

However, the malignant change of melanocytes in SN could conceivably occur by one of two different mechanisms: it is possible that this change occurs spontaneously in melanocytes in SN; alternatively the change may occur under the induction of SN. The mechanism by which this abnormal induction occurs is not known. Ackerman suggests that most malignant melanoma in situ develop de novo, but many surely develop in preexisting melanocytic nevi.<sup>10</sup> Considering his suggestion, we speculate that malignant change of melanocytes occurs within melanocytes of SN without induction of SN.

On the basis of our own experience and reviews of the literature, it must be stressed that local excision should be carried out early in the patient's life, preferable before puberty, while the lesions are small in size and the likelihood of malignant degeneration is small.<sup>11</sup> Moreover, early removal of the lesion reduces the likelihood of cosmetic problems for the patient.

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## Midline odontogenic infections: a continuing diagnostic problem

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**SUMMARY.** Cutaneous sinus tracts and facial swellings of odontogenic origin have been well documented in the literature. These lesions however continue to be incorrectly diagnosed resulting in inadequate and unnecessary treatment. This paper reports two cases of midline odontogenic infections presenting as skin lesions. Neither patient complained of dental problems, and intraoral examination failed to reveal pathology. Both had been treated over an 18-month period, undergoing multiple surgical procedures before the correct diagnosis was made. Lesions on the face can be the result of occult chronic odontogenic infection. Awareness of a possible dental cause, especially with facial lesions that recur after excision is essential. The use of vitality testing of the teeth and appropriate radiographs ensures the correct diagnosis should not be missed. © 2003 Published by Elsevier Science Ltd on behalf of The British Association of Plastic Surgeons

**Keywords:** dental sinus, odontogenic infections, facial sinus.

## Introduction

The presentation of odontogenic cutaneous sinus tracts on the face masquerading as a variety of pathologies has been frequently reported in the literature.<sup>1-4</sup> Patients may present to a number of specialties including Plastic Surgery, Dermatology, General, ENT, Maxillofacial and Accident and Emergency departments and to their own General Dental or Medical practitioner. A review of the literature reveals that many patients have undergone multiple surgical excisions, radiotherapy, antibiotics, and some have received cancer therapy before obtaining a histological diagnosis.<sup>5</sup> The differential diagnosis of facial lesions may include sebaceous cysts, pyogenic granulomas,<sup>6</sup> basal<sup>7</sup> and squamous cell carcinomas,<sup>8</sup> melanoma, infections such as Actinomycosis<sup>6</sup> and Tuberculosis<sup>9</sup> epitheliomas, dermoid, branchial and thyroglossal cysts.<sup>10</sup> Tooth involvement with infection is often asymptomatic and is therefore not obvious to either patient or clinician. Surgical excision of the lesion alone without appropriate treatment of the infective cause leads to inevitable recurrence.

The two case histories presented demonstrate how cutaneous lesions are misdiagnosed. Unless the possibility is considered in the differential diagnosis, patients will continue to be inappropriately treated.

## Case 1

A 55-year-old caucasian woman was referred from a Dermatology department for excision of a lesion on her philtrum (Fig. 1). This had previously been treated twice by the application of silver nitrate cautery and subsequently diathermy. The lesion recurred. The mass was pedunculated, approximately 4 mm in diameter and vascular in appearance. A clinical diagnosis of a pyogenic granuloma was made. Dental examination revealed the upper central incisor tooth was crowned but was asymptomatic. It was not tender to percussion and there were no intra oral sinuses present. The lesion was curetted and the histology reported as chronic inflammatory tissue consistent with a pyogenic granuloma. Initially the wound healed well but the lesion again recurred at three months. A more extensive excision extending down to



Figure 1—Lesion on upper lip.

the periosteum was performed. Again the histology was reported as chronic inflammation only. Two months later the lesion reappeared. Only at this stage was a periapical radiograph of the upper incisor teeth taken revealing a radiolucent area associated with the asymptomatic crowned upper right central incisor (Fig. 2). The tooth was root-filled by the patient's dentist and the lesion resolved completely without any further surgery.

## Case 2

A 23-year-old caucasian male was admitted for incision and drainage of a submental abscess. He was systemically unwell, with a temperature of 39.5 °C and presented with a firm erythematous hot tender submental swelling.

