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Causes and Management of Facial Pain Due to Sinonasal Disease

Dr. Ahmad Yasir Albaaj[1], Dr. Saad Salih Abdulqader[2], Dr. Nidaa Mohammed Taher Alkhayat[3]

[1]M.B.Ch.B., HD. Otorhinolaryngology, ENT Unit Surgical Department, Baghdad Health Office/Al-Rasafa/Al-Sader Hospital

[2]M.B.Ch.B., HD. Otorhinolaryngology, ENT Unit Surgical Department. Baghdad Health Office/Al-Rasafa/Al-Nu'man Teaching Hospital

[3]M.B.Ch.B., HD. Histopathology, Laboratory Department, Baghdad Health Office/Al-Rasafa/Al-Nu'man Teaching Hospital

Abstract: ***The patient with facial pain presents a diagnostic challenge. Difficulties arise because of the frequency of referred pain and the overlap in symptoms between different conditions. 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. Some of these patients do not have sinus disease and pain can be attributed to other causes. The aim of the study is to define the incidence of facial pain due to sinonasal diseases in Iraqi patients and the role of otolaryngologist in the management. This prospective study was conducted at the department of otolaryngology-hospital of surgical specialties-Medical city in Baghdad during the period from April 2008 to December 2008, including 140 adult patients complaing of facial pain. Evaluation of facial pain related to sinonasal diseases was done at the time of presentation and 3 months after receiving treatment. Among 140 patients suffering from facial pain presented to otolaryngology clinic, 67.86% were due to sinonasal diseases and 32.14% of them were not related to ENT diseases. Patients age ranged from 17 years to 67 years. Acute sinusitis represents the commonest cause of facial pain due to sinonasal diseases (26.31%). Only 40 patients from the total of 51 that treated surgically can be followed up (78.43%), and showed that 30 patients from 40 (75%) improved and got benefits from surgery. The best result obtained from FESS, removal of antrocoanal polyps and reduction of fractured nose which was 100% for each one, while 82.35% of the patients treated by septoplasty improved and got free from facial pain following the surgery. In conclusion the majority of patients with facial pain were related to sinonasal a disease of which acute sinusitis was the commonest. Carcinomas (maxillary or nasopharyngeal) and other serious illness may presents with facial pain, so good assessment of suspicious patients is needed.***

Keywords: Fasial pain, sinonasal diseases, sinusitis

1. Introduction

The patient with facial pain represents a diagnostic challenge. Difficulties arise because of the frequency of referred pain and the overlap in symptoms between different conditions [1].

Painful stimuli affecting facial structures are mostly transmitted via afferents in the trigeminal nerve to the spinal tract in the brain stem. Pain afferents from the VIIth, IXth and Xth cranial nerves also relay in the spinal tract. The majority of these fibers is unmyelinated and therefore produces a poorly localized dull ache, rather than the sharp, well-defined pain produced by the myelinated fibers which supply the skin of the face. Referred pain, on the other hand, represents incorrect central interpretation, probably due to stimulation of the same group of cells in the central posterior nucleus of thalamus, although a more peripheral interaction cannot be excluded [1].

The International Association for the Study of Pain defines pain as "unpleasant sensory and emotional experience associated with either actual or potential tissue damage". Acute pain is a normal and generally self-limited response to injury, including tissue degeneration, which can be considered an aging injury. Pain is defined as "chronic" when it has persisted for at least 3 months. Because of its emotional component, pain is often associated with psychological comorbidities, including depression. Chronic pain serves on useful function and leads to great disability. It is important to search for the underlying biologic aspect of pain and treat them whenever possible [2].

1.1 The Facial Nerve

The facial nerve (CN VII) supplies the superficial muscle of the neck (platysma), the muscles of facial expression, the auricular muscles, the scalp muscles and certain other muscles derived from the mesoderm in the embryonic second pharyngeal or branchial arch [3].

The facial nerve is the sole motor supply to the muscles of facial expression and is sensory to the taste buds in the anterior two-thirds of the tongue. It also conveys general sensation from a small area around the external acoustic meatus and is secretomotor to the submandibular, sublingual and intralingual salivary glands [3].

1.2 Facial pain causes

1.2.1 Rhinological pain

The lining of the sinuses is relatively pain insensitive, and that the bulk of the severe pain in sinus disease is due to the congestion of the nasal mucosa and the turbinates. As such involvement produces symptoms of nasal congestion and discharge the diagnosis should be obvious [4]. Multiple neuropeptides have been found in the nasal mucosa that functions as neurotransmitters. One of these is Substance P (SP). Receptors within the sinonasal mucosa are stimulated by chemical and caloric irritants, as well as by mechanical irritants such as pressure. These receptors are one

component of local reflexes that when stimulated produce vasodilatation, plasma extravasation (neurogenic edema) and hypersecretion. Pressure exerted on the nasal mucosa by polyps or mucosal swelling can be enough to trigger as SP-mediated pain sensation. Due to the axonal reflex, relatively small lesions may lead to a vicious cycle and significant symptoms. Certain anatomic conditions predispose to the process [5], those anatomic variations cause mucosal contact points that might result in release of substance P [6, 7].

Infection or blockage of paranasal sinuses is accompanied by pain over the affected maxillary or frontal sinuses. Usually it is associated with tenderness of the skin in the same distribution. Pain from the ethmoid and sphenoid sinuses is localized deep in the midline behind the root of the nose or occasionally at the vertex (especially in disease of the sphenoid sinus) or other part of the cranium [8].

