

Inflammatory pseudotumour of the mouth and maxilla

A W H Shek, P C Wu, N Samman

Abstract

Aim—To describe the clinicopathological and immunophenotypical findings of two cases of inflammatory pseudotumour in the oral cavity.

Methods and Results—The patients presented with a short history of swelling in the cheek and the maxilla respectively. Magnetic resonance imaging or computerised tomography scan showed space occupying lesions with infiltrative margins which were interpreted as aggressive malignant neoplasms. Histological examination showed fascicles of spindle cells in a background of chronic reactive inflammatory cells including plasma cells, typical of inflammatory pseudotumour. The spindle cells were positive for vimentin, smooth muscle actin and CD68, but were negative for follicular dendritic cell markers. The lymphocytes showed no light chain restriction.

Conclusions—Inflammatory pseudotumour in the oral cavity is completely benign and simple excision is curative. However, it may be confused with a malignant tumour on clinical and radiographic grounds, and histologically the appearances can also be misinterpreted as those of a more aggressive lesion. Its correct recognition by the surgical pathologist is important to avoid unnecessarily radical and potentially mutilating surgery.

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Inflammatory pseudotumour is a tumour-like lesion characterised histologically by fascicles of plump spindle cells in a background of chronic inflammatory cells, notably plasma cells. Other synonyms have been used to describe similar lesions, such as plasma cell granuloma, histiocytoma, xanthomatous granuloma, inflammatory myofibroblastictumour, and spindle cell pseudotumour.

Inflammatory pseudotumour occurs in a wide variety of somatic tissue and visceral organs, including the lung,¹ liver,² thyroid,³ and many other organs. Recently it has been described in the major salivary glands⁴ and the buccal tissue in children.⁵ We describe here the clinical, radiological, histological, and immunophenotypical findings of two examples of inflammatory pseudotumour in the oral cavity in adults.

Case reports

CASE 1

A 20 year old man was referred for a swelling over the right cheek. This had been present for one month and did not respond to antibiotic treatment. Physical examination revealed a diffuse swelling over the right cheek. Intra-orally, there was a firm exophytic mass of 2 cm diameter in the right cheek opposite the molar region. The overlying mucosa was ulcerated, but there was no discharge. Magnetic resonance imaging (MRI) revealed an infiltrative lesion invading skin and parotid duct (fig 1). The impression was that of an aggressive neoplasm.

Fine needle aspiration was performed and smears showed non-specific chronic inflammation with epithelioid-like cells present (fig 2). Special stains for micro-organisms, including mycobacteria and fungi, were negative. Excisional biopsy was advised.

The lesion was completely excised and histological examination showed fascicles of elongated spindle cells in a mixed inflammatory background with a predominance of plasma cells (fig 3). Special stains for micro-organisms, including mycobacteria and fungi, were negative. The majority of the spindle cells were positive for CD68 (Dako) and vimentin (Dako), while a smaller number were positive for smooth muscle actin (BioGenex), but they were negative for S-100 (Dako), MAK-6 (Ciba), CD21 (Dako), Ber-MAC-DRC (Dako), and Ki-M4 (table 1). The lympho-

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Figure 1 MRI appearance of the firm indurated mass (arrow) anterior to the right masseter muscle, infiltrating skin but not involving bone.

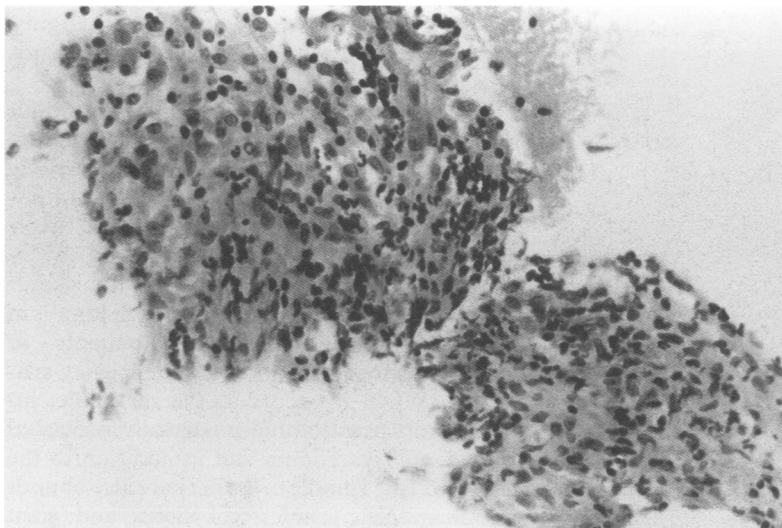


Figure 2 Clusters of mixed chronic inflammatory cells composed of histiocytes, lymphocytes, plasma cells, and some epithelioid cells ($\times 35$).

