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Pitfalls in diagnosis: cutaneous sinus tract of dental origin - a case report

M. Ciantar*, J.E. Briffa**

ABSTRACT: Persistently draining cutaneous sinuses in the region of the head and neck may present to various specialties in medicine. The etiology of such lesions varies considerably and an accurate diagnosis is a pre-requisite to ensure immediate and effective treatment.
The most common etiologic factor responsible for intermittently suppurating cutaneous sinuses in the region of the head and neck is the extension of a chronic infection of odontogenic origin. The presence of a cervicofacial sinus should alert the medical and dental professions alike to the necessity of a thorough dental examination including radiographic assessment of teeth and jaws.
The following case report describes the clinical presentation, diagnosis and management of a recurrent (two year history) cervical sinus in a 10-year old boy.

* Department of Dental Surgery, University of Malta, St. Luke's Hospital, Gwaramangia.
** Department of Surgery, St. Luke's Hospital, Gwaramangia.

Correspondence: Dr M. Ciantar, Department of Dental Surgery, University of Malta, St. Luke's Hospital, Gwaramangia.

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Case Report

A 10-year old boy was referred by a dermatologist to the Dental Clinic, St. Luke's Hospital for assessment of a "chronic sinus possibly of dental origin".

The history revealed that the boy had originally complained of dental pain originating in the lower left mandibular quadrant some two years earlier. The pain subsided without treatment, so that the tooth was left unattended to. A few months after this painful episode, a swelling appeared in the left submandibular region. The lump progressively increased in size and eventually the overlying skin broke down discharging a considerable amount of pus. At the time the patient was febrile. He was treated with topical and systemic antibiotics after which all local systemic symptoms subsided and the area appeared to heal. The abscess recurred within a few weeks and this time it was incised extra-orally and treated again with topical and systemic antibiotics. Resolution of the abscess was apparent initially but the extra-orally spontaneously discharging sinus kept reappearing on a number of occasions thereafter. The patient was first seen by a dermatologist about a year after the first appearance of the sinus. A three month course of antibiotic therapy was prescribed yet the lesion failed to resolve completely. The boy was eventually referred to the Dental Clinic for an oral assessment.

Extra-oral examination disclosed an elliptically-shaped purplish area of discolouration just inferior to the left lower border of the mandible (Figure 1). The beginning of cutaneous suppuration was evident at the centre. A scab was present just off-centre showing the previous site of drainage. The lesion measured 4 cm

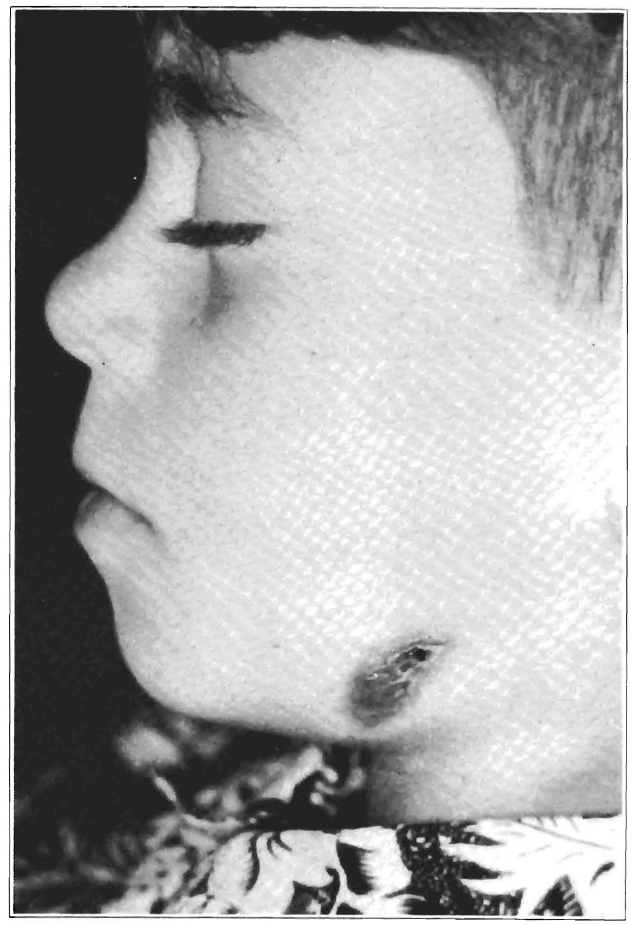

Fig. 1 - Chronically recurrent cervical sinus on presentation in a 10 year old boy (April 1995)

anteroposteriorly and 2 cm vertically (Figure 2). On palpation the area was tender, indurated and fixed to underlying structures (bone). Submandibular lymphadenopathy was elicited on the same side.