The mechanism involves changes in pressure and irritation of pain sensitive sinus walls. Sinus pain has two remarkable properties:

1) When throbbing, it may be abolished by compressing the carotid artery on the same side
2) It recurs and subsides periodically, depending on the drainage from the sinus. With frontal and ethmoidal sinusitis, the pain tends to be worse on awakening and gradually subsides when the patient is upright; the opposite pertain with maxillary and sphenoidal sinusitis [8].

These relationships are believed to disclose their mechanism; pain is ascribed to filling of the sinus and its relief to their emptying, induced by the dependent position of the ostia. Stooping intensifies the pain by causing changes in pressure, as does blowing the nose if the ostium of the infected sinus is patent; during air flights, both earache and sinus headache tend to occur on descent, when the relative pressure in the blocked viscus falls [8]. The pain may persist after all purulent secretions have disappeared, probably because of blockage of the orifice by boggy membranes and absorption of the air from the blocked sinus (vacuum sinus headaches) [8]. The pattern of referred sinus pain has been well documented [9].

1.2.2 Rhinological diseases that causes headache are:

a) Acute sinusitis often causes pain which is exacerbated by bending down. It is common for the maxillary teeth to ache and while the maxilla may be slightly tender to palpation, marked swelling of the cheek is rare and suggests dental infection. Symptoms of pain high on the calvarium or over the temples is less readily recognized as being due to sinus disease but can arise from the sphenoid or posterior ethmoidal cells. Frontal pain can be caused by obstruction of the frontonasal recess, and in particular by disease in the very ethmoidal air cells called the agger nasi cells [1].

b) Chronic sinusitis is often painless, causing postnasal catarrh or nasal obstruction except during acute episodes. Symptoms of a dull ache around the medial canthus of the eye, the lower part of the forehead, or under the nasal bridge are often related to sinus disease [1]. Blockage symptom under the nasal bones may present in the absence of airflow obstruction and this may be due to mucosal disease in the ethmoid sinuses with obstruction of the ostiomeatal complex and subsequent under-aeration of the sinuses. Such symptoms are often exacerbated by upper respiratory tract infections, although the primary pathology is just as likely to be allergic as infective [1].

c) Allergic rhinitis mucosal swelling can contribute to sinus obstruction, pressure symptoms and mucus retention. A history of asthma, eczema or hay-fever in a first-degree relative increases the likelihood of in allergic element in mucosal disease. Itchy eyes or an improvement in symptoms with topical steroids or antihistamines also support an allergic element [1].

d) Anatomical variations can contribute to obstruction and inadequate ventilation and drainage of the sinuses, e.g. a deviated septum, paradoxical middle turbinate, or a concha bullosa [(1)]. It is possible that pressure exerted by septal deviation on adjacent sensory nerves can produce pain, the resultant condition has been known as 'the anterior ethmoidal nerve syndrome'[10].

The same anatomic variations that predispose to recurrent sinusitis also predispose to headaches [11]:

a) Septal spurs and deviations.
b) Agger nasi cells
c) Variations of the uncinate process.
d) Concha bullosa.
e) Paradoxical middle turbinates.
f) Variations of the ethmoid bulla.
g) Pneumatized superior turbinate [12].

e) Maxillary dental infections can initiate and perpetuate maxillary sinusitis: therefore premolar and molar teeth need inspection [1].

f) Nasal fracture occasionally followed by pain or paraesthesiae which may persist over the nasal bridge. The cause of this is unclear, it may be due to a neuroma in the scar tissue, but again it seem to be influenced by the degree of distress the patient continues to feel about the insult he has received. Frequently patients who are dissatisfied with the appearance of their nose are reluctant to present this as their primary problem [13].

g) Nasal polyps although not frequent, pain does occur and is usually over the bridge of the nose, the forehead and cheeks. It is worse when the nose is congested or when the postnasal drip changes in colour and the sinuses are infected secondarily [14].

h) Carcinoma of the maxilla is rare. Patients unfortunately often present late when the disease has spread beyond the confines of the sinus. Unilateral bloody purulent nasal discharge is the most frequent presentation. Less common symptoms are infraorbital paraesthesiae, loose teeth or ill-fitting dentures, proptosis, deformity of the cheek, nasal obstruction or epistaxis. Pain is a late feature [1].

i) Nasopharyngeal carcinoma is also rare, but presents most commonly in young adults from the Far East. It often

presents with cervical lymphadenopathy and middle ear effusions; however, its spread can involve the Vth and VIth cranial nerves, causing facial pain or lateral rectus palsy. It can also spread posteriorly to involve the IXth-XIIth cranial nerves [1]. Malignant disease in the skull base, often due to direct extension from a carcinoma of the nasopharynx, tends to involve the fifth nerve. Pain in the second and third division, or a patch of numbness on the face should be regarded as due to nasopharyngeal carcinoma until proved otherwise [4]. The tumor may cause Trotter's triad unilateral middle ear effusion, elevation and immobility of the ipsilateral soft palate, and pain in the ear, jaw or tongue [1].

