Cutaneous Sinuses of Cervicofacial Region: A Clinical Study of 200 Cases

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Abstract

Purpose To evaluate the sinuses in the cervicofacial region and to identify the focus of infection. It is also to help the clinician in differentiating the sinuses' of odontogenic and nonodontogenic focus of infection.

Materials and Methods The study has been conducted in 200 patients, aged between 11 and 77 years for a period of 6 and a half years at Narayana Dental College and Hospital, Nellore. History of present illness, clinical, radiological and laboratory examinations were carried out on all the patients.

Results Majority of the cervical sinuses are of odontogenic origin (80%) and non-odontogenic being (20%) of the cases.

Conclusion The literature reveals that many cases have been misdiagnosed and inappropriately treated by many specialties of Medicine and Surgery wherein the odontogenic foci of infection is the main etiological factor for cervicofacial sinuses. A proper diagnosis is important and forms a key to the successful management of these sinuses in the head and neck region.

Keywords Cutaneous sinuses · Odontogenic infection · Osteomyelitis · Parotid fistula

Introduction

The cutaneous sinuses are common clinical entities that occur any where on the body. The cutaneous sinuses of cervicofacial region comprise an important group of lesions which may present to specialists in numerous specialties of medicine [1].

The sinuses are of two types: (a) congenital sinus (b) acquired sinus. The congenital sinuses are due to developmental defects of adjoining parts in the fetus. The sinuses which have congenital origin include preauricular sinus, congenital sinuses of lips, thyroglossal duct sinus and branchial fistula. The preauricular sinuses and congenital sinuses of lips are sometimes associated with other deformities such as cleft palate, hare lip etc. [1]. The acquired sinuses are due to a spontaneous rupture of a deep seated infection, inadequate surgical treatment like non-dependent drainage etc. These sinuses are different from anatomical sinuses called paranasal sinuses. The paranasal sinuses are pneumatic or air filled cavities lined with ciliated pseudo stratified, columnar epithelium restricted to skull bones in man.

The acquired sinuses in the cervicofacial region are due to odontogenic infection, skin infection, trauma [2] and specific infections like actinomycotic and tuberculous infections. Middle ear infection, parotid abscess, maxillary sinus infections rarely produces sinuses in the vertical ramus region. Submandibular sialolith produces sinus in the submandibular region. Cervicofacial actinomycosis produces multiple abscesses in the upper part of the neck usually posterior to the angle of the mandible. These

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abscesses usually produce multiple fistulae through which pus discharges. Tuberculous infection produces caseous necrosis of cervical lymph nodes and produces sinus in the upper part of the neck [2, 3]. Traumatic injuries involving the cheek may transect the parotid duct and produces a cutaneous parotid fistula. Rarely large cysts like dentigerous cysts and keratocysts produce cutaneous sinus [2].

Sinuses are generally evaluated by history, clinical examination and radiological examination. Sometimes the etiology may be obscure, in such cases inserting radiopaque substances into the sinus tracts and taking an appropriate radiograph may be helpful in identifying the source of infection. Review of literature on this aspect has shown that a large number of cases have been misdiagnosed and inappropriately treated resulting in recurrence of the lesion.

Materials and Methods

Patients who reported to the Department of Oral and Maxillofacial Surgery, Narayana Dental College, Nellore, India between May 1st 2004 to October 31st 2010 were included in the study. 200 patients were considered for the study out of which 124 patients (62%) were men and 68 patients (34%) were women and 8 patients (4%) were children. Patients aged between 11 and 77 years (mean age of 30 years) were considered in the study. Patients with cervicofacial sinuses with or without discharge were included in the study. Patients with congenital sinuses were excluded from the study.

A detailed history regarding dental caries, oro-facial infections, its duration and previous surgical procedures were obtained subjectively. Clinically, both extra oral and intra oral examination were preformed. Extra orally, on inspection localization of the sinus, size, number, type of discharge with any scarring and/or pigmentation of the adjacent skin were noted. Palpation of the sinus was done for tenderness, thickening of the wall of the sinus and induration.

Intraorally all the teeth were examined for caries, periodontal pathology, pericoronal infection, fracture and mobility. Labial and buccal sulci were palpated for a fibrous tract. Hard palate, soft palate, tongue, floor of the mouth and tonsils were also examined for any change in normalcy.

Routine blood and urine investigations were carried out to rule out the systemic involvement. Appropriate radiographs were taken. Microbiological examination was carried out in patients with discharge for the antibiotic sensitivity. Diagnosis of cervicofacial sinuses in the present study was based on history, clinical and radiological presentation.