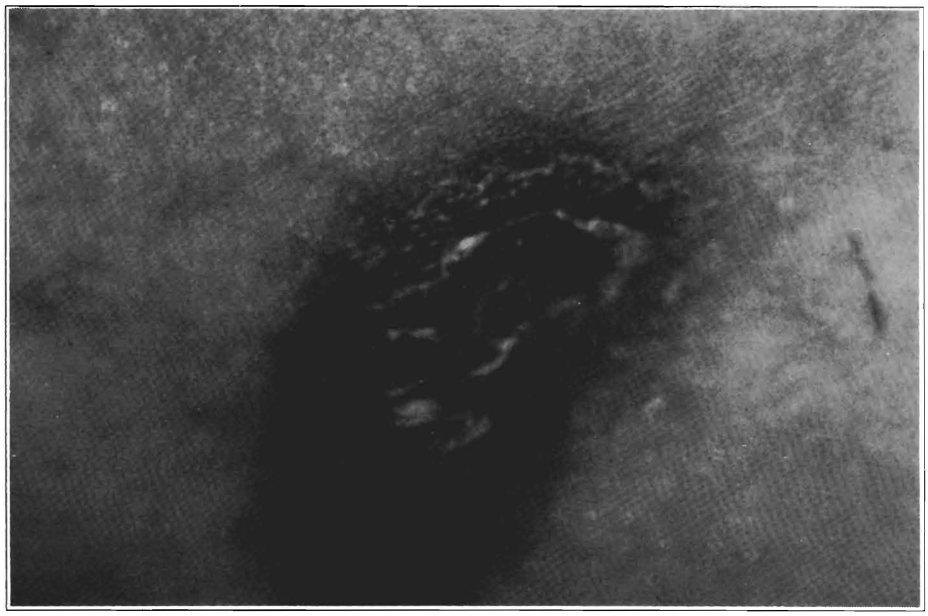

Fig. 2 - A closer view of the sinus shows scab formation at a previous site of drainage and a point of discharge developing centrally

Intra-oral inspection revealed a generalised state of oral neglect with poor oral hygiene and several carious teeth. The lower left first molar was extensively decayed. Close examination of the orthopantomograph (OPG) showed that all first molars were extensively decayed and a radiolucent canal extended from the distal root of the lower left first molar to the inferior border of the mandible (Figure 3). This confirmed the diagnosis that the origin of the cutaneous tract was the necrotic dental pulp of this tooth. The tooth was extracted under local anaesthesia. Healing of the sinus occurred within ten days.

Fig. 3 - An orthopantomographic view showing not only the developing dentition but also the extensive decay of all four first molars

The patient was reviewed six months later. The sinus and extraction socket had healed completely. An area of pigmentation and dimpling at the previous abscess site was still visible and the skin was fixed to underlying bone (Figure 4). The patient was referred to a Plastic Surgeon for surgical correction of the area.

The area of post-inflammatory hyperpigmentation was too extensive to allow excision and direct closure. However, it was considered feasible to attempt scar revision in order to correct tethering to the underlying bone which was producing a noticeable contour deformity. This procedure was performed under a general anaesthetic. The scar along the left mandibular border was excised and the surrounding skin undermined to allow mobility. Closure of the wound was then carried out incorporating a Z-plasty in the centre. This was done in order to prevent a scar contracture from developing as well as to correct the contour defect by bringing small transposition flaps of normal tissue into the area of previous scar tethering.

The patient made a good post-operative recovery with no complications. At the present time, the left mandibular contour defect has been corrected and the only problem is mild hypertrophy of the surgical scar which is resolving without treatment. A small residual area of hyperpigmentation at the anterior end of the scar will be dealt with as a second stage procedure in the future once the surgical scar has matured.