If nasopharyngeal tumor extends intracranialy, it may cause:

- Godtfredsen's syndrome ophthalmoplegia, pain in the distribution of the trigeminal nerve and tongue paralysis.
- Ptreygopalatine fossa syndrome this is caused by malignant infiltration in this area producing maxillary dental pain, infraorbital and palatal anesthesia, pterygoid muscle paralysis and blindness.
- Foix's syndrome in this syndrome there is also ophthalmoplegia and trigeminal pain but without any tongue signs. It can be caused by an aneurysm abutting, a tumor invading or a thrombosis of the cavernous sinus.
- Tolosa Hunt syndrome (recurrent painful ophthalmoplegia) this occurs equally in both sexes at any age. It presents with gnawing unilateral orbital pain with relapsing and remitting paralysis of the IIIrd, IVth and VIth cranial nerves. Occasionally there is paraesthesiae of the forehead. It is caused by a lesion in the region of the cavernous sinus or the superior orbital fissure [1].

j) Sinonasal surgery, facial pain may occur following sinonasal surgery whether in the form of ESS, Caldwell-Luc procedure, Antrostomy or septorhinoplasty [15].

k) Acute infections of the external nose: These may include furunculosis, vestibulitis, cellulitis and herpes-zoster infection [16].

1.3 Non-rhinological causes

a) Masticatory pain: Pain in and around the TMJ on eating and function is usually due to MFPDS or true TMJ disease. While unerupted third molars are often blamed for TMJ pain they are rarely painful especially if unerupted, covered by bone and not associated with pericoronitis. Because it is so common in the population there is a danger of over diagnosing TMJ pain and missing simple caries and periodontal disease and not so simple squamous cell carcinoma.

b) Myofacial pain dysfunction syndrome: This causes a widespread, poorly defined aching in the neck, jaw or ear. It is five times more common in women and worse when the patient is tired or stressed. Tender points may be found in the sternomastoid or trapezius muscles and initiating factors include malocclusion or poor deltopectoral posture. This syndrome overlaps to a large degree with tempromandibular joint dysfunction [1].

c) TMJ pathology - arthritis - internal derangement fracture etc. Tempromandibular joint dysfunction is the most commonly unilateral (90%) and usually occurs in young adults with history of bruxism, clenching, trauma, recent dental work, anxiety, enthusiastic kissing, or cradling the telephone between the jaw and the shoulder. Another contributing factor is poor occlusion as occurs in cross bite, or in a partially edentulous patient without an appropriate denture, or in someone with completely edentulous mouths whose dentures are very worn or have been made with an inadequate vertical height resulting in overclosure. Pain is caused by pterygoid spasm and is described as a deep dull ache which may masquerade as toothache or earache. There is often a superimposed sharper component which may radiate down the neck, or over the side of the face or temple. It is often necessary to ask whether chewing exacerbates the symptoms. Spasm may be initiated by a reflex mechanism to avoid an undesirable pattern of malocclusion. Anxiety lowers the threshold for this mechanism, and it often occurs in people under stress. Clicking of the tempromandibular joint is an unreliable sign, whereas pain on palpation of the insertion of the lateral pterygoid is a better indicator. This can be demonstrated with the gloved little finger where the lateral pterygoid muscle can be palpated at the most posterior end of the upper buccal sulcus. Trismus and deviation of the jaw from the midline on opening, as well as evidence of malocclusion or a high shiny spot on filling, should be sought. Radiographs are usually of little help in making the diagnosis, but where in a suspicion of an arthropathy they may show degenerative changes in rheumatoid arthritis or gout. Most patients respond when aggravating factors are corrected and if advice to rest the joint is followed, e.g. stifle yawns, avoid prolonged chewing. It is often helpful to reassure patients that they do not have arthritis of the joint- a common anxiety [1].

Costen's syndrome, a dull pain in the area of the joint, with tinnitus and an intermittent or continuous impairment of hearing, is not a distinct entity [1].

d) Migraine: Migraine presents in a variety of ways, affecting 8-10% of adults. It is a term which is often wrongly used by the patients: the diagnosis needs confirmation by precise questioning. Migraine classically presents with prodromal symptoms including nausea, paraesthesiae and visual disturbances such as fortification, scintillating scotoma, blurred vision and flickering fields. A prodromal state is not essential in order to make the diagnosis [1]. Visual disturbances are helpful in differentiating migraine from sinonasal headache [17]. There is often a family history of migraine. It is said to be due to a primary vasoconstriction of cerebral vessels followed by vasodilatation. It can be induced by stress, diet, premenstrual state and barometric changes [1].

Hemifacial pain may occur in the frontal, temporal or parietal regions and starts on the same side in 90% of attacks. Symptomatic relief is often best obtained by soluble aspirin, paracetamol or codeine, taken as early as possible, with rectal or buccal prochlorperazine if nausea is a problem. Ergotamine help in patients who fail to respond to analgesics but it can make the nausea worse. Pizotifen often gives good prophylaxis [1].

e) Tension headache
This typically described as a feeling of tightness, pressure or constriction which varies in intensity, frequency and duration, and may be at the vertex or forehead, eyes or temple, and often has a suboccipital component. It often lasts many hours, is only partly relieved by analgesics and is associated with anxiety, depression or agitated depression. The headaches can last for several days. A sympathetic explanation of the relationship of stress to physical symptoms is sometimes helpful. Low doses of amitriptyline help a proportion of these patients [1].