His history included two previous admissions under General Surgery and ENT, 18 and 8 months previously for incision and drainage of a similar abscess.

Clinically examination revealed a good dentition with no caries or periodontal disease although considerable wear on his teeth was noted together with a history of bruxism. The abscess was incised and drained under a general anaesthetic. An appointment was made for an MRI of the area. However at the two-week post-operative review a soft 1.5-cm swelling was still present submentally (Fig. 3).

Only at this stage was vitality testing of the lower anterior teeth performed suggesting the lower right central was non-vital. Radiographs confirmed a periapical area was present. The tooth was root-filled and the swelling resolved.

## Discussion

The differential diagnoses of swellings and sinuses on the face are numerous. However the possibility of a dental cause should also be considered even when



Figure 2—Radiograph illustrating a radiolucent area associated with the non-vital upper right central crowned incisor.



Figure 3—Submental lesion.

examination of the mouth has shown no obvious odontogenic pathology. Although overt decay and trauma is usually apparent from clinical dental examination, and is usually associated with pain, other causes include chronic trauma from bruxing, or chemical and thermal injury, infections from roots and cysts.<sup>11</sup> Inflammatory degeneration of the pulp, periodontal membrane or dental follicle may slowly track through the cancellous bone following the path of least resistance and perforates the cortical plate to present either intra, or extra-orally. Once pus has entered the soft tissue its direction of spread is limited by muscles and fascial planes which tend to direct the pus towards certain defined areas where it accumulates. The muscles which commonly play a useful part in containing an infection around the maxilla and mandible are mylohyoid, buccinator,

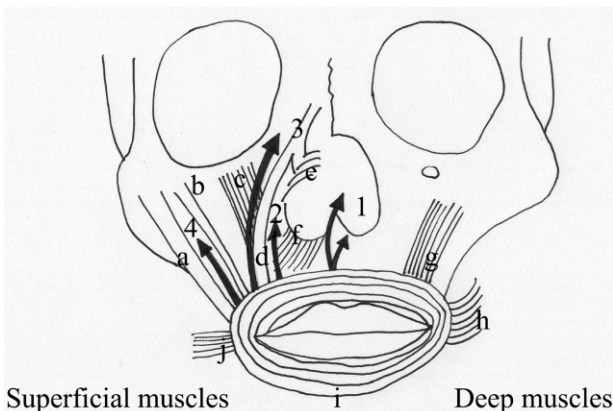


Figure 4—Extraoral sites for odontogenic sinuses in the Maxilla. Legends: (a) Zygomaticus major (b) Zygomaticus minor (c) Levator Labii superioris arising from the infra-orbital foramen (d) Levator Labii superioris alaque nasi (e) Compressor nares (f) Dilator nares (g) Levator anguli oris and (h) Risorius.

- (1) Odontogenic sinuses tracking from the upper incisors or occasionally the lateral incisor may present in the floor of the nose or philtrum directed by dilator nares muscles.
- (2) A sinus may present in the lateral nasal region from infections tracking from the canine or occasionally the lateral incisor.
- (3) Infections tracking to the medial aspect of the eye (the danger area) usually from apical infection of the canine or first molar.
- (4) Odontogenic sinuses from the upper molars may rarely present on the cheek if their apices are above buccinator.

masseter, medial pterygoid and the superior constrictors (Fig. 4). If the apices of the teeth are above the maxillary muscle attachments and below the mandibular muscle attachments the spread of infection may be extra-oral. Only 50% of patients with cutaneous odontogenic tracts have a history of toothache.<sup>12,14</sup>

Reviews of the literature reveal dento-cutaneous sinuses present most frequently over the mandible<sup>4</sup> and the maxilla but less commonly may appear over the chest, neck, medial canthus or at distant sites.<sup>4,12,13</sup>

The importance of considering an odontogenic source is essential even when clinical examination of the mouth fails to suggest dental pathology. Vitality testing of teeth in conjunction with dental radiographs such as Orthopantomograms and periapicals are essential. In cases where the diagnosis is uncertain the lesion should be probed for a sinus. Radiographs taken with the probe in the sinus tract will confirm the origin of the infection.

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