

Carcinoma Cuniculatum Presenting as a Gingival Lesion

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This report describes a case of carcinoma cuniculatum that presented initially as keratosis and ulceration of the gingiva when the patient attended for extraction of a persistently painful tooth in the right mandible.

A series of mucosal biopsies and subsequent reviews showed hyperkeratosis associated with chronic candidosis and mild dysplasia but no evidence of neoplasia. However, vague symptoms of pain persisted in the mandible over a six-year period when the clinical signs were then consistent with osteomyelitis.

A later biopsy included bone and indicated a diagnosis of carcinoma cuniculatum, a tumour that only rarely presents in the mouth. This necessitated radical excision of bone and grafting.

Gingival lesions that initially appear innocuous may have the potential for malignant change. Biopsies of what might appear to be pre-malignant lesions usually ensure that invasive pathology is detected early. In this instance, however, the nature of the lesion meant that the carcinoma cuniculatum was only diagnosed following the more radical biopsy of bone.

Key words: carcinoma, papillary, verrucous, mandibular neoplasia

INTRODUCTION

Carcinoma cuniculatum is a rare variant of squamous cell carcinoma, which may present as a verrucous or papillomatous, keratinized lesion that may become ulcerated. The aetiology is not known. The name cuniculatum derives from the appearance of the network of epithelial strands that resembles a rabbit warren (Latin: *cuniculatum*). The tumour was first described in the foot (Aird et al, 1954), although cases have also been described involving the hand (Coldiron et al, 1986; Collinson and Mikhail, 1989; Neilson et al, 1988), buttock (Melo and Melo, 1989), nasal cavity (Szmeja et al, 1996), face and oral cavity (Kahn et al, 1991; Odell and Morgan, 1998). The lesion is a slow-growing, ulcerated proliferation that invades in a burrowing pattern into the

surrounding tissues although metastases to regional lymph nodes are rare. Chronic suppuration, local abscess formation and sequestration are common when the tumour invades bone and a diagnostically challenging lesion may be mistaken for osteomyelitis. Treatment is by radical surgical excision. In this report, we describe a case of carcinoma cuniculatum that presented initially as a gingival lesion.

CASE DESCRIPTION AND RESULTS

Dental history

A 44-year-old woman was referred initially by her general dental practitioner to an oral and maxillofacial surgery department at a regional hospital with an ulcer (1.0 x 0.5cm) on the lingual aspect



Fig 1a–b Gingival keratosis associated with 42, 43, and 44 at presentation. Biopsy revealed hyperorthokeratosis with chronic inflammation and secondary candidal infection. There was no evidence of invasive growth.

- a) Labial view
b) Lingual view.

of the edentulous ridge in the lower right quadrant. There had been some swelling in the region accompanied by a constant, dull pain, and the general practitioner had extracted 45 and 47. The sockets had healed uneventfully. No lymph node involvement was noted. Biopsy of the lesion showed an area of hyperorthokeratosis and a small sequestrum of bone, which was considered to be a remnant following the recent extractions. In view of the hyperkeratotic mucosa, it was decided to keep the patient under review. The ulcerated site healed very slowly over the following five months. A further biopsy showed no atypia, and the appearance was consistent with chronic inflammation around a healing wound. There was no evidence of neoplasia. The slow-healing of the ulcer was possibly exacerbated by local trauma and the patient's long-term steroid therapy. After a further five months there remained a small area of keratosis on the edentulous ridge, but this was now symptomless and the patient failed to attend a number of follow-up appointments. She presented again one year later when the original area of keratosis was still present and there was an additional region of keratosis associated with gingival inflammation in the lower right quadrant. These observations prompted a referral to a periodontal department.

Medical history

The patient suffered from myasthenia gravis for which she was prescribed prednisolone 5mg bd.

