

Management of facial fistulas and sinuses

Marwan G. Saied, B.D.S., F.I.C.M.S. ⁽¹⁾

Ahmed A. Al-Kinani, M.B.Ch.B., F.I.C.M.S. ⁽²⁾

ABSTRACT

Background: A major difference between the treatment of the skin lesions and the odontogenic and non-odontogenic sinuses. We aimed to analyze a substantial number of consecutive cases in order to clinical suspicion in the differential diagnoses may be correctly weighted.

Materials and methods: The material of this research consisted of 40 patients. A complete history is collected from the patients with the duration and the site of the sinus present, the patient was examined for factors of the fistulas and sinuses and its associations, and patient having any concomitant lesions, a medical consultation done for opinion and management. Clinical examination with facial fistulas and sinuses was mandatory to avoid any mistakes that may occur. A treatment plan was contemplated regarding a conservative line will be followed or a surgical intervention was indicated results.

Results: The common etiological causes: congenital and acquired causes. Fifteen patients have eighteen facial sinuses and fistulas (40.9%) developed because of non-odontogenic infections, fifteen patients had fifteen facial sinuses (34%) because of odontogenic infections, four congenital sinuses (9%) developed at three patients, two patients with two facial sinuses (4.5%) due to tumor growth, three patients with three facial fistulas (6.8%) due to traumatic causes and one patient with one facial sinus (2.2%) because of Actinomyces and unknown cause for each.

Conclusions: The maxillofacial surgeon should be aware of causes of whether developmental anomalies, deep seated infections, epithelization of the tract, insufficient or inadequate drainage, deep lining foreign bodies and certain types of infections.

Key words: Facial fistulas and sinuses, management, odontogenic and non-odontogenic causes. (J Bagh Coll Dentistry 2015; 27(2):123-129).

INTRODUCTION

Facial fistulas and sinuses comprise an important group of lesions which may present to specialists in numerous branches of medicine. The true fistula, an abnormal communication between the lumen of one viscous and the lumen of another body surface, is rare. The more common clinical presentation is the sinus, a blind tract lined with granulations leading from an epithelial surface into the surrounding tissues.

The special consideration for facial fistulas and sinuses are because of their resemblance of its appearances to basal cell carcinoma, sebaceous cyst, and other skin lesions as a furuncle can be misdiagnosed as a sinus tract to the skin of the face ⁽¹⁾ (Table1).

Infective facial fistulas and sinuses

Dental cause

The opening of the sinus may be found at far distance from the dental focus of infection, a sinus from a tooth infection opened on the chest and another on the upper third of the thigh ⁽³⁾.

Dental infections simulating skin lesions ⁽⁴⁾. Cutaneous sinuses tract of dental origin in children ⁽⁵⁾, a dental etiology as part of differential diagnosis should be kept in mind with oro-facial skin lesion ⁽⁶⁾.

Table1: Etiology of facial fistulas and sinuses ⁽²⁾

1	Embryological	Preauricular sinus. Labial region.
2	Infective	Dental causes. Specific infections e.g. T.B., actinomyces. Osteomyelitis. Dental implant. BRONJ
3	Trauma	Transected salivary ducts. Infected fractures. Bullet injury.
4	Carcinoma	Result of carcinomatous growth. Effect of radiation.
5	Miscellaneous	Malnutrition (cancrum oris).

Actinomyces

Actinomyces is a chronic spreading suppurative and granulomatous lesion caused primarily by Actinomyces israelii. Draining sinuses are formed through which the characteristic "Sulphur granules" are discharged. A persistent periapical disease with recurrent sinus tracts, histological diagnosis confirmed actinomyces, the lesion was treated with antibiotics and periapical surgery ⁽⁷⁾.

