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CASE REPORT

Smooth muscle hamartoma of the hard palate

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A small polypoid lesion was removed from the incisive papilla region of a healthy female aged 8 years. It was composed of non-cycling smooth muscle fibres that were immunoreactive for various muscle antigens, surrounded by basement membrane containing collagen IV, arranged as bundles and mixed with CD34(+) interstitial cells, mast cells, dendrocytes and nerves. The lesion could be attributed to dysgenesis affecting media of vessels emerging from the incisive foramen. Intra-oral smooth muscle hamartomas tend to favour regions featuring complex developmental events.
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Keywords: hamartoma; immunohistochemistry; palate; smooth muscle

An 8-year-old Caucasian female presented with a painless lesion on palate. It had been present since birth and gradually increased in size. On examination, a pedunculated, smooth, light pink, soft polypoid lesion, 0.6 cm in diameter, was seen on the incisive papilla region of the hard palate. Otherwise, the physical examination was unremarkable and the radiology was normal. The lesion was excised under local anaesthesia, fixed in buffered formalin and submitted for histological examination. Routine sections were prepared and stained with haematoxylin and eosin, and immunohistochemically with antibodies to demonstrate intermediate filaments, stromal and basement membrane constituents, and cell cycle antigens (Table 1).

Histologically, the tumour was centred on and expanded lamina propria, and was covered by intact parakeratinizing oral epithelium (Fig. 1). It comprised a non-encapsulated mass of loosely arranged bundles of differentiated smooth muscle fibres that were set in fibrous stroma with nerve fascicles and thin-walled vessels (Figs 2 and 3). Cytological atypia and mitotic activity were not seen. The smooth muscle fibres stained positively for caldesmon, SMA and desmin (Figs 4–6). Punctuate collagen IV immunoreactivity surrounded the fibres (Fig. 7), but laminin was not detected. The nerve fascicles and vessels showed S-100 protein and CD34 immunoreactivity, respectively. Interstitial cells expressing the CD34 antigen were prominent between the bundles of smooth muscle fibres (Fig. 8) and scattered dendrocytes were also present (Fig. 9). Immunostaining for CD117 antigen demonstrated mast cells in the tumour stroma (Fig. 10a), and prominent melanocytes in covering epithelium (Fig. 10b). Ki67 immunoreactivity was confined to the lowermost layers of the epithelium.

Removal of the lesion was complete. Healing was uneventful and, 6 months later, there was no evidence of recurrence.

Comments

The clinical, histological and immunohistochemical features of the present case correspond with a dysgenetic growth of smooth muscle (leiomyomatous hamartoma) of the hard palate. Intra-oral smooth muscle hamartomas are rare. Nine cases are found in the English literature (Table 2), which include two cases on the palate (1, 4), and Semba et al. reviewed four further cases on median maxilla described by Japanese authors (2). The locations (Table 2) suggest that intra-oral smooth muscle hamartomas tend to occur at sites where fusion of processes and prominences occurs in the developing embryo. The events are complex and prone to errors (10). There are differences in the age of removal of intra-oral smooth muscle hamartomas (Table 2). Possibly, lesions on anterior maxillary alveolar ridge and posterior tongue interfered with feeding and drew early attention.

The histological diagnosis of intra-oral smooth muscle hamartoma is straightforward. Despite the well-differentiated phenotype of the smooth muscle fibres and lack of mitotic activity, the differential from leiomyosarcoma has been discussed in length (4). Of greater interest is the distinction from leiomyoma as one case has been reported as such (1). Useful distinguishing criteria include the usual presentation of leiomyomas in adults (11, 12), their larger size and the apposition rather

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Table 1 Description of antibodies

Antibody clone	*Specificity*	*Pre-treatment*	*Dilution*	*Source*
1A4	Smooth muscle actin (SMA)	–	1:50	Dako[a]
h-CD	Caldesmon	Pressure cooker (3 min)	1:50	Dako
D33	Desmin	–	1:40	Dako
QBEnd 10	CD34	Trypsin (37°C; 30 min)	1:50	Dako
Polyclonal	Factor XIIIα	Trypsin (37°C; 30 min)	1:200	Biogenesis[b]
Polyclonal	CD117	Pressure cooker (3 min)	1:200	Dako
Polyclonal	S-100 protein	Trypsin (37°C; 30 min)	1:3000	Dako
Clone LAM-89	Laminin	Trypsin (37°C; 60 min)	1:30	NCL[c]
COL-94	Collagen IV	Trypsin (37°C; 30 min)	1:200	Sigma[d]
MM1	Ki67	Pressure cooker (3 min)	1:200	NCL

[a]Dako Ltd, Cambridge, UK.
[b]Biogenesis Ltd, Poole, UK.
[c]Novocastra Laboratories Ltd, Newcastle upon-Tyne, UK.
[d]Sigma Chemical Co., Dorset, UK.