Discussion

Chronically discharging sinuses of the skin of the face and neck frequently may present a diagnostic problem. Such persistent lesions arise from failure to recognise and remove the underlying cause. By definition a sinus is an abnormal channel or fistula permitting escape of pus [1]. The sinus may drain close to the site of infection; alternatively the pus may track through tissue spaces giving rise to a cellulitis and may drain at a distant site.

The most common etiologic factor giving rise to cutaneous lesions in the head and neck region yielding intermittent purulent drainage is the extension of a chronic odontogenic infection [2,3]. The primary site of infection

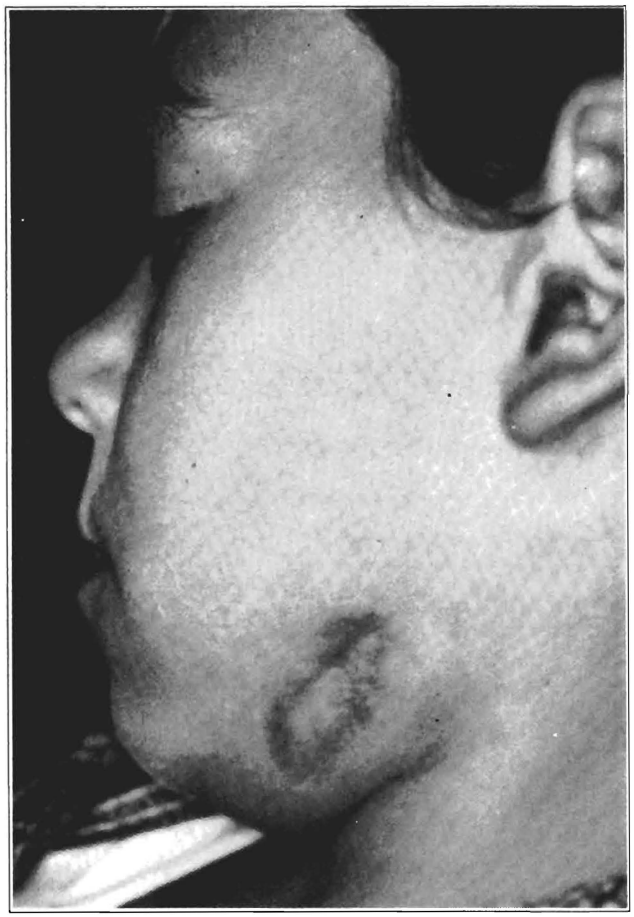

Fig. 4 - Six months post-extraction (Dec 1995): the sinus healed completely but the area remained dimpled and pigmented

originates from a necrotic dental pulp, eg due to dental caries or trauma. This in turn gives rise to a chronic alveolar abscess, defined as a long standing low-grade infection of the peri-radicular alveolar bone. The abscessed pulp may discharge into the oral cavity through the carious lesion; alternatively the infection spreads through the root canals and beyond the root apices into the periradicular tissues. Further spread of infection occurs in a relatively concentric manner. It may reach and break through the cortical plate of maxillary or mandibular bone. Beyond the periosteum further spread within the extra-osseous tissues follows the course of least resistance. The length of the root of the tooth and its relationship to the length of the alveolar process is an important factor in determining whether such a bony breakthrough will occur proximally or beyond the critical line of muscle attachments. If the root apex of the involved tooth lies on the inside of the buccinator attachment the sinus will drain intra-orally. Conversely, if it lies outside the C-shaped attachment, the infection will spread through the tissue spaces and may drain through the skin [4,5]. In the child or adolescent, the alveolar process is not fully developed and the teeth are more deeply embedded as they are not fully erupted. Also the caries rate is higher which explains why these lesions are commoner in this younger age category [2]. Malik et al [3] observed that from 100 consecutive cases of cervicofacial sinuses, 48% had occurred between the ages of 16-30 years.

The cutaneous lesions associated with such low-grade infections are seldom accompanied by symptoms referable to the oral cavity, frequently resulting in delayed diagnosis and management. A history of toothache is present in only 50% of cases [6]. The majority of dental sinus tracts (80%) arise in the mandible and hence appear in the submandibular or submental area, the latter being the commoner site [7,8]. If the infection arises from a maxillary tooth, pus will drain through the cheek or paranasal sinuses [2].