Osteomyelitis

A case of sinus discharge at infra orbital region after repair of orbital floor defect by a silastic sheet and another case of two sinuses

(1) Maxillofacial Surgeon, Department of Maxillofacial surgery, Al-Wasity Hospital, Ministry of Health

(2) Plastic Surgeon, Department of Plastic surgery, Al-Wasity Hospital, Ministry of Health

discharging at submental region due to infected mandibular fracture⁽⁸⁾.

An additional cause for oral cutaneous fistulas is bisphosphonate-related osteonecrosis of jaws (BRONJ)⁽⁹⁾, so any oral/ dental causes increasing BRONJ include abscesses, periodontal disease. The risk of development of BRONJ with oral bisphosphonate is very small but increase when therapy exceeds 3 years⁽¹⁰⁾.

Dental implant

Dental implants can develop infections, leading to intraoral and possibly extraoral sinus tract drainage⁽¹¹⁾.

Carcinomatous Cause of Facial Fistulae

An orocutaneous fistula can occur after any operation on the oral cavity to remove a tumour and the most important causative factors are previous radiotherapy and inadequate control of nutritional status, diabetes and anaemia in the preoperative period, poor operative technique. Often the fistula will be the result of surgical intervention for the neoplastic disease⁽¹²⁾.

A case of an orocutaneous fistula reported with pathological fracture of the mandible in patient with osteoradionecrosis which followed orthovoltage radiation⁽¹³⁾. Also a case reported of an oropharyngocutaneous fistula in an irradiated patient⁽¹⁴⁾.

MATERIALS AND METHODS

The material of this study consisted of 40 patients with (44) facial fistulas and sinuses (26 males and 14 females and the average was 20years) suffering of a fistula or sinus in the facial region, between September 2009 and November 2013, at the Al-Wasity hospital for reconstructive surgery at Al-Resafa institute of ministry of health, Baghdad- Iraq. They were either referred from other hospitals or outpatient clinic of the same hospital. The common an etiological cause were divided into two groups: Congenital and acquired causes and the acquired causes divided into odontogenic infection, non-odontogenic infection, traumatic, tumor growth, actinomycosis and unknown causes (Table 2). Our definition of the face as the front part of the head which includes lips, cheeks, nose, eyes, forehead and one finger below lower border of the mandible. We excluded the fistulas and sinuses which occur in the neck or inside the mouth. On admission a complete history was collected from the patients

concerning name, age, gender, residency, the duration and the site of the sinus present. Clinical examinations of the patients is mandatory which include inspection, palpation and probing the sinus as well as radiographic examination which include conventional radiographical views like periapical, occlusal, panoramic views of the mandible and lower portions of maxilla and supplementary methods like sinography with stainless steel wire 0.5 mm in diameter or sinogram with injection of radiopaque dye (ipomer) through sinus tract.

We examined cutaneous tissue of the face to look for any skin lesion or dental lesion or malignant tumor. Also parotid region and submandibular with submental regions have examined to look for any salivary gland fistulas or dental lesion. Teeth are checked and recorded (deciduous and permanent), recorded whether sound healthy or carious teeth, also looking for any swelling intraorally. Also intraoral palpation of a cord-like structure connecting the skin lesion with the underlying alveolar ridge is helpful in establishing the diagnosis and according to the diagnosis, a treatment plan was contemplated, regarding a conservative line will be followed or a surgical intervention was indicated.

RESULTS

Fourteen patients have seventeen facial sinuses at submandibular region, four patients with four facial sinuses at submental region, eleven patients with eleven facial sinuses at cheek region, three patients with three facial sinuses at preauricular region and canthal regions for each, one patient with two labial sinuses, one patient with facial sinus at temporal region, parotid region, chin region, zygomatic region for each, (Table 3). Four patients having facial fistula (either orocutaneous or salivary fistula), thirty-four patients having facial sinus, two patients having facial fistula and sinus, and two patients have bilateral facial sinuses (Table 4).