Midfacial segment pain
Many patients previously labeled as having atypical facial pain appear to have a specific clinical syndrome that is very similar to tension-type headache except that their symmetrical facial pain involves the midface and retro-orbital region [20]. The quality of the pain is identical to those in tension-type headache including the hyperaesthesia of the skin and soft tissue in the area affected. Midfacial segment pain may be considered as the facial version of tension-type headache and the two conditions frequently overlap [18]. These patients are often misdiagnosed as having sinogenic pain and may have undergone previous sinus surgery. Patients with midfacial pain are generally functioning well in their everyday lives. There is rarely a history of depression. Typicaly, there is a bilateral band-like ache or pressure that can be frontal, periorbital or maxillary (fig.2). The pain lasts for many hours and on daily basis. It is often present on waking, although it does not interfere with the patient getting to sleep. The pain can reduce during periods away from work such as weekends or while on holiday. Examination often relieves a degree of tenderness or hyperaesthesia over the skin and soft tissues of the affected area. Nasendoscopy shows normal mucosa, and helps to reassure the patients they do not have sinusitis.

Patients & Methods
This prospective study was conducted at the department of otolaryngology, Hospital of surgical Specialities in Baghdad during the period from April 2008 to December 2008. During this period 140 patient with facial pain were seen in ENT department. Evaluation of the pain due to sinonasal diseases was done at the time of presentation and 3 months after surgical treatment. Assessment of the patient done was as following:

1) **History**, regarding the site, nature, duration, intensity, frequency, associated symptoms, relieving and aggravating factors.
2) **Other ENT symptoms**, e.g. hearing loss, ear discharge, dysphagia,..etc.
3) **Past medical & past surgical history,** history of trauma, medication, family & social history (smoking and alcohol ingestion).
4) **Thorough clinical examination** regarding the head and neck, cranial nerves and fiber optic nasopharyngeal examination.
5) **Investigations**, including:
   - Hematological tests e.g. complete blood picture, ESR, and blood sugar.
   - Radiological tests included:
     Plain X-ray of paranasal sinuses and nasopharynx.
     Plain X-ray of TMJ.
     CT scan
   - Histopathological examination in the cases of a mass (tumour)
6) **Treatment**
   - Medical: for medical cases, mild cases, those unfit for anesthesia & those who refuse surgery.
   - Surgical: for severe cases (e.g. moderate septal deviation & impacted septum) and for those with failed medical treatment.

Response: after 3 months (and frequently during this period) with applying the same questionnaire.

2. Results

Among 140 patients suffered from facial pain, 95 patients were diagnosed as having a sinonasal disease (67.86%) and 45 cases (32.14%) were not related (as diagnosed by the consultation of the specialists in the related speciality).This is illustrated in table (1) and figure (1)

Table 1: Distribution of 140 patients according to diagnosis

Diagnosis	Number	%
Related to sinonasal diseases	95	67.86
Unrelated to sinonasal diseases	45	32.14
Total	140	100

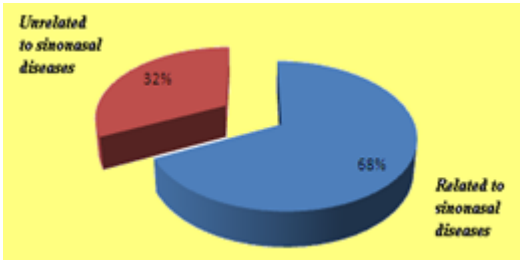

Figure 1: Distribution of 140 patients according to diagnosis

The patients that had facial pain related to sinonasal diseases are evaluated in details as shown below. The most common age groups were between 21 and 30 years (37.89%), as shown in table (2).

Table 2: Distribution of 95 patients according to age groups

Age groups(years)	Number	%
<21	16	16.84
21-30	36	37.89
31-40	26	27.36
41-50	12	12.63
51-60	3	3.16
>60	2	2.11
Total	95	100

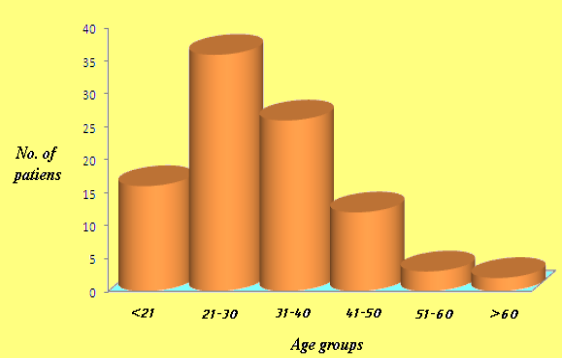

Figure 2: Distribution of 95 patients according to age groups

Females (53.69%) were more than males (46.31%) as shown in table (3).

Table 3: Distribution of 95 patients according to gender

Gender	Number	%
Male	44	46.31
Female	51	53.69
Total	95	100

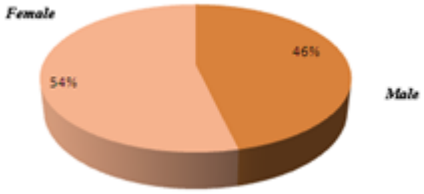

Figure 3: Distribution of 95 patients according to gender

The frequency of associated symptoms with facial pain is illustrated in table (4):

Table 4: Frequency of associated symptoms

Symptom	No. of patients	%
Nasal obstruction	80	84.21
Nasal discharge	68	71.57
Postnasal discharge	59	62.11
Sore throat	35	36.84
Fever	21	22.11
Fullness of ear	17	17.89
Ear pain	15	15.79
Snoring	15	15.79
Epistaxis	13	13.86
Sneezing	11	11.57
Limited mouth opening	7	7.36
Eye pain	7	7.36
Pressure behind eyes	3	3.15
Jaw pain	2	2.11
Parasthesia	2	2.11
Neck mass	2	2.11
Photophobia	1	1.05

All of patients were submitted to endoscopic examination. The majority had Purulent discharge as shown in table (5):

Table 5: Distribution of signs according to endoscopic examination

Endoscopic examination findings	Number	%
Purulent discharge	32	33.68
No finding	22	23.15
Inferior turbinate hypertrophy	18	18.95
Septal deviation	17	17.89
Nasal polyp	10	10.52
Middle turbinate hypertrophy	6	6.31
Necrotic turbinates	6	6.31
spur	5	5.26

The characteristics of pain presented in the study are shown in table (56):

The patients presented with facial pain were mostly associated with nasal obstruction (84.21%), followed by nasal discharge (71.57%) and postnasal discharge (62.11%).