Other medication included ranitidine 150mg bd for a duodenal ulcer and a short-acting benzodiazepine as a hypnotic. Five years previously, the patient had been hospitalised for thymectomy, and 13 years previously for surgical management of abdominal adhesions. She smoked 15-20 cigarettes a day and only rarely drank alcohol.

Further observations

When the patient attended for a periodontal opinion, examination confirmed areas of keratosis on the edentulous ridge distal to 44 as well as on the labial and lingual free and attached gingiva adjacent to 42, 43, 44 (Fig 1a). The gingiva also demonstrated mild inflammatory change consistent with inadequate plaque control. The lingual interdental papilla between 43, 44 was 'flattened' in appearance, possibly consistent with a necrotising ulcerative gingivitis (Fig 1b). Periapical radiographs showed a vertical bone defect and some 'cratering' associated particularly with 44 (Fig 2). A biopsy of the gingival lesion confirmed hyperkeratosis, chronic inflammation and a secondary candidal infection. A course of hygiene-phase therapy commenced and the patient was advised to stop smoking.

At two-month follow-up the patient complained of 'soreness and some swelling in the lower right area of the mouth'. The lingual gingival keratosis was somewhat more extensive and there was ulceration of the lingual gingiva and adjacent floor of mouth in the 42, 43, 44 region. The patient al-



Fig 2 Periapical radiograph showing vertical bone loss with crater defects associated with 42, 43, and 44. This film was taken when the patient first attended the department.

so complained of a throbbing pain from 48 (grade II mobile), and the tooth was extracted under local anaesthesia. An incision biopsy of the ulcerated lesion was taken at the same time. The pain resolved completely after the extraction and the biopsy showed an area of hyperkeratosis and chronic inflammation. There was no evidence of neoplasia. In view of the unpredictable nature of the patient's symptoms and the persistence of the white lesions the patient was kept under regular review.

Six months later the patient was complaining of 'pain and soreness' of the lower gingiva that was considerably worse than before. Clinical examination revealed that the ulcerated lesion had reappeared and that 42 was grade II mobile. Radiographic examination showed an irregular alveolar ridge. At this time the patient was undergoing a maintenance programme with the hy-

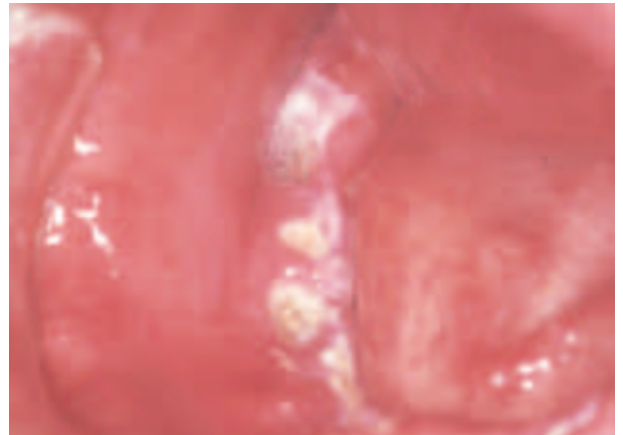


Fig 3 Multiple ulcerative lesions on the right mandibular alveolar ridge with a sequestrum of bone clearly identifiable. At this stage, the clinical and radiographic observations were typical of osteomyelitis.

gienist. Arrangements were made for 42 to be extracted (at the patient's request) and a repeat biopsy of the ulcerated gingiva. This biopsy showed features similar to those seen previously with no evidence of neoplasia. The pain and soreness resolved and further follow-up was arranged.