Table 2: Causes of facial Fistulas and sinuses

Causes	%
Non-odontogenic infection	40.9%
Odontogenic infection	34%
Congenital	9%
Traumatic	6.8%
Tumor	4.5%
Actinomycosis	2.2%
Un known	2.2%

Table 3: Sites of facial fistulas and sinuses

Sites	Patients	Number of fistulas and sinuses	Percentage
Submandibular region	14	17	38.6%
Cheek region	11	11	25%
Submental region	4	4	9%
Preauricular region	3	3	6.8%
Canthal regions	3	3	6.8%
Temporal region	1	1	2.2%
Labial region	1	2	4.4%
Zygomatic region	1	1	2.2%
Chin region	1	1	2.2%
Parotid region	1	1	2.2%

Table 4: Number and percentage of patients with fistulas and sinuses

Type	Number of patients	Percentage
Facial fistula only	4	10%
Facial sinus only	34	85%
Facial fistula and sinus	2	5%
Facial sinus "bilaterally"	2	5%

The facial sinuses were more in males prevalent than in females (65% versus 35%) (Figure 1), and the (16-30) year's cohort made up the largest group (32.5%) (Figure 2).

Surgical interruption was adopted in 31 patients with 35 facial sinuses or fistulas (Figure 3). Six of the patients with facial sinus associated with a mandibular fracture infection.

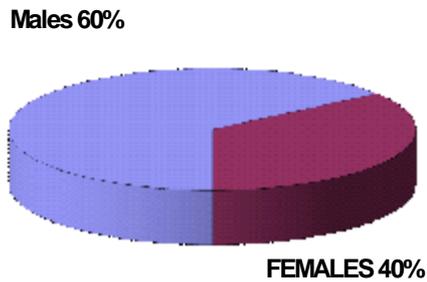


Figure 1: Sex distribution

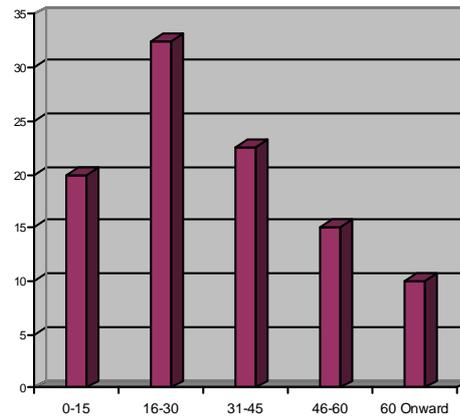


Figure 2: Age distribution

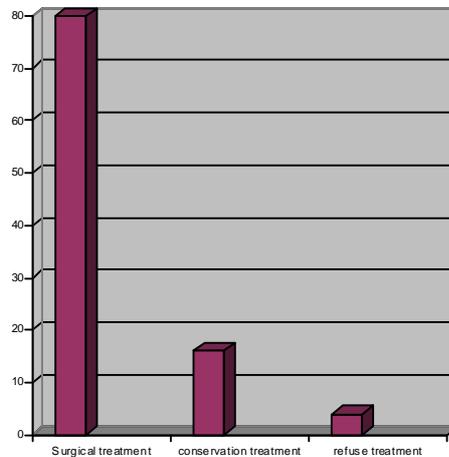


Figure 3: Mode of treatment

DISCUSSION

A chronic facial lesion is occasionally the skin manifestation of a fistula of dental abscess origin. It will persist until the abscess nidus is obliterated. The distance of the lesion from the oral cavity and the patient freedom from tooth discomfort do not exclude the dental cause.

This study showed that (32.5%) of the affected patients were in the age group (16-30) years old while (22.5%) were in the age group (31-45) years of age, (20%) were in the age group of (0-15) years of age, (15%) were in the age group (46-60) years of age and (10%) were in the age group 60 onward. Seventy-five percent of patients were under 45 years, this goes with Malik and Bailey series ⁽²⁾, perhaps because of shorter life expectancy. The predominant males to females ratio was supported by Mortenson et al. ⁽¹⁵⁾ and Malik and Bailey series ⁽²⁾ were more than 60% of patients were males and about 40% were females.