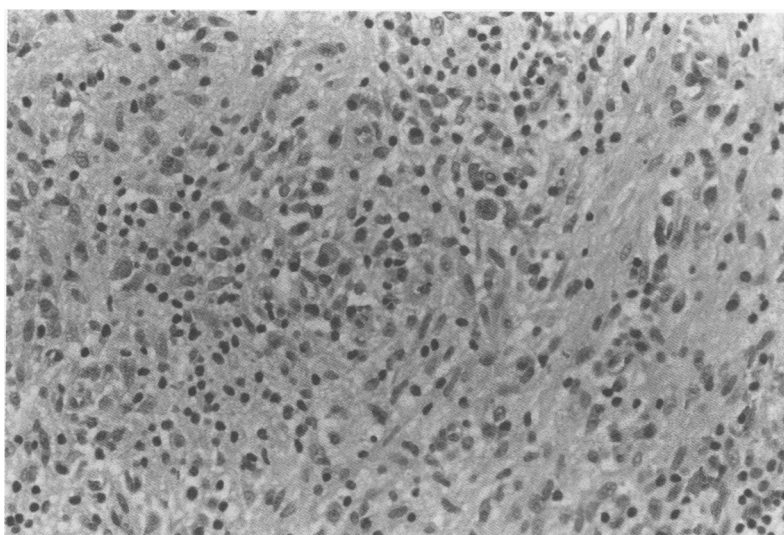


Figure 3 Short, swirling fascicles of spindle cells admixed with plasma cells and lymphocytes ($\times 114$).

cytes and plasma cells showed no light chain restriction.

The patient was well at 13 months follow up with no recurrence of tumour.

CASE 2

A 36 year old woman was referred for management of a painless, gradually enlarging swelling in the left maxilla for the past year. Physical examination revealed a small palpable swelling in the left infraorbital region with nor-



Figure 4 CT appearance of cystic lesion within the left maxillary sinus, with erosion of the anterior wall of the maxilla (arrow).

mal overlying skin. The eye movements were normal. No epiphora or nasal discharge was noted.

Intraorally, a diffuse swelling in the left upper buccal sulcus was present, extending from the midline to the maxillary tuberosity. The covering mucosa was normal. The second premolar was tender to percussion but both premolars and the first molar on the left side were negative to electric pulp testing. Plain radiographs showed a loculated cystic lesion in proximity to the left maxillary teeth and extending into the left maxillary sinus. There was no root resorption. Computed tomography (CT) scan showed a cystic lesion occupying a large part of the maxillary sinus with evidence of erosion of the anterior wall of the sinus in the infraorbital region (fig 4). It was interpreted as an aggressive neoplasm.

Open biopsy through an intraoral sulcus incision revealed a cystic cavity containing straw coloured fluid with an irregular yellowish firm mass at its wall on the cheek. Histological examination showed fibroblastic spindle cells admixed with abundant chronic inflammatory cells and focally the stroma was loose and myxoid, closely resembling that of nodular fasciitis (fig 5). The lesion was entirely resected. Microscopic examination showed fascicles of plump spindle cells with abundant plasma cells and lymphocytes in the background, identical with that of case 1. Areas resembling nodular fasciitis found in the previous biopsy specimen

Table 1 Immunohistochemical profiles of the spindle cells in the two cases of inflammatory pseudotumour

Antibody	Source	Major reactivity	Results	
Smooth muscle actin	BioGenex (San Ramon, CA, USA)	Smooth muscle cell	Case 1	Case 2
CD68	Dako (Glostrup, Denmark)	Histiocytes	+ (f)	+
Vimentin	Dako	Mesenchymal cells	+	+ (f)
S-100	Dako	Interdigitating cells, melanocytic cells, etc	-	-
MAK-6	Ciba (Alamendo, CA, USA)	Epithelial cells	-	-
CD21	Dako	Follicular dendritic cell	-	-
Ber-MAC-DRC	Dako	Follicular dendritic cell	-	-
KI-M4	*	Follicular dendritic cell	-	-

(f) = focally positive.

