

Facial Pain: Evaluation and Treatment in the Emergency Room

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Abstract

Facial pain and headache are common complaints of patients presenting to a hospital emergency room and clinicians, in general, are more comfortable evaluating and treating the primary and secondary headache syndromes. The evaluation of facial pain, however, provides more of a challenge, as medical personnel are often not as well versed in the differential diagnosis of the disorders that are the source of the discomfort. Our goal in this paper is to provide an easy framework for the acute evaluation and treatment of patients presenting to the emergency room with facial pain that is not the result of a primary headache disorder.

Keywords: Facial pain; Facial neuralgia; Eye pain; Trigeminal nerve disorder; Orofacial pain

Background

Orofacial pain is a complex symptom that requires the clinician to consider a myriad of etiologic possibilities. The prevalence of orofacial pain has been estimated to affect up to 26% of the population and may become a chronic problem in 7% [1,2]. Secondary pain due to structural disease causing inflammation or destruction of the cranial bones, neck, eyes, ears, temporomandibular joint, sinuses or cervical arteries must be identified and treated with alacrity. Primary disorders including the cranial neuralgias and centrally mediated pain syndromes can be disabling and early diagnosis and treatment are essential. Intracranial pathology must be considered but fortunately is an uncommon cause of facial pain.

Disorders of Cranial Bone

- Scalp infection/ Osteomyelitis
- Multiple Myeloma
- Paget's Disease
- Neoplasms with Periosteal Involvement such as
- Osteoma [3,4].

Symptoms

Most disorders of the cranial bones are not associated with head pain as bone is relatively insensate. Scalp vessels, muscles, skin and the periosteum are highly pain sensitive.

Signs

- Local tenderness
- Increased warmth;
- Erythema;
- Bony mass

Workup and treatment

- Palpation of the skull should be performed.
- Skull X rays
- CT of the skull
- Bone scan
- Additional workup and treatment will depend on the specific cause.

Disorders of the Sinuses

Migraine and Tension Type Headache are often erroneously diagnosed as "sinus headache". Pain in the face and ears from a true sinus headache develops simultaneously with the onset of an acute infection and resolves within one week of successful treatment or remission. Chronic sinusitis rarely causes facial pain or headache. Sphenoiditis may have a thunderclap onset and unlike an acute infection in the other sinuses is usually not accompanied by nasal congestion or discharge. The pain is severe, interferes with sleep and is resistant to analgesics.

Complications include bacterial meningitis, subdural abscess and cortical vein and cavernous sinus thrombosis [4-13].

Symptoms

- Frontal or maxillary pain. The pain from sphenoiditis may be occipital, frontal, temporal or periorbital.
- Facial tenderness, congestion, purulent nasal discharge (except sphenoiditis)
- Fever
- Halitosis
- Anosmia
- Sphenoiditis is aggravated by bending, standing and walking and unlike other sinus infections may be accompanied by nausea and vomiting.
- The pain from sphenoiditis often does not respond to narcotic agents.

Signs

- Local tenderness
- Purulent nasal discharge;
- Halitosis;

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- Fever

Workup

CT scan of the sinuses or an MRI

Treatment

- Antibiotics
- ENT evaluation

Disorder of the Eyes

Ocular causes of headache and facial pain are uncommon. Pathologic processes affecting the eye and structures controlling eye motility causes localized pain. Ophthalmologic evaluation is mandatory to exclude glaucoma, corneal disease, uveitis, scleritis/episcleritis, neoplastic disease, vascular abnormalities and infection. Acute angle closure glaucoma will cause retro and periorbital pain, conjunctival injection, corneal clouding and blurred vision. Heterophoria, heterotropia and refractive errors may cause a mild frontal ache or dull eye pain but never severe head or facial pain. Ocular inflammatory disorders such as optic neuritis cause pain and loss of vision in the affected eye. Painful ophthalmoplegia may be the result of ischemic neuropathy affecting the third, fourth or sixth cranial nerves. Diabetes mellitus, collagen vascular disease, giant cell arteritis, aneurysm and infection must be considered. Cavernous sinus thrombosis may cause unilateral eye pain with proptosis, chemosis and ophthalmoplegia. Pituitary apoplexy causes the sudden onset of headache and eye pain accompanied by an oculomotor nerve deficit. The abducens and trochlear nerves may or may not be involved. Tolosa Hunt syndrome is an idiopathic inflammatory disorder of the cavernous sinus or orbital apex that causes painful ophthalmoplegia with involvement of the 3rd, 4th and sixth cranial nerves [14-27].