Table 6: Characteristics of pain

	Location	**Number**	**%**
	Maxillary	55	57.89
	Frontal	15	15.78
	Around eyes	12	12.63
	Over nose	6	7.36
	Total	95	100
	Duration	**Number**	**%**
Short (weeks)	<1	17	17.89
	1-3	21	22.11
	>3	15	15.78
Long (years)	1-2	22	23.15
	-4	9	9.47
	-6	11	11.57
	>6	1	1.05
	Total	95	100
	Intensity	**Number**	**%**
	Mild	21	22.11
	Moderate	42	44.21
	Sever	32	33.68
	Total	95	100
	Nature	**Number**	**%**
	Dull	66	69.47
	Throbbing	25	26.31
	Burning	2	2.11
	Band like	2	2.11
	Total	95	100
	Depth	**Number**	**%**
	Deep	92	96.84
	Superficial	3	3.16
	Total	95	100
	Continuity	**Number**	**%**
	Intermittent	88	92.63
	Continuous	7	7.37
	Total	95	100
	Frequency	**Number**	**%**
	Seldom	1	1.05
	Occasional	23	24.21
	Frequent	23	24.21
	Everyday	48	50.53
	Total	95	100
	Progression	**Number**	**%**
	Progressive	5	5.26
	Not progressive	90	94.74
	Total	95	100
	Length of episodes	**Number**	**%**
	Minutes	23	24.21
	Hours	38	40
	Days	34	35.78
	Total	95	100
	Effect on life	**Number**	**%**
	Positive	18	19.94
	Negative	77	81.06
	Total	95	100

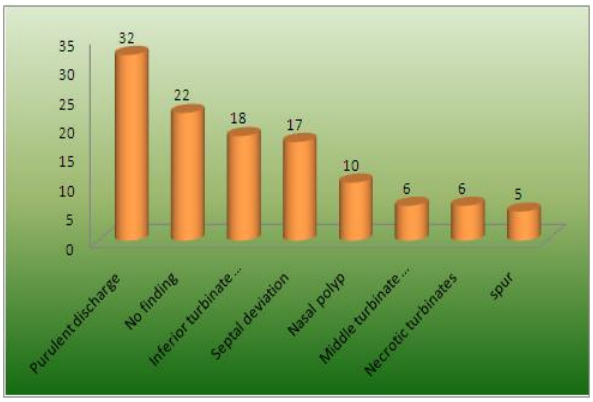

Figure 4: Distribution of signs according to endoscopic examination

Plain sinus X-ray was done for all the patients, the majority of them have shown sinus opacity. This is illustrated in table (7):

Table 7: Distribution of signs of 95 patients according to plain X-ray findings

Finding	No. of patient	%
Sinus opacity	32	33.68
Mucosal thickening	23	24.21
Normal	18	18.94
Opaque nasal cavity+ sinus	15	15.78
Fluid level	5	5.26
Fracture nasal bone	2	2.11
Total	95	100

CT scan of the nose and paranasal sinuses (coronal sections) was done for 53 patients. The commonest finding was homogenous isodese opacity of the maxillary sinus as seen in table (8):

Acute sinusitis represented 26.1% of cases and was the commonest disease among other diagnostic diseases. This is seen in table (11).

Table 8: Distribution of signs of 53 patients according to CT scan findings

Finding	No. of patient	%
Homogenous isodese opacity of the maxillary sinus	12	22.64
Septal deviation	11	20.75
Fluid level in the antrum	10	18.87
Inferior turbinate hypertrophy	8	15.09
Homogenous Isodense opacity of the maxillary sinus & nasal cavity	8	15.09
Middle turbinate pneumatization & hypertrophy	3	5.66
Nasopharyngeal isodense mass	1	1.88
Total	53	100

Table (9): Distribution of 95 patients according to the diagnosis

Diagnosis	No. of patients	%
Acute sinusitis	25	26.31
Chronic sinusitis	19	20
Septal deviation	17	17.89
Allergy	7	7.39
Mucormycosis	6	6.31
Nasal polyp	6	6.31
Antrochoanal polyp	5	5.26
Fractured nasal bone	4	4.21
Concha bullosa	2	2.11
Septal hematoma (or abscess)	2	2.11
Maxillary carcinoma	1	1.05
Nasopharyngeal carcinoma	1	1.05
Total	95	100

Table 10: Distribution of 51 patients according to surgical treatment

Surgical treatment	No. of patients	%
Septoplasty + SMD	17	33.3
Antral washout	7	13.7
Intranasal polypectomy	6	11.7
FESS	6	11.7
Inf. Meatal antrostomy + SMD	6	11.7
Removal of Antrochoanal polyp	5	9.8
Reduction of fractured nose	4	7.8
Total	51	100

Forty four patients (46.31%) were managed medically and the remaining 51 (53.69%) managed surgically.