In this study Non-odontogenic infections was the most common cause and this include for example patients with facial sinuses due to infected bone graft. Also in this series TMJ arthritis cause a facial sinus in one of our patients who was uncontrolled diabetic patient and other patient presented with orocutaneous fistula at submandibular region after excision of squamous cell carcinoma of the tongue with pectoralis major flap for reconstructive due to infection with staphylococcus aureus and pseudomonas microorganisms. While in previous studies the distributions of cases based towards odontogenic origin and this is perhaps because many of patients may go to other departments or remain totally symptomless or the sinuses usually develop in connection with the developmental anomalies or because of presence of a deep seated infection or the presence of certain types of infection of the tract wall. Odontogenic infections

is a second of frequency in this study while in Malik and Bailey series ⁽²⁾ in two years period treated 100 consecutive cases of facial sinuses with a mean of 50 patients per year was the commonest cause of facial sinuses. One patient was diagnosed by general surgeon as a skin lesion so he treated three times by local excision of the sinus for one year duration while the diagnosis was infected keratocyst in the ramus of the mandible, other patient presented with a submandibular sinus for six months duration as skin lesion and the diagnosis was infected carious lower mandibular first molar tooth. A dental examination and radiographs recommended to rule out infection of dental origin ⁽¹⁶⁾. One patient presented with a facial sinus discharging pus at lateral canthal region of left eye due to osteomyelitis of the left maxilla. We reported four sinuses discharging in four patients due to infected maxillary teeth while Chernosky (1940) said maxillary sinuses discharging are rare and the gravity is accepted as the reason for the facility with which lower jaw abscess proceed to fistulization. So we think a cutaneous facial sinus tract of dental origin are often initially misdiagnosed and inappropriately treated. Correct diagnosis and treatment will result in predictable and rapid healing of these lesions. The third cause of facial sinuses was congenital cause, which result in four facial sinuses in three patients (9%) and these includes preauricular sinuses in two patients. The fourth cause of facial sinuses and fistulas was a traumatic cause. The fifth cause of facial sinuses was a tumor growth which result in two facial sinuses in two patients (4.5%) while this finding recorded in Malik and Bailey series a third cause. The sixth cause of facial sinuses was actinomycosis infection which results in one facial sinus (2.2%) and this goes with Malik and Bailey series who they considered this finding one of uncommon causes (Figure 4).



Figure 4: Patient with multiple sinuses due to actinomycosis infection.

The basic technique for management of facial fistula or sinus depends on the correct diagnosis which includes the awareness of the possibility of an odontogenic sinus by knowing that striking granulomatous lesion which may occurs about the gum, the face, and the neck and which may presents one end of a persistent sinus tract. The other end of this sinus usually originates in the apical abscess of a tooth but may take its origin in any osteomyelitis process of the jaw or foreign body infections. Out of the forty four facial fistulas and sinuses, four sinuses and three facial fistulas were treated conservatively, the treatment involve the detection of the cause which lead to

the sinus or fistula formation either infected tooth with periapical pathosis or salivary gland injury have been treated conservatively through dressing extraorally with iodoform packing intraorally. Surgical treatment was considered in thirty two facial sinuses and three facial fistulas. Fourteen sinuses due to odontogenic infection treated by extraction of the tooth and endodontic therapy of the tooth with curettage of the sinus tract with antibiotic or removal odontogenic cyst, four sinuses due to foreign body infection treated by removal of the bony sequestrum or the stainless steel wire (Figure 5).