Workup and treatment

- MRI scan of the brain and orbits and an MRA are mandatory in the workup of ophthalmoplegia.
- A sedimentation rate and C reactive protein should be performed if giant cell arteritis is suspected. If elevated or if the index of suspicion is high then the patient should be placed on prednisone and a temporal artery biopsy should be performed.
- Untreated, Tolosa Hunt syndrome lasts approximately 8 weeks. Treatment with steroids will effect an improvement within 72 hours.

Dental and Oropharyngeal Disorders

Constant aching pain in the distribution of the 2nd and 3rd divisions of the trigeminal nerve is often the result of dental caries or apical root infection. Superimposed "jabbing pain" may occur. The pain is aggravated by hot and cold fluids and there may be local swelling and tenderness to palpation [28-30].

Workup and treatment

Dental evaluation and treatment with radiographs as indicated.

Burning Mouth Syndrome

Persistent burning in one or several oral structures, occurring more commonly in postmenopausal women. The tongue is frequently involved and the discomfort may be accompanied by a dry mouth or altered sense of taste [31,32].

Workup and treatment

An underlying Candida infection must be ruled out.

Laboratory testing to rule out diabetes mellitus, thyroid disease, Sjogren's syndrome and nutritional deficiencies.

ENT or Oral surgery evaluation as indicated

Treatment may include tricyclic antidepressant medication, SNRI, antiepileptic drugs, clonazepam and oral rinses.

Neck Tongue Syndrome

Acute onset of pain in the upper cervical region into the occiput lasting seconds to minutes in association with dysesthesias and numbness of the ipsilateral tongue. The symptoms are precipitated by rotation of the neck causing compression of the C2 nerve root. The symptoms can occur in rheumatoid arthritis or with congenital laxity of the atlanto-axial joint [33].

Workup and treatment

Cervical MRI scan

Non-steroidal anti-inflammatory drugs

C2 nerve block

Neurosurgical consultation as indicated

Gradenigo Syndrome

Unilateral and sensory disturbance in the distribution of the ophthalmic division of the trigeminal nerve accompanied by ipsilateral lateral rectus palsy. A partial Horner's syndrome (without anhidrosis) may occur. Etiologic possibilities including metastatic cancer and osteitis. Otitis media with leptomeningitis must be considered [34].

Workup and treatment

- Contrast enhanced brain MRI
- ENT evaluation

Carotid Dissection

Sudden or gradual onset of anterior neck or hemicranial pain involving the eye or face often associated with neurological symptoms and signs that suggest a stroke and an ipsilateral Horner's syndrome. There may be a history of antecedent trauma, violent coughing or sneezing [35-38].

Workup and treatment

- MRI of the brain and MRA / CTA of the great vessels of the neck.
- Neurologic consultation for management.

Temporomandibular Disorder

Pain in the temporomandibular joint (TMJ) may be the result of traumatic, inflammatory, congenital developmental or neoplastic disease. The pain is localized to the jaw, temporomandibular joint and muscles of mastication. Examination may reveal asymmetric mandibular motion with local tenderness to palpation. Crepitations are only significant if there is associated pain. Restricted movement of the jaw is not required to make a diagnosis [32,39,40].

Workup and treatment

Symptomatic relief can be obtained with a nonsteroidal anti-

inflammatory drug .

Referral to dentistry for an evaluation and management.

Herpetic/Postherpetic Neuralgia

Herpes Zoster usually affects people over the age of 60, and is slightly more common in males. The rash is in a trigeminal distribution in approximately 23% of cases, most often affecting the ophthalmic division, herpes zoster ophthalmicus. The rash may involve the external auditory meatus and when associated with a facial palsy is referred to as the Ramsey Hunt syndrome. The burning pain may precede the rash by 2 to 4 days. Chronic pain that persists after resolution of the rash, Post Herpetic Neuralgia (PNH), occurs in 14% of males and 25% of females, most over the age of 60 [41-48].