Diagnosis of dental pathosis is straightforward if the sinus is juxtaposed to a carious tooth. However, this may not always be the case. The dental origin may be obscured as the teeth may be well restored. Hence the pulporadicular infection can be diagnosed only after radiographic examinatiton [9]. Clinically these lesions may simulate other dermatologic conditions such as embryologic fistulas (eg branchial fistulas), carcinomatous lesions etc, with the consequent result that they are treated as such. Since the etiologic factor, ie the necrotic dental pulp, is overlooked and hence left untreated, the discharging sinus keeps reappearing.

A review of the literature reveals that patients presenting with these lesions may receive multiple surgical procedures and courses of antibiotics prior to the recognition of intra-oral disease [2,3,10]. The majority of patients are referred for dental treatment only after medical treatment [3]. A thorough intra-oral examination accompanied by radiographs proves crucial for a proper diagnosis. A useful physical sign is a fibrous tract palpable by the examining finger in the buccal sulcus extending from the apex of the involved tooth to the skin. Where multiple carious teeth are present a sinogram (ie a radio-opaque material, usually gutta percha, is passed through the sinus tract and a radiograph taken) will be of value in showing the tract communicating directly with the periapical infection. Any tooth which is carious, restored or has sustained trauma must be suspect. Extraction of root canal therapy is the definitive treatment that leads to involution of the sinus tract. Unless the offending agent is removed, local treatment is ineffective [11].

Histology

The predominant cell type is similar to that of any other chronic infection with polymorphonuclear leukocytes centrally located within the lesion and numerous lymphocytes and plasma cells towards the periphery. The sinus tract is usually lined by granulation tissue and will heal by granulation in about 15 days after elimination of infection [11]. In the majority of cases the cosmetic result is quite satisfactory. In a few pigmentation and/or umbilication and dimpling of the skin may require surgical intervention.

Conclusions

- The commonest cause of a facial or cervical sinus with intermittent purulent drainage is a necrotic dental pulp.
- The extra-oral manifestation of pulporadicular pathosis, whilst not rare, is easily mis-diagnosed by physicians and dental surgeons.

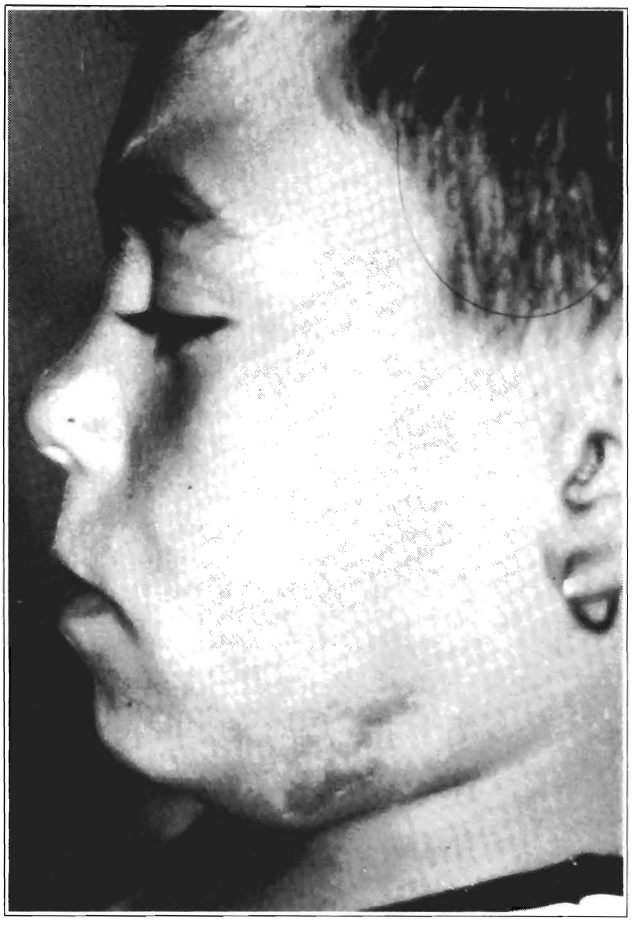

Fig. 5 - Six months post-surgery (June 1996): the skin no longer dimpled and the area of pigmentation considerably reduced.

- Any chronic suppurative lesion on the middle or lower portion of the face should be investigated for a possible dental cause [12].

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