A



B



C

Figure 5: A: patient with sinus discharge due to infected stainless steel wire for fixation of bone graft of right mandibular body reconstruction; B: radiograph shows infected stainless wire fixation; C: patient after the removal of the infected stainless steel wire and healed sinus discharge

Two sinuses due to infected mandibular fracture in some patients because of the presence of a tooth in the mandibular fracture lead to infected fracture and sinus formation treated by extraction of the tooth with curation of the socket of tooth, three sinuses and one orocutaneous fistula due to bone graft infection (autogenous outer table of iliac crest bone), four sinuses and one cutaneous fistula due to osteomyelitis of the

jaws, one sinus due to arthritis of TMJ who was a known case of IDDM result in a temporal abscess with a cutaneous sinus discharge we treated him by controlling the blood sugar level with drainage of temporal abscess, one patient with orocutaneous fistula postoperatively to excision of carcinoma of tongue treated by a free flap (Radial Chinese flap) (Figure 6) , two patients with four congenital sinuses an elliptical incisions were

made and sinus tract were dissected out together with direct closures while for the facial sinuses for actinomycosis infection treated by debridement with a heavy antibiotics.

The use of a negative pressure vacuum associated closure technique for orocutaneous fistulas was reported⁽¹⁷⁾.



A



B



C

Figure 6: Patient with orocutaneous fistula, A: Closure of orocutaneous fistula by forarm radial free flap (Chinese flap), B: intraorally, C: extraorally.

All patients except the patient treated for excision of a malignant tumor were operated upon under local anesthesia or conservatively. Two

patients refuse the treatment and one only one facial sinus unhealed. The majority of the patients kept on regular follow up for 2-3 weeks (Table 5).

Table 5: Treatment of 44 cases of facial sinuses

Treatment	No. of Cases	%
Endodontic treatment of lower anterior teeth.	1	2.25%
Treatment of osteomyelitis of jaws.	5	11.4%
Treatment of salivary gland injury fistulas.	3	7%
Extraction and antibiotic treatment of maxillary teeth.	8	18.3%
Extraction, antibiotic and excision of sinus tract treatment of mandibular teeth.	4	9.1%
Surgical extraction and curettage of infected non-erupted mandibular tooth.	1	2.25%
Tumor treatment of mandibular ameloblastoma.	2	4.5%
Enucleation of mandibular keratocyst cyst and antibiotic	1	2.25%
Removal of foreign body from the mandible, check and TMJ.	4	9.1%
Treatment of mandibular fractures infection.	2	4.5%
Treatment of mandibular bone graft infection.	4	9.1%
Treatment of TMJ arthritis in the temporal region.	1	2.25%
Treatment of orocutaneous fistula in submandibular region.	1	2.25%
Treatment of congenital sinuses in the lower lip and preauricular regions.	4	9.1%
Treatment of actinomycosis of submandibular region.	1	2.25%
Refuse treatment.	2	4.5%
Total	44	100%