Table 11: Distribution of 95 patients according to management

Management	No. of patients	%
Medical	44	46.31
Surgical	51	53.69
Total	95	100

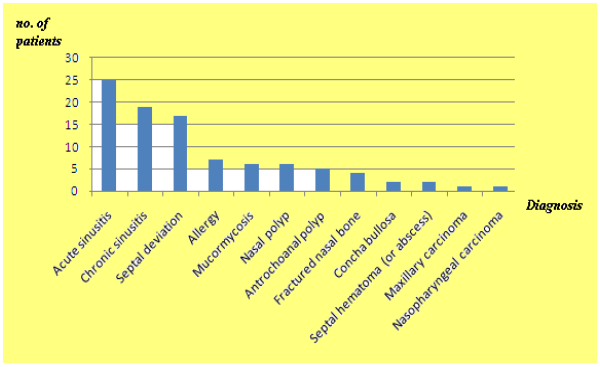

Figure 5: Distribution of 95 patients according to the diagnosis

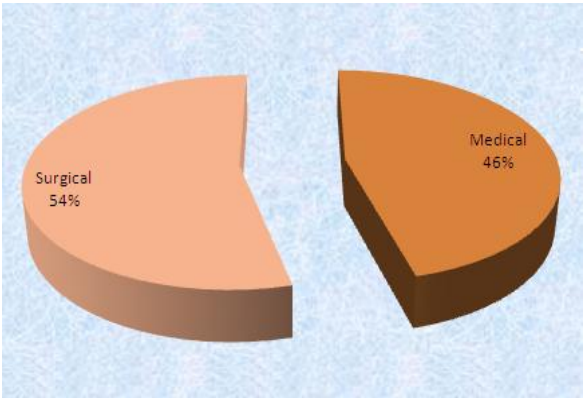

Figure 6: Distribution of 95 patients according to management.

Surgical treatment for ENT related facial pain was most commonly in the form of septoplasty with submucosal diathermy followed by antral washout. This is illustrated in table (13).

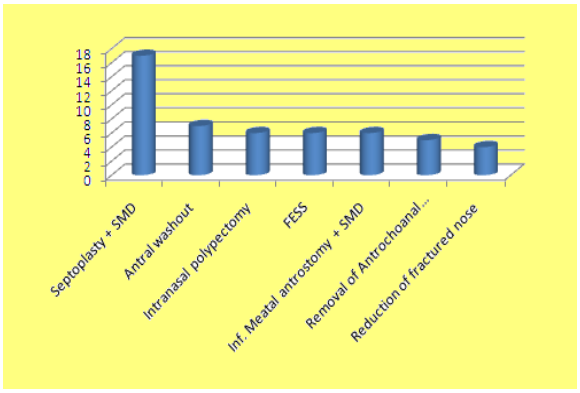

Figure 7: Distribution of 51 patients according to surgical treatment

Evaluation of the pain was done at the time of presentation and three months after the treatment.

Only 40 (78.43%) patients were able to follow up after the surgery, and the result showed that 30 patients from 40 improved and got benefits from surgery (75%), as illustrated in table (15).

Table 12: Response to surgical treatment

Response	No. of patients	%
Responded	30	75
Not responded	10	25
Total	40	100

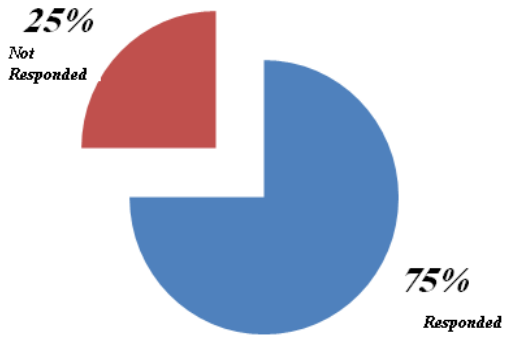

Figure 8: Response to surgical treatment

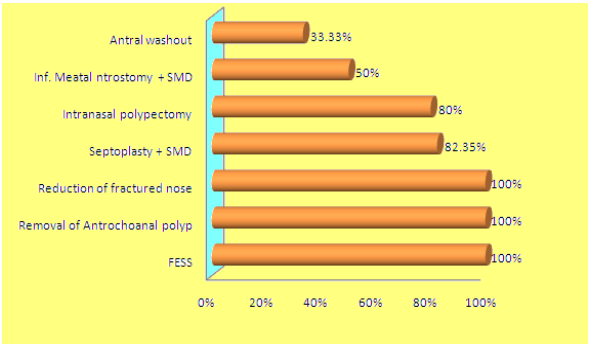

Figure 9: Response to treatment according to the type of surgical treatment

Fourteen patients (82.35%) from 16 were improved following septoplasty and submucosal dithermy (SMD) and 3 patients didn't show any improvement. Other results are further illustrated in table (15):

Table 13: Response to treatment according to the type of surgical treatment

Surgical treatment	No. of patients followed up	No. of patients improved	%
FESS	4	4	100
Removal of Antrochoanal polyp	2	2	100
Reduction of fractured nose	2	2	100
Septoplasty + SMD	17	14	82.35
Intranasal polypectomy	5	4	80
Inf. Meatal ntrostomy + SMD	4	2	50
Antral washout	6	2	33.33
Total	40	30	75

3. Discussion

The patient with facial pain presents a diagnostic challenge. Difficulties arise because of the frequency of referred pain and the overlap in symptoms between different conditions [1].