Workup and treatment

The acute infection should be treated with a high dose of an antiviral agent (acyclovir, valacyclovir, famciclovir) within 72 hours of the appearance of the rash. Early treatment may prevent the development of PNH.

Chronic PNH can be treated with tricyclic antidepressant medication (such as amitriptyline), Gabapentin, Pregabalin or Duloxetine. Sympathetic nerve block can be considered.

Trigeminal Neuropathy [42-44,46-51]

Unilateral (rarely bilateral) facial pain accompanied by numbness, paresthesias and sensory loss. A depressed corneal reflex and trigeminal motor paresis may occur. Etiologic possibilities include infectious (Viral, Syphilis, Lyme's disease), a manifestation of an underlying collagen vascular disorder or neoplasm.

Workup and treatment

- Laboratory testing and a contrast enhanced brain MRI.
- Treatment of the pain with tricyclic antidepressant medications, anticonvulsants, Duloxetine.

Raeder's Paratrigeminal Syndrome

Unilateral facial, retro orbital or head pain, associated with a partial Horner's syndrome consisting of meiosis and ptosis without anhidrosis and trigeminal involvement on the same side. Causes include trauma, tumor, infection and aneurysm [47].

Workup and treatment

- Contrast enhanced brain MRI.
- Management will depend on the etiology

Intracranial Lesions

Inflammation or traction on the pain sensitive structures, meninges, cranial nerves and blood vessels, may cause referred pain to the face. Neoplasms may cause dull, nonpulsatile persistent pain aggravated by exertion or change in position. Tumors that may cause facial pain include meningioma, schwannoma, neurofibroma, cholesteatoma, pituitary tumor and nasopharyngeal cancer. Thalamic lesions including stroke may cause unilateral facial pain and dysesthesias. Constant, severe, aching pain in the face with radiation into the ear may be the result of lung cancer [3,52,53].

Workup and treatment

If neoplasm is suspected then a brain MRI with gadolinium should

be performed.

Chest X ray and possibly chest CT scan should be considered for unexplained facial pain.

Referral to Neurosurgery as indicated.

Orofacial Pain of Central Neurovascular Origin

The clinician must be aware of the fact that the primary headache disorders including migraine with and without aura, primary exertional headache, primary stabbing headache, cluster headache, chronic and episodic hemicrania, SUNCT and SUNA syndrome may present with facial pain without a headache per se. Several specific headache syndromes commonly present with eye or facial pain and are often incorrectly diagnosed in the emergency department. It is beyond the scope of this discussion to discuss the primary headache disorders [54-57].

Primary Stabbing Headache

Characterized by fleeting paroxysmal pain lasting between 1 and 10 seconds. The pain can be severe and is often located in the eye. The frequency is variable from once per year to 50 per day. More than 50% of the patients have another underlying primary headache disorder. Stabbing pain has been associated with giant cell arteritis and meningiomas [56,57].

Workup and treatment

Must rule out secondary headache- sedimentation rate, complete blood count and a contrast enhanced Brain MRI should be performed.

Indomethacin is effective in most patients with primary stabbing headache.

SUNCT Syndrome

Short lasting unilateral neuralgiform pain with conjunctival injection, tearing, rhinorrhea and sweating, is usually localized to behind one eye and is more common in males. The pain is severe, lasting 6- 600 seconds, and may occur up to 200 per day [58].

Workup and treatment

MRI with gadolinium should be performed to exclude lesions in the posterior fossa and pituitary.

The pain often does not respond well to treatment. Lamotrigine is the first line medicine followed by gabapentin, pregabalin, topiramate, and carbamazepine.

Cluster Headache [3,4,55,59,60]

Cluster headache may present as oro-facial pain and many patients have unnecessary dental procedures before the diagnosis is made. The maxillary region is most often involved. The disorder is three to four times more likely to occur in men than women and the mean age of onset is 28. Most patients suffer from the episodic form with attacks occurring from once every other day to 8 per day in cycles lasting weeks to months. When attacks recur without remission of more than one month for more than one year this is referred to as chronic cluster headache. There is often a seasonal preponderance with cycles occurring more commonly in the spring or fall.