Results

In our study 80% of the cervicofacial sinuses were of odontogenic origin and 20% were attributed to non-odontogenic origin (Graph 1). 72 patients (36%) were below the age of 20 years, 92 patients (46%) were between 21 and 40 years, 28 patients (14%) were between 41 and 60 years and only 8 patients (4%) were above the age of 60 years (Table 1). The maximum numbers of patients with cervicofacial sinuses were observed below the age of 40 years (82%) that is attributed to the high incidence of dental caries and pericoronal infections.

In 28 patients (14%), sinuses were present in the maxilla and in 168 patients (83%) sinuses were present in the mandible, only 4 (2%) patients had reported with sinuses in the cervical region. In the head and neck region mandible was more commonly involved than the maxilla (Graph 2).

The sinuses present were attributed to the periapical and periodontal pathology in 127 patients (63.5%), pericoronitis in relation to the mandibular third molars in 17 patients (8.5%), chronic osteomyelitis arising from odontogenic infection in 16 patients (8%), infected fractures of the mandible in 14 patients (7%), infected keratocyst in 12 patients (6%), parotid fistula in 8 patients (4%), skin infections (furuncle) in 3 patients (1.5%), tuberculous osteomyelitis of mandible in 2 patients (1%), sub-mandibular salivary calculus in 1 patient (0.5%). Men were more affected than women. The periapical infection

Graph 1 Source of infection

Table 1 Incidence of cervicofacial sinuses with age

S. no.	Age	Percentage (%)
1	0 and 20 years	72 patients (36)
2	21 and 40 years	92 patients (46)
3	41 and 60 years	28 patients (24)
4	Above 60 years	8 patients (4)

Graph 2 Distribution of cases based on region involved

Table 2 Etiology of cervicofacial sinuses

S. no.	Etiology	No. of cases in study
1	Periapical and periodontal infection.	127 (63.5%)
2	Pericoronitis resulting from mandubular impacted teeth	17 (8.5%)
3	Osteomyelitis	16 (8%)
4	Fracture mandible	14 (7%)
5	Infected dentigerous/keratocyst	12 (6%)
6	Parotid fistula	8 (4%)
7	Skin infection(furuncle)	3 (1.5%)
8	Tuberculosis	2 (1%)
9	Sialolith	1 (0.5%)
10	Total	200

contributes to the maximum percentage of the cervicofacial sinuses (Table 2).

Discussion

Cervicofacial sinuses are important group of lesions concerned with different specialties of medicine that includes oral surgery, dermatology, general medicine, general surgery, orthopedics, plastic surgery, surgical oncology [1].

Occasionally, the pulp undergoes a slow and silent degeneration without any symptoms [3]. Patients with these cutaneous sinuses often present first to the general practitioner rather than the dental surgeon due to absence of pain from tooth proper. There are numerous reports in the dental literature about these sinuses as compared to the medical literature [3–6].

Cutaneous-dental tract is a channel which drains from a dental focus of infection onto the face and neck. These tracts tend to occur more frequently from the infected mandibular teeth (80%) than maxillary teeth (20%). They

are more common in the submandibular and submental regions of the face. Sinus tracts may result from localized infections from an infected tooth [6, 7] (Picture 1).

The periapical and periodontal infections are the most common causes for cervicofacial sinuses as shown in our study. They arise from dental caries, periodontal pathology, retained roots, traumatic occlusion etc. They appear radiographically as radiolucent areas involving the apical portion of the tooth and surrounding alveolar bone. The spread of infection from teeth and surrounding structures to the skin can be described based on the muscle attachments on the facial bones. The infection travels along the path of least resistance which is guided by muscle attachments and distribution of loose connective tissue in that area [4]. The infection from the canine tooth rarely produces a sinus at the medial angle of the eye. Those arising from the maxillary molars whose roots lie above the attachments of buccinator muscle produce sinuses on the cheek [4].

The periapical and periodontal infections arising from mandibular anterior teeth produces cutaneous sinuses if their roots lie below the origin of mentalis muscle or roots are long. Those arising from premolar teeth produce sinuses (Pictures 1, 2) rarely over the mandible after piercing the triangularis and quadratus muscles of the lower lip. Those arising from mandibular molars produce sinuses if their roots lie below the buccinator muscle on the buccal side or below the attachment of the mylohyoid muscle on the lingual side produce sinuses on the buccal and lingual sides of the mandible respectively. Pericoronal-infection with partially erupted wisdom teeth produces cutaneous sinuses over the submandibular region [7].