* Kindly donated by Prof M R Parwaresch, Kiel, Germany.

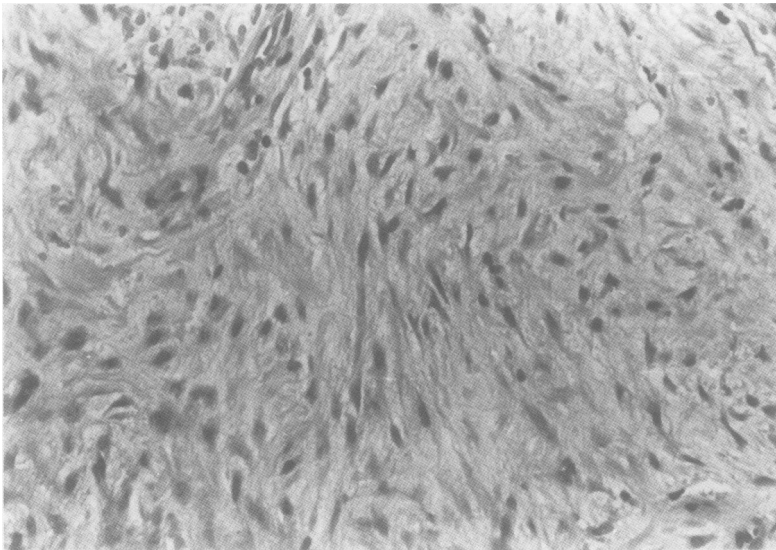


Figure 5 Spindle cells in a myxoid background, resembling nodular fasciitis ($\times 240$).

were not seen. Special stains for microorganisms, including mycobacteria and fungi, were negative. The majority of these plump spindle cells stained strongly for vimentin and smooth muscle actin and only a minority was positive for CD68. They were negative for S-100, MAK-6, CD21, Ber-MAC-DRC, and Ki-M4 (table 1). Scattered CD68 positive macrophages were found among the chronic inflammatory cells. The plasma cells and lymphocytes showed no light chain restriction. The cyst was lined by ulcerated, non-keratinised, stratified squamous epithelium with a fibrotic wall, consistent with an infected residual cyst.

The patient was well at 13 months follow up with no recurrence of tumour.

Discussion

Inflammatory pseudotumour of the oral cavity is very rare and only eight previous reported cases are to be found in English language publications (table 2). It occurs in a wide age range (19 months to 63 years), but it tends to affect children and young adults. The cheek and the mandible are the sites of predilection. It presents as an intraoral painless swelling of relative short duration, which is firm and indurated on physical examination. Unlike its counterpart in the visceral organs, oral inflammatory pseudotumour does not produce significant systemic symptoms, and routine blood investigations are normal. Magnetic resonance imaging or a CT scan was done in two of the reported cases and in both of our patients.

All were characterised by infiltrative margins, and were interpreted on radiological grounds as aggressive malignant neoplasms.

The cause of inflammatory pseudotumour remains unknown and microbiological culture result is usually negative although *Escherichia coli* has been found in an example of inflammatory pseudotumour of the liver.¹¹ Morphologically similar lesions caused by mycobacteria have been described in the skin,¹² lymph node¹³ bone marrow,¹⁴ and lung¹⁵ in immunosuppressed transplant patients or patients with acquired immunodeficiency syndrome. When it occurs in the mandible, inflammatory pseudotumour is usually associated with dental granuloma and in addition to the characteristic spindle cells there are also abundant foam cells, cholesterol clefts, and giant cells.^{6,7} Such concomitant presence of dental granuloma and a chronically inflamed cyst in our case 2 may lend support to the idea that inflammatory pseudotumour is an unusual tissue reaction to chronic inflammation.