Symptoms

Severe unilateral pain that is usually retro and periorbital to temporal, but may be maxillary in location.

The pain lasts 15 minutes to 3 hours with up to 8 attacks per day. A sense of restlessness often accompanies an attack and nausea may not be a prominent feature.

Signs

- Ipsilateral conjunctival injection and/or increased lacrimation.
- Ipsilateral nasal congestion or discharge
- Ipsilateral meiosis and/or ptosis (partial Horner's syndrome)
- Ipsilateral eyelid edema-ipsilateral facial sweating neurologic exam is otherwise normal

Workup

- Contrast enhanced brain MRI scan

Treatment

- Abortive
- 4 mg or 6 mg sumatriptan SC
- Oxygen 100% at a flow rate of 7-10 liters/min for 10- 15 minutes with a non-rebreather mask
- 1 mg of Dihydroergotamine IV/IM/SC –

Preventative

Verapamil, lithium, valproic acid, a short term tapering course of prednisone beginning at 60-80 mg.

Neuralgiform Disorders –Painful Cranial Neuropathies

Trigeminal neuralgia

The peak onset is in the 5th and 6th decades and is slightly more common in women. Classical trigeminal neuralgia does not have an underlying cause, however, if surgical intervention is performed, an aberrant vascular loop, usually the superior cerebellar artery, contacting the trigeminal nerve is often found. Symptomatic or secondary trigeminal neuralgia can be the result of meningiomas, neuromas, myeloma, metastasis to the sphenoid, cholesteatomas or basilar artery aneurysms. Multiple Sclerosis should be considered in all patients under the age of 50 who develop the disorder. With symptomatic/secondary cases there may be a sensory deficit [4,61-63].

Symptoms: Paroxysms of severe lancinating pain lasting 1 sec to 2 minutes. Distribution usually in regions supplied by the maxillary and mandibular divisions of the trigeminal nerve. The ophthalmic division is involved in less than 5% of cases. Occasionally all three divisions are involved and when the pain occurs bilaterally Multiple Sclerosis should be suspected. Multiple attacks may occur during the day but episodes are usually not nocturnal. "Trigger zones" usually around the nose and lips may evoke pain if stimulated and brushing the teeth, chewing, washing the face and exposure to a cool breeze may precipitate an attack. A dull ache may occur between the painful episodes but constant facial pain is never the result of classical trigeminal neuralgia. Severe paroxysmal pain may evoke muscle spasm of the ipsilateral face mimicking a tic, hence the name tic douloureux. Classical trigeminal neuralgia is never accompanied by a neurologic deficit. Periods of remission may occur. May occur in association with Cluster headache- "Cluster-Tic syndrome"

Signs: Trigger zones; facial "tic" in association with the pain. With symptomatic/secondary cases there is a sensory deficit.

Workup: Contrast enhanced brain MRI/MRA with sequencing to evaluate arterial and venous structures.

Treatment: Carbamazepine is the drug of choice. Other medications that have been shown to be efficacious include gabapentin, oxcarbazepine, clonazepam, pregabalin, lamotrigine and baclofen. Opioids should be avoided. Before beginning an anticonvulsant medication in a patient of Asian origin the HLA B1502 should be checked because of the increased possibility of a serious skin reaction. Neurosurgical intervention can be considered for patients who do not respond to medical therapy.

Glossopharyngeal neuralgia

Severe paroxysmal pain lasting from 1 second to 2 minutes in the tonsil, tongue and larynx radiating from the oropharynx into the ipsilateral ear. Attacks may occur 5-30 times/day and can be nocturnal. A deep dull pain often occurs between exacerbations. Paroxysms may be triggered by swallowing (especially cold liquids), talking, coughing or yawning. The pain is often associated with coughing, hoarseness and syncope. Like trigeminal neuralgia vascular compression is often the cause. Cerebellopontine angle tumors, carotid aneurysms, peritonsillar abscesses and nasopharyngeal carcinoma can cause symptomatic glossopharyngeal neuralgia. This type of neuralgia is rare, more common in females, usually presents in the 6th decade and may occur in association with trigeminal neuralgia [63-65].

