. Otol.Rhinol. Laryngol.106, 305-309
22. Cook PR, Nishioka G, Davis WE et al(1994) Functional endoscopic sinus surgery in patients with normal computed tomography scans. Otolaryngol. Head and Neck Surg 110, 505-509
23. Boonchoo R (1997) Functional endoscopic sinus surgery in patients with sinugenic pain. J. Med. Assoc. Thai. 80,521-526
24. West B, Jones NS. (2001). Endoscope negative, CT negative facial pain in a nasal clinic. Laryngoscope 111:581-586.
25. Seesle BJ (2000) Acute and chronic craniofacial pain: brainstem mechanisms of nociceptive transmission and neuroplasticity, and their clinical correlates. Crit. Rev. oral Biol. Med. 11:57-91
26. Homer J, Jones NS, Sheard C (2000) Cognitive dissonance, the placebo effect and the evaluation of surgical results. Clin Otolaryngol. 25:195-199
27. The Headache Classification Committee of the International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgia and facial pain. (1998). Cephalgia, 8:1-96
28. Rockliff BW, davis EH. Controlled sequential trials of carbamezepine in trigeminal neuralgia. J Neurol Neurosurg Psychiatry 1996;29:265-7
29. Grazioli I, Monda D, Bianco D (2003) Efficacy of a fixed combination of indomethacin, prochlorperazine and caffeine Headache: The Journal of Head and Neck Pain 43;8:835
30. Winner P, Mannix LK, Putnam DG et al (2003) Pain free results with sumatriptan taken at the first sign of migraine pain: 2 randomized, double-blind, placebo-controlled studies. Mayo Clin Proc.78:1214-22
31. Nett R, Landy S, Shackelford S et al (2003) Pain free efficacy after treatment with sumatriptan in the mild pain phase of menstrually associated migraine. Obstet Gynecol. 102:835-42
32. Syrett N, Abu-Shakra S, Yates R (2003). Zolmitriptan nasal spray: advances in migraine treatment. Neurology. 28:S27-30
33. Schulman EA, Dermott KF (2003). Sumatriptan plus metoclopramide in triptan-nonresponsive migraineurs. Headache. 43:729-33
34. Anderson KE, Vinge E. Beta blockers and calcium channel blockers in the prophylaxis treatment of migraine. Drugs. 1990;39:355-373.
35. Antonaci F, Costa A, Girmai S, Sances G, Sjaastad O, Nappi G. Indomethacin (The INDOTEST) in cluster headache. Cephalgia.2003;23:193-196.
36. Gramling SE, Grayson RL, Sullivan TN, Schwartz S. Schedule-induced masseter EMG in facial pain subjects vs no pain controls. Physiol Behav. 1997;61:301-309.
37. Van Vliet JA, Bahra A, Martin V, Ramadan N, SAurora SK, Matthew NT, Ferrari MD, Goadsby PJ. Sumatriptan in cluster headache: a randomized placebo-controlled double blinded study. Neurology.2003;60:630-633.
38. Bahra A, Gawel MJ, Hardebo JE (2000). Oral zolmitriptan is effective in the acute treatment of cluster headache. Neurology. 54:1832-9
39. Pareja J, Sjaastad O. Chronic paroxysmal hemicrania and hemicrania continua. Interval between indomethacin administration and response. Headache. 1996;36:20-23.
40. Rizzatti-Barbosa CM, Nogueira MT, De Andrade ED et al (2003). Clinical evaluation of amitriptyline for the control of chronic pain caused by temporomandibular joint disorders. Cranio. 3:221-5
41. Sessle BJ. Masticatory muscle disorders: basic science perspective. Progress in Pain Research and Management. Vol 4. Temporomandibular Disorders and Related pain conditions. Seattle: International Association for the study of pain;1995:47-61.
42. Von Lindern JJ, Niederhagen B, Berge S et al (2003). Type A botulinum toxin in the treatment of chronic facial pain associated with masticatory hyperactivity. J Oral Maxillofac Surg. 7:774-8
43. Freund BJ, Schwartz M. Relief of tension headache symptoms in subjects with temporomandibular disorders treated with Botulinum Toxin-A.Headache.2002;42:1033-1037.
44. Jensen R, Olsen J (2000) Tension type headache: an update on mechanisms and treatment. Current Opinion in Neurology 200013:285-289
45. Jones N (2001). Classification and Diagnosis of facial pain. Hospital Medicine. 62:10:598-605

Author Information

David Loke, MRCS

Kavita Menon, MRCS
Department of Otorhinolaryngology- Head and Neck Surgery, Hull Royal Infirmary

Ala Jebreel, MRCS
Department of Otorhinolaryngology- Head and Neck Surgery, Hull Royal Infirmary

Kenneth Wu, MRCS
Department of Otorhinolaryngology- Head and Neck Surgery, Hull Royal Infirmary

Nicholas Stafford, FRCS
Department of Otorhinolaryngology- Head and Neck Surgery, Hull Royal Infirmary