REFERENCES

- Cantatore JL, Klein PA, Liebllich LM. Cutaneous dental sinus tract, a common misdiagnosis: a case report and review of the literature. *Cutis Nov* 2002; 70(5): 264-7
- Malik SA, Bailey BMW. Cervicofacial Sinuses. *British J Oral Maxillofac Surg* 1984; 22: 178-88.
- Endelman J. Cutaneous sinus tract of odontogenic origin. A misdiagnosed lesion. *Indian J Dental Sci* 2014; 1: 6.
- Abuabara A, Schramm CA, Zielak JC, Baratto-Fillo F. Dental infection simulating skin lesion. *An Bars Dermatol* 2012; 87(4): 619-21.
- Bonder L, Manor E, Joshua BZ, Barabas J, Szabo G. Cutaneous sinus tract of dental origin in children. *Pediatr Dermatol* 2012; 29(4): 421-5.
- Diagnosis and treatment of odontogenic cutaneous sinuses of endodontic origin and diagnosis of cutaneous facial fistulae of dental origin. *Oral Surg Oral Med Oral Pathol* 2011.
- Jeansonne BG. Periapical actinomycosis: a review. *Quintessence Int* 2005; 36(2):149-53.
- Rowe NL, Williams J. Maxillofacial injuries. 1985
- Cassio P, et al. Bisphosphonate-related osteonecrosis of jaws in patient with multiple myeloma. *Med Oral Pathol Oral Cir Bucal* 2008; 13(1): E52-7.
- Eklund MK. Bisphosphonate-related osteonecrosis of the jaws (BRONJ). *Southwest Oral Surgery and Implant Blog*; 2010.
- Tözüm TF, Seңçimen M, Ortakoglu K, Ozdemir A, Aydin OC, Keles M. Diagnosis and treatment of a large periapical implant lesion associated with adjacent natural tooth: a case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006; 101(6): e132-8.
- Wood NK, Goaz PW. Differential diagnosis of oral lesions. 3ed ed. 1985. p. 193-203.
- Topazian RG, Goldbery MH. Oral and maxillofacial infections. 3rd ed. W.B. Saunders Co.; 1994.
- Olasz L, Kawashie F, Nemth A. Closure of oropharyngocutaneous fistulae in an irradiated patient. *Int J Oral Maxillofac Surg* 1999; 28: 364-5.
- Mortencan H, Winther JE, Birn H. Periapical granulomas and cysts. An investigation of 1600 cases. *Scand J Dent Res* 1970; 78: 241.
- Sheehan DJ, Potter BJ, Davis LS. Cutaneous draining sinus tract of odontogenic origin: unusual presentation of a challenging diagnosis. *South Med J* 2005; 98(2): 250-2.
- Andrews BT, Smith RB. Orocutaneous and pharyngocutaneous fistulae. *Ann Oto/ Rhino/ Laryngol* 2008; 117(4): 298-302.

الخلاصة:

المقدمة: هناك فرق كبير بين معالجة الأفات الجلدية والنواسير سنية المنشأ وغير سنية المنشأ. نحن نهدف إلى تحليل عدد كبير من الأسباب متتالية من أجل الاشتباه السريري في التشخيص التفريقي يمكن المرحلة بشكل صحيح.

المواد والطرق: المواد من هذا البحث وتألقت من 40 مريضاً. يتم تحصيل التاريخ الكامل من المرضى الذين يعانون من مدة موقع النواسير الحاضر، تم فحص المريض لعوامل من الناسور والمتعلقات لها، وجود أي الأفات المصاحبة، والاستشارة الطبية القيام به لإبداء الرأي والإدارة. كان الفحص السريري للناسور والتجاويف الوجهية إلزامية لتجنب أي أخطاء قد تحدث. تم التفكير في وضع خطة العلاج فيما سيكون العلاج تحفظياً أو التداخل جراحياً.

النتائج: إن الأسباب العامة تتضمن: الأسباب الخلقية والمكتسبة. حيث خمسة عشر مريضاً يحتون على ثمانية عشر من النواسير و التجاويف الوجهية (40.9%)، بسبب العدوى غير سنية المنشأ، وكان خمسة عشر مريضاً يحتون على خمسة عشر النواسير الوجهية (34%) بسبب التهابات سنية المنشأ، وأربع نواسير الوجهية الخلقية (9%) وضعت في ثلاثة مرضى، والثنين من المرضى الذين يعانون من الثنين من النواسير الوجهية (4.5%) وذلك بسبب نمو الورم، ثلاثة مرضى مع ثلاثة التجاويف الوجهية (6.8%) نتيجة لأسباب الصدمة ومريض واحد مع ناسور وجهي واحد (2.2%) بسبب داء الشعيات والسبب غير معروف لكل واحد.

الاستنتاجات: يجب أن يكون جراح الوجه والفكين على علم بالاسباب سواء ان تكون تشوهات تنموية، أو التهابات العميقة الجذور، أو الاندمال بتشكيل النسيج الظهاري من الجهاز، أو الصرف غير كافية، و الاجسام الأجنبية العميقة وأنواع معينة من الالتهابات.