Workup and treatment: Contrast enhanced brain MRI/MRA with sequencing to evaluate arterial and venous structures. Treatment with carbamazepine, gabapentin, pregabalin or baclofen. Neurosurgical intervention for patients who do not respond to medical therapy.

Nervus intermedius neuralgia (geniculate neuralgia)

This is a branch of the facial nerve and presents with severe sharp lancinating pain in the auditory canal lasting seconds to minutes. Touching the pinna or external auditory canal will precipitate an attack and the pain may be associated with excessive salivation, tinnitus, rhinorrhea, or a bitter taste. The disorder is rare, affecting middle aged adults and is more common in females [64,66].

Workup and treatment: Contrast enhanced brain MRI. Treatment with carbamazepine, gabapentin, pregabalin or baclofen.

Superior laryngeal neuralgia

Paroxysmal unilateral submandibular pain, lasting seconds to minutes, radiating into the ipsilateral ear, eye, or shoulder precipitated by swallowing, coughing, yawning, sneezing, head turning, straining voice or blowing the nose. The pain is accompanied by the urge to swallow, which then exacerbates the pain, and causes an inability to speak. This rare disorder affects middle aged men and may occur as a result of damage to the superior laryngeal nerve during carotid endarterectomy [64,67].

Workup and treatment: Contrast enhanced MRI scans of the neck and brain. Local blockade of the superior laryngeal nerve is diagnostic. Neurectomy effectively cures the condition.

Nasociliary neuralgia

Stabbing pain, lasting from seconds to hours, on one side of the nose radiating upward into the mid frontal region. The pain is precipitated by touching the lateral aspect of the ipsilateral nostril [4,68].

Workup and treatment: Contrast enhanced Brain MRI. Block or section of the nasociliary nerve or application of an anesthetic to the ipsilateral nostril.

Supraorbital neuralgia

Constant or paroxysmal pain in the region of the supraorbital notch and medial aspect of the forehead with tenderness of the supraorbital notch [64,69].

Workup and treatment: Contrast enhanced Brain MRI. Anesthetic block or ablation of the supraorbital nerve.

Ophthalmoplegic Migraine

Recurrent headache with migrainous features associated with paresis of one or more ocular cranial nerves, most commonly the 3rd nerve, in the absence of an intracranial lesion. The headache may last for a week or more and the ophthalmoplegia begins within 4 days of the onset [70-73].

Workup and treatment

Contrast enhanced Brain MRI and an MRA. MRI scan may reveal changes within the affected nerve. This disorder does not appear to be a variant of migraine and may represent a recurrent demyelinating neuropathy. Steroids have been used with mixed results

Persistent Idiopathic Facial Pain

Daily unremitting poorly localized, aching facial pain, formerly referred to as atypical facial pain, that initially is confined to one side of the face but over time may spread to involve a wider area and can become bilateral. Paroxysms are absent and while the patient reports severe pain they do not appear to be obvious distress. The patient does not have neurological symptoms or autonomic accompaniments and examination does not reveal evidence of physical signs. Depression and anxiety often accompany chronic facial pain and may be contributing factors or the result of long term suffering [57,74-76].

Workup and treatment

- Laboratory testing including sedimentation rate.
- Chest X ray and if there are risk factors for lung cancer a CT of the chest
- Appropriate brain and face imaging to exclude sinus neoplasms, nasopharyngeal cancer, skull based abnormalities and dental disease.
- Treatment can include tricyclic antidepressant medication, anticonvulsant medication and non pharmacologic treatment techniques including cognitive behavioral therapy.

Conclusion

Facial pain is an extremely common problem and when patients present to the hospital emergency room with orofacial pain, it is imperative that an accurate diagnosis be made so that an effective treatment plan can be implemented. Emergency room assessment is not afforded the luxury of a methodical evaluation with clinical follow up over time and we have presented a framework for the rapid identification of disease entities that may cause orofacial pain and a focused approach to the evaluation and treatment of such disorders. Subspecialty consultation with neurology, otolaryngology or dentistry should always be obtained when the etiology of the pain is not clear and for ongoing evaluation and treatment. Patients with chronic facial pain often suffer from depression and anxiety and long term psychiatric treatment can be beneficial.

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