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 pain can be attributed to other causes [19]. From otolaryngologist's point of view, there are multiple causes for the frequent symptom of facial pain and headaches [20].

This study included 140 adult patients complained of facial pain. Ninety five cases of them (67.86%) were found to be related to the nose and paranasal diseases, and the remainder was distributed among other various diseases, mainly tension headache and TM joint disorders. Stroud also found that headache and facial pain are common ailments with many varied causes and are commonly encountered in otolaryngologic practice [5].

Regarding symptoms associated with facial pain, it was found that nasal obstruction was the commonest symptom (84.21%), followed by nasal discharge (71.57%), postnasal discharge (62.11%), sore throat (36.84%), fever (22.11%), fullness of ear (17.89%), ear pain and snoring (15.79%), epistaxis (13.86%), sneezing (11.57%), limited mouth opening and eye pain (7.36%), jaw pain, parasthesia of face and swollen neck gland seen in (2.11%) while photophobia was seen in only (1%) of cases. This is illustrated in table (4).

Nasal examination revealed congested nasal mucosa in (56.84%), normal in (29.47%) and pale in (13.69%). Purulent nasal discharge seen in (31.58%), mucoid in (30.52%), watery in (7.36%) and bloody in (1.05%). Septal deviation noted to be mild in (52.63%), moderate in (9.47%) and sever in (6.31%).

Other nasal finding, postnasal discharge was the commonest (62.11%), followed by facial tenderness (30.52%), turbinate hypertrophy (20%), nasal mass (9.47%) bruising and face swelling (2.11%). As illustrated in table (5).

Endoscopic examination done for all of the 95 patients, finding were as follows: purulent discharge was the

commonest finding (33.68%), followed by inferior turbinate hypertrophy (18.95%), septal deviation (17.89%), nasal mass (10.52%), middle turbinate hypertrophy and necrotic patch (6.31%), spur in (5.26%) and in (22%) there was no finding, (table 5).

The plain radiographs were normal in only 18 patients (18.94%). The majority of the findings were opaque sinus (33.68%), mucosal thickening (24.21%), opaque nasal cavity and sinus (15.78%) and fluid level in (5.26%). This study shows that the majority of patients complaining of facial pain due to sinonasal diseases have findings of sinus opacity. In another study, ***Huumonen et al*** found that subjects with facial pain did not show significantly more pathological findings in teeth, periodontium, maxillary sinuses, TMJs or in other areas compared to control group. Radiographic panoramic findings had no association with reported facial pain in population and have little impact on the diagnosis of facial pain [21].

Zaineb Al-alawi in her study found that the most of patients (35.9%) of facial pain had no abnormal findings in plain radiography and (25.8%) had mucosal thickening, while only (21.6%) had sinus opacity [22].

The commonest cause of facial pain in this study was acute sinusitis (26.31%) followed by chronic sinusitis (20%), septal deviation (17.89%), allergy (7.39%), mucormycosis and nasal polyp (6.31%), antrochoanal polyp (5.26%), fracture nasal bone (4.21%), concha bullosa and septal hematoma (2.11%), , maxillary carcinoma and nasopharyngeal carcinoma (1.05%).

This study revealed that the most common cause of facial pain was acute sinusitis.

Strohm et al, showed that the most common cause of pain affecting the forehead and midfacial region is acute sinusitis [23].

Stroud [5] ***and Dowson***[24] also found that acute sinusitis was the most common cause of facial pain seen by otolaryngologist.

Fahy et al, found that (2.6%) of patients with facial pain and had no pus was due to their nasal polyposis [15].

Mellissa et al, in a study on 186 patients, showed that (60%) had chronic sinusitis, (19.3%) had allergic rhinitis, (11.8%) non allergic rhinitis and (7.5%) had tension headache, migraine headache and tempromandibular joint dysfunction [25].

A study conducted by ***Marbach et al*** revealed different results. It show that Myofacial pain dysfunction form (52.9%), degenerative arthritis of the tempromandibular joints (16.6%), trigeminal neuralgia (15.3%) and a variety of other pain syndromes in (15.2%) [26].

Zaineb Al-alawi revealed similar results. She found that (32.5%) of the patients were due to acute sinusitis and (24.2%) were due to chronic sinusitis and allergy in (11.6%) [22].

The management of these cases was surgical in 53.69% and medical in 46.31% of the cases.

Surgical treatment was in the form of septoplasty and submucosal diathermy of inferior turbinate in majority (33.3%), antral washout (13.7%), intranasal polypectomy, functional endoscopic sinus surgery antrostomy and submucosal diathermy of inferior turbinate (11.7%), removal of the antrocoanal polyp (9.8%) and reduction of fracture nasal bone in (7.8%).

Seventy five percent of the patients responded to treatment by relieving the pain 3 months after the surgery. The best result obtained from FESS, removal of antrocoanal polyps and reduction of fractured nose which was 100% for each one, while 82.35% of the patients treated by septoplasty improved and got free from headache following the surgery (table 10).

Similar study was done by ***Harley et al*** revealed significant statistically improvements were observed in the patient population with respect to 8 of the 10 clinical outcomes measures. Importantly, a decrease in the severity and frequency of the headaches was noted after surgery, especially after the correction of contact points [27].

4. Conclusion

From this study we can conclude that:

1) The majority of patients presented with facial pain are due to sinonasal a disease in which acute sinusitis is the commonest cause.
2) More than half of the cases of ENT related facial pain are treated surgically.
3) Surgical treatment gives good results in some cases related to sinonasal diseases.