When the patient next attended three months later she was complaining of more severe pain along the right side of the mandible at the lower border extending into the right side of the neck. The alveolar ridge was 'irregular' and the mucosa had a speckled appearance. A more extensive excision of the mucosa was undertaken and histology showed hyperkeratosis with mild dysplasia, probably associated with features of secondary infection with candida. Healing of the surgical site was protracted and the patient continued to suffer discomfort. This subsequently became 'continuous' and like 'toothache' and a panoramic radiograph showed a 'moth-eaten' appearance of the right alveolar ridge. An area of exposed bone was detected on the right alveolar ridge, and a diagnosis of osteomyelitis was made (Fig 3). This was treated in the first instance with hyperbaric oxygen and antimicrobials. At the three-month review, however, the symptoms reappeared, so the patient was admitted for local excision of the affected right mandibular alveolus. At operation, 'abnormal' soft tissue, necrotic bone and suppuration were identified, and these were consistent with the previous clinical diagnosis of osteomyelitis. These features were confirmed histologically but the se-

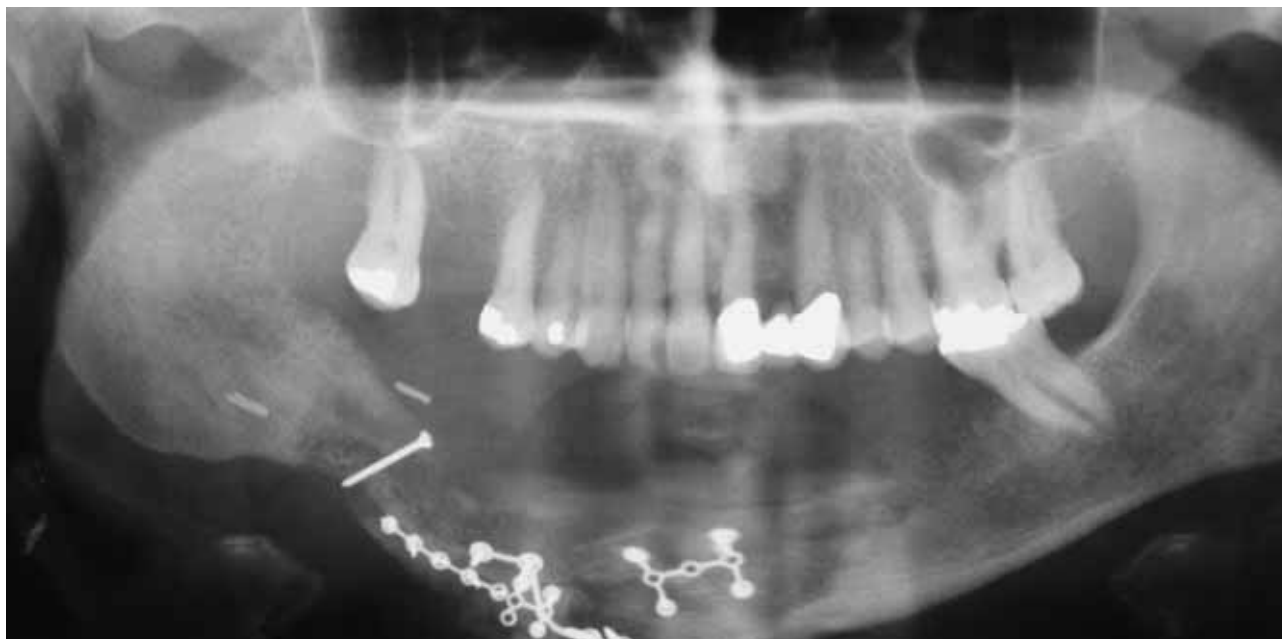


Fig 4 Ultimately, gross destruction of the mandible occurred as the lesion progressed. Radical excision was carried out and the defect repaired using a radial forearm flap.