According to Kruger, infection spreading from the mandible can find a pathway to the temporal region. The infection may penetrate the periosteum lingually, superior to the mylohyoid muscle and may be located next to the

Picture 1 Odontogenic origin

Picture 2 Odontogenic origin

lingual nerve in the infratemporal fossa. The infection may easily escape from the infratemporal fossa, pass through the mandibular neck and drain into the temporal fossa to perforate the temporal fascia and form temporal sinus tract in this way. If the infection burrows under the superior layer of the deep cervical fascia the point of the discharge may be a more distant site e.g. lower neck, breast, chest etc. In the presence of the erosion the platysma, deep cervical fascia, superficial fascia and the skin, lesion may resemble necrotizing fasciitis, which might require aggressive treatment [8, 9]. Bilateral cutaneous tract [10] were also reported in the literature. Ectopic Teeth rarely produces cutaneous sinuses [11].

Infected fractures, chronic osteomyelitis arising from odontogenic focus of infection (Picture 3) with sequestrum formation may present clinically as a sinus with sprouting granulation tissue at the mouth of the sinus [12], (Picture 4).

Picture 3 Osteomyelitis

Picture 4 Parotid fistula

Cystic lesions such as epidermoid cyst, dermoid cyst, teratoid cyst, large dentigerous cyst, keratocyst may produce cutaneous sinuses. After sufficient period of time the infection perforates the overlying bone and produces a sinus with discharge [13]. Salivary gland sinus or fistulae are usually caused by trauma, surgery and infections. Parotid gland fistula (Picture 4) may arise from infection resulting from trauma, actinomycosis, tuberculosis, syphilis, salivary calculi and malignancies. Parotid duct during its course crosses the outer surface of the masseter muscle and lies close to the skin and is vulnerable to injury. Sialolith rarely produces cutaneous sinuses in the neck [2].

Tuberculous infection of the mouth is usually a secondary infection since tissues of the oral cavity offer resistance to the infection. But reaches to the region of the gingiva by infected sputum during the tooth eruption, extraction, trauma and rarely by haematogenous spread. Infection of the socket following the extraction may rarely lead to facial sinus in patients with pulmonary tuberculosis. Tuberculous infection of a fractured mandible leading to sinus formation has been reported. Assessment of the general health of the patient is a must in all such cases [14].

Skin infections like boil may rarely produce cutaneous sinus with pus discharge. Identifying the exudates draining from the cutaneous sinuses may provide a valuable clue for the diagnosis. In various cases the exudates may prove to be pus, cystic fluid, sweat, saliva [2]. Culture sensitivity test is important in identifying the organisms to rule out fungal origin of infection or syphilitic ulcers. The sensitivity tests are important in employing effective antibiotic therapy and response may not be possible without it [15].

Spread of infection to the multiple areas on the face occurs but the possibility of the skin damage from a chronically infected tooth is overlooked in the evaluation resulting in the recurrence of the lesion [9]. Patients are often unaware of the internal problem and they do not appreciate the relation between the teeth and the skin

lesion. Once the diagnosis of the odontogenic infection is made the tooth should be treated before the skin lesion [12, 16].

As our study reveals it is interesting to note that the cervicofacial sinuses are more prevalent before the age of 40 years owing to increased incidence of dental caries and pericoronal infection. It will be readily apparent from the distribution of the cases in the present study that the odontogenic infection forms the commonest cause and contribute to the maximum percentage of the cases [1, 17].

Clinically a cutaneous sinus tract may be misdiagnosed, leading to inappropriate antibiotic therapy, aspiration, radiotherapy, cautery and surgery. Unless the dental focus of infection is treated recurrence is likely [4]. Intra oral radiographic examinations is a crucial diagnostic tool. Dental assessment will confirm diagnosis and is recommended for any non healing facial and cervical lesions, particularly in submandibular and sub mental regions.

The odontogenic infections that produces a sinus poses a special challenge because of the presenting symptoms. The location of the sinus away from the source of infection poses a diagnostic difficulty and can be identified radiographically by inserting radiopaque materials like gutta percha points, fine orthodontic wire, lacrimal probes and silver probes etc.

Conclusion

The study reveals majority of the sinuses (80%) were due to odontogenic etiology. Only 20% of the cases were attributed to the non odontogenic etiology. Odontogenic and non-odontogenic focus of infection can be delineated by history of toothache, clinical location of the sinus and palpation of the tract. The sulcus between the sinus and the jaw if palpated, a firm, fibrous cord representing the sinus tract may be appreciated. The position of this attachment to the jaw may indicate the site from which the pus is drained. These two procedures are helpful in identifying the source of infection and aid in differentiation of odontogenic focus of infection from non odontogenic focus of infection. Once the odontogenic source of infection is confirmed, the offending tooth is either extracted or treated endodontically

to arrest the further growth of microorganisms. Reasons for the large number of cases observed could be due to relative poverty of the community examined, late referral for treatment and frequent initial misdiagnosis.

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