5. Recommendations

Serious illness as maxillary carcinoma and nasopharyngeal carcinoma may masquerade as facial pain, although not an early symptom. So all patients with facial pain must be seen by otolaryngologist and good assessment is needed through history, examination and investigation before diagnosing patient to have a simple sinonasal infection.

References

[1] Jones N.S. Facial pain and Headache. Scott Brown's Otolaryngology. Rhinology. 6th ed. Vol. 4. Butterworth Heinemann, 1997:21:1-9.
[2] Staats P.S. and Patel N. Pain and Management in the head and neck patient. Cumming's Otolaryngology, head and neck surgery. 4th ed. Vol. 1. Mosby-Elsevier, 2005:454-455.
[3] Moore K.L. The head. Clinically oriented anatomy. 3rd ed. Williams and Wilkins, 1992:637-671.
[4] Patten J. Facial pain. Neurological differential diagnosis. London-Harold Starke, 1977:224-230.
[5] Stroud R.H., Bailey B.J. and Quinn F.B. Facial Pain and Headache. Grand rounds Presentation, UTMD, Dept. of Otolaryngology. 2001 Jan 31.

[6] Stammberger H. (1991) Secretion transport in Functional Endoscopic Sinus Surgery p.p 17-46. {c.f. Loke D., Menon K., Jebreel A., Wu K. and Stafford N. The Management of Facial Pain. The internet Journal of Otorhinlaryngology. ISSN: 1528-8420}.
[7] Kopp W., Stammberger H. and Fotter R. (1998) Special radiologic image of the paranasal sinuses. Fur. J. Radiol.; 8:152-156. {c.f. Loke D., Menon K., Jebreel A., Wu K. and Stafford N. The Management of Facial Pain. The internet Journal of Otorhinlaryngology. ISSN: 1528-8420}.
[8] Adams R.D and Victors M. Headache and other craniofacial pains. Principles of neurology. 5th ed. McGraw-Hill, 1993:149-169.
[9] Dalessio D.J. Wolff's headache and other head pain. New York: Oxford University Press, 1987. {c.f. Bradfield J.J., Quinn F.B. and McCracken M. Headache and facial pain. Dept. of Otolaryngology, UTMB, Grand rounds. February, 1991}.
[10] Brain D. The nasal septum. Scott Brown's Otolaryngology. Rhinology. 6th ed. Vol. 4. Butterworth Heinemann, 1997.
[11] Bradfield J.J., Quinn F.B. and McCracken M. Headache and facial pain. Dept. of Otolaryngology, UTMB, Grand rounds. February, 1991.
[12] Homsiglou E., Balatsouras D.G., Kaberos G.A., Katatomichelakis M. and Danielides V. Pneumatized superior turbinate as a cause of headache. Head Face Med. 2007; 3:3.
[13] Gleeson M. Fractures of the facial skeleton. Scott Brown's Otolaryngology. Rhinology. 6th ed. Vol. 4. Butterworth Heinemann, 1997.
[14] Drake-Lee A.B. Nasal polyps. Scott Brown's Otolaryngology. Rhinology. 6th ed. Vol. 4. Butterworth Heinemann, 1997.
[15] Fahy C. and Jones N.S. Nasal polyposis and facial pain. Clin. Otolaryngol. 2001; 26:510-513.
[16] O'Donell B.F. and Black A.K. Conditions of the external nose. Scott Brown's Otolaryngology. Rhinology. 6th ed. Vol. 4. Butterworth Heinemann, 1997.
[17] Levine H.L. Patients with headache and visual disturbances (A differentiation between migraine and sinonasal headache). Arch Otolaryngol Head Neck Surg. 2000; 126:234-235.
[18] West B, Jones NS. Endoscopy negative, CT negative facial pain in nasal cilinc. Scott Brown's Otolaryngology. 7th edition. vol. 2, 2007:1726.
[19] Loke D., Menon K., Jebreel A., Wu K. and Stafford N. The Management of Facial Pain. The internet Journal of Otorhinlaryngology. ISSN: 1528-8420.
[20] Reiss M. and Reiss G. Otorhinolaryngologic causes of headache. Schweiz Rundsch Med Prax. 1999 May 27; 88(22):992-7.
[21] Huumonen S., Sipila K., Zilting P. and Raustia A.M. Panoramic findings in 34- year old subjects with facial pain and pain free controls. J. Oral Rehabil. 2007 Jun; 34(6):456-62.
[22] Facial pain in relation to sinonasal diseases: A thesis submitted to Scientific Council of Otolaryngology by Zaineb Al-alawi supervised by professor dr.Musaid Al-Badri. 2008.
[23] Strohm M. and Gottmann D. [Also consider sinusitis in facial pain: wisdom tooth, tumour, acute parotitis]. MMW Fortschr Med. 2003 May 8; 145(19):26-8.
[24] Dowson A.J. Facial pain. The pharmaceutical journal. 2002 February; 215-217.
[25] Pyonnen M.A. and Terrell J.E. Conditions that Masquerade as Chronic Rhinosinusitis. Arch Otolaryngol Head Neck Surg. Vol. 132, July 2006.
[26] Marbach J.J. and Lipton J.A Treatment of patients with temporomandibular joint and other facial pain by otolaryngologists. Arch. Otolaryngol. Head Neck Surg. Vol. 126, Feb. 2000.