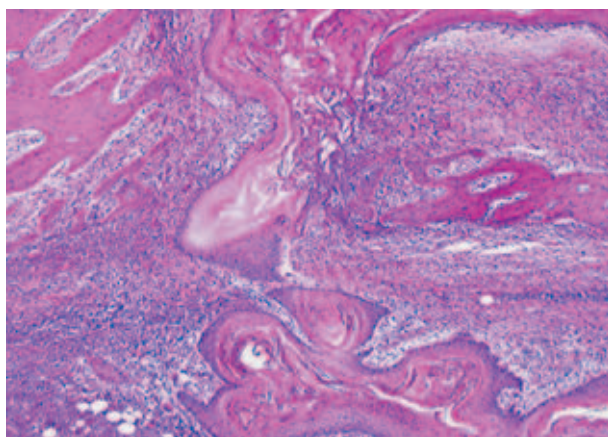


Fig 5 Histopathology of carcinoma cuniculatum. The keratinizing, invasive squamous epithelium is well differentiated. The tumour has destroyed small islands of bone that are being extruded as sequestra. (The characteristic complex, branching pattern of epithelial invasion lends its name to the lesion [cuniculus - rabbit warren]).

sequestra were associated with abnormally proliferating, mildly atypical squamous epithelium suggesting a well-differentiated, squamous cell carcinoma resembling carcinoma cuniculatum. Over the following year, the patient suffered recurrent infection at the operation site, and a further biopsy showed features similar to those seen previously, consistent with recurrent carcinoma cuniculatum.

The patient subsequently underwent a subtotal mandibulectomy and right suprahyoid neck dissection repaired using a radial forearm flap (Fig 4). Histological examination of the resection specimen confirmed carcinoma cuniculatum (Fig 5).

DISCUSSION

Carcinoma cuniculatum of the oral cavity, first described in 1954 (Burkhardt, 1954), is an extremely rare lesion. A recent review of the literature (Allon et al, 2002) described one case and found only 13 additional cases that affected the oral cavity. Odell and Morgan, however, have also referred to an unpublished series of a further 15 cases (Odell and Morgan, 1998).

In our case, the initial lesion was a white patch on the mandibular gingiva, extending onto the alveolar ridge. The clinical diagnosis of osteomyelitis was based upon characteristic symptoms and appearances of chronic infection with severe and protracted pain, a purulent exudate and ultimately exposed bony sequestra. At this stage, however, the lesion was completely resistant to conventional treatment for osteomyelitis and histopathological examination revealed carcinoma cuniculatum leading to wide surgical resection of the mandible.

The patient's history and the clinical features and behaviour of the carcinoma were typical of the few lesions that have already been described in the literature (Allon et al, 2002):

- Age of onset around 50 years of age;
- Presentation in the form of a mucosal or gingival lesion;
- Smoking as a potential causative factor;
- Unusual features and slow growth that may complicate diagnosis (the longest period between presentation and diagnosis being 22 years);
- Destruction of local anatomical structures;
- Radiographic features indicative of an infectious rather than neoplastic condition;
- The inevitable need for surgical resection of the lesion.

It was not possible to conclude with absolute certainty that the lesion in bone originated from the gingival keratosis that presented as the initial lesion. None of the soft tissue biopsies indicated neoplasia, and the histopathology that led to the diagnosis was based on a specimen that was resected from within the body of the mandible. The appearance of the presenting gingival lesion adjacent to 42 was, however, described as unusual and aggressive (Fig 1b), and the localised pattern of bone resorption from around this tooth (Fig 2) suggested possible pathology other than chronic periodontitis. If the burrowing lesion did indeed originate from the gingival lesion then we would need to speculate as to whether the tumour arose *de novo* or whether it developed as a continuum of the gingival keratosis, candidal infection or periodontal inflammation.

Although we have not been able to undertake regular follow-up of this case, the long-term prognosis must be considered very favourable, as no cases of recurrence following resection of an oral lesion have been described (Allon et al, 2002).

We appreciate fully that very few clinicians are ever likely to see a case of carcinoma cuniculatum. Nevertheless, this case serves as a reminder, to periodontists in particular, that some gingival lesions that initially appear innocuous may have the potential for malignant change. Careful monitor-

ing and biopsies of what might appear to be pre-malignant lesions usually ensure that invasive pathology is detected early.

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