Histologically, inflammatory pseudotumour of the oral cavity is similar to that of other organs, although a nodular fasciitis-like area has never been described. The proportion of spindle cells, foam cells, lymphocytes, and plasma cells is highly variable, and Chen¹⁶ reported an increased proportion of foam cells in a subsequent follow up biopsy specimen in a case of inflammatory pseudotumour of the liver. Furthermore the immunophenotype of the spindle cells is also highly variable; the plump spindle cells in case 2 were strongly positive for vimentin and smooth muscle actin but only weakly and sparingly positive for CD68, while in case 1 they were strongly positive for CD68 and weakly positive for smooth muscle actin and vimentin. This observation is consistent with the concept that these spindle cells are of fibrohistiocytic nature, showing the immunohistochemical phenotypes of both histiocytes and myofibroblasts.¹⁷ A similar observation has also been reported in inflammatory pseudotumours of the major salivary gland⁴ and the liver.² The spindle cells in case 1 were more elongated and appeared epithelioid, which raises the possibility of granulomatous inflammation in cytological preparations. The cytological features of inflammatory pseudotumour have been described rarely.^{18,19} It is generally accepted that a definite cytological diagnosis of inflammatory pseudotumour cannot be made by fine needle aspiration cytology because the predominant cell pattern is non-specific.¹⁸

Table 2 Summary of reported cases of oral inflammatory pseudotumour

Author	Sex	Age	Site	Follow up data
Liston <i>et al</i> ⁵	F	4	Right cheek	No recurrence at 6 months
	?	19 m	Left cheek	No recurrence at 10 months
	M	6	Right cheek	?
Rudy <i>et al</i> ⁶	F	49	Right lower jaw	No recurrence at 10 months
Zegarelli <i>et al</i> ⁷	F	56	Mandible	No recurrence at 1 year
Acevedo and Buhler ⁸	F	49	Gingiva	?
Earl <i>et al</i> ⁹	M	44	Right mandible	No recurrence at 2 years
Inui <i>et al</i> ¹⁰	M	63	Right mandible	No recurrence at 2.5 years
Shek <i>et al</i>	M	20	Right cheek	No recurrence at 13 months
(present study)	F	36	Left maxilla	No recurrence at 13 months

Being a fibrohistiocytic lesion, inflammatory pseudotumour may be misinterpreted by the histopathologist as being a neoplastic or quasi-neoplastic condition of the myofibroblasts, such as nodular fasciitis, fibromatosis, or fibrosarcoma. The positive immunohistochemical stain for actin in inflammatory pseudotumour can be a potential diagnostic pitfall and it may be mistaken as a leiomyosarcoma. Oral inflammatory pseudotumour needs to be distinguished from the recently described follicular dendritic cell tumour of the oral cavity,²⁰ which runs an indolent course with a tendency of local recurrence. Nodular fasciitis uncommonly occurs in the oral cavity and it is characterised histologically by the presence of loose myxoid matrix containing short linear curved fascicles of spindle cells.^{21,22} Although focal nodular fasciitis-like area was detected in case 2, inflammatory pseudotumour can be distinguished by the presence of longer fascicles of spindle cells in an inflammatory background rich in plasma cells. Fibromatosis of the oral cavity usually occurs in young adults and it is characterised histologically by broad interlacing fascicles of mature fibroblasts with a variable degree of collagenisation.²³ An inflammatory component is absent. It is notoriously difficult to separate fibromatosis from well differentiated fibrosarcoma, especially in infants and juveniles in whom fibromatoses are characterised by higher mitotic rates than in adults. Its distinction from inflammatory pseudotumour can be established by the absence of an inflammatory component. Follicular dendritic cell tumour of the oral cavity is a recently described entity which can closely mimic inflammatory pseudotumour, with whorls or fascicles of plump spindle cells in an inflammatory background of lymphocytes and histiocytes.²⁰ In contrast, plasma cells constitute a significant proportion of the chronic inflammatory cells in inflammatory pseudotumour. The distinction can be established by the positive staining for CD21, Ber-MAC-DRC, and Ki-M4 in follicular dendritic cell tumour.²⁰

In conclusion, inflammatory pseudotumour of the oral cavity is a distinct pathological entity characterised by fascicles of spindle cells in an inflammatory background rich in plasma cells. Clinically and radiographically it may be misinterpreted as a malignant neoplasm. Cytologic diagnosis on fine needle aspiration can rarely reach a definitive diagnosis and excisional biopsy is usually required. Treatment is complete

surgical resection which is curative. No death has been ascribed to it when it occurs in the oral cavity. Its correct recognition by surgical pathologists is, therefore, vital in order to avoid unnecessary extensive and radical surgery.

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