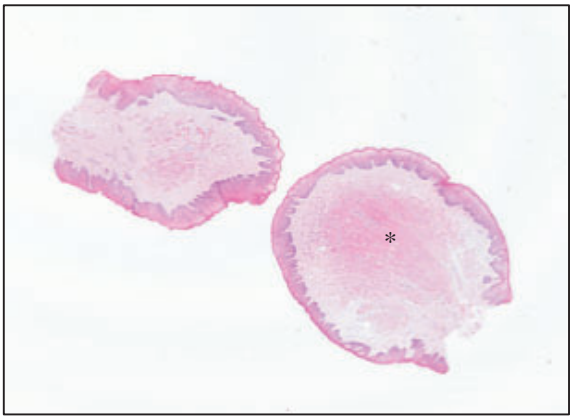

Figure 1 Section oriented vertical to the mucosal surface. The polypoid outline results from an ill-defined 'pink' growth (asterisk), which markedly expands the lamina propria.

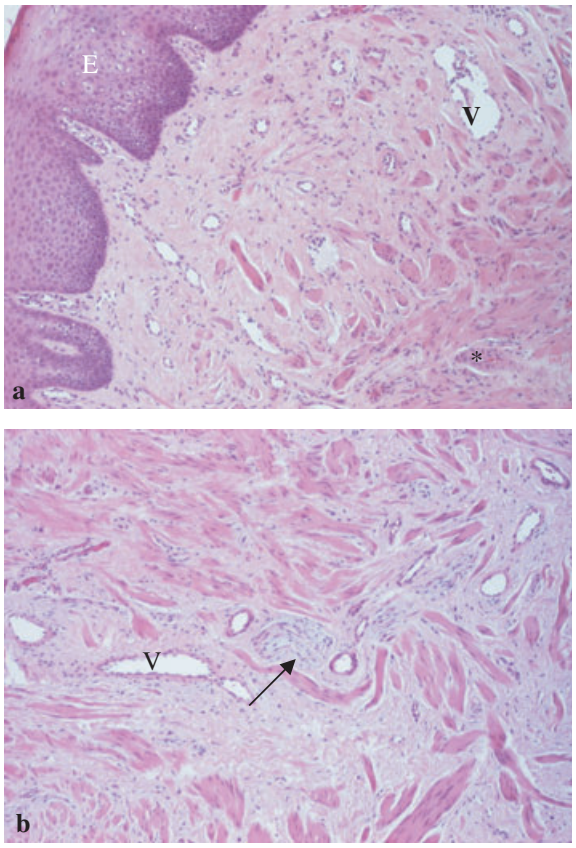

Figure 2 (a and b) The growth is composed of short discrete thin eosinophilic bundles arranged in an irregular pattern. The intervening stroma is fibrous and includes ectatic vessels lined by a single endothelial layer (V). There is no capsule and the growth is separated from surface epithelium (E) by a non-inflamed Grenz zone. Small nerve fascicles (arrow) are present in the centre of the growth.

than loose arrangement of the discrete bundles of smooth muscle fibres (12). In addition, proliferating cells demonstrable on immunohistochemistry for cell cycle antigens are seen in leiomyomas (13), whereas our findings indicate that hamartomatous muscle fibres remain in the quiescent phase of the cell cycle. This accords with differences between neoplasia and dysgenesis. Intra-oral leiomyomas, in contrast to smooth muscle hamartomas (Table 2), are more common in males and on lips and tongue (11).

Special stains and immunohistochemistry are hardly required for the histological diagnosis of intra-oral smooth muscle hamartoma, but simple immunohistochemical profiling has been attempted in most published cases (Table 2). One case has also been investigated by electron microscopy (2). In the present case, the more detailed immunohistochemical profiling allowed the demonstration of collagen IV immunoreactivity around the smooth muscle fibres, which corresponds to the ultrastructurally demonstrated basement membrane therein (2). That the sites lacked laminin immunoreactivity suggests selective expression of basement membrane antigens and, in this context, the decreased expression of laminin in smooth muscle tumours than in nerve sheath tumours appears of interest (14). The finding of mast cells interstitially, accords with the presence of these cells in smooth muscle tumours (15), whereas the prominent intraepithelial melanocytes remind of the controversial association between cutaneous smooth muscle hamartoma and Becker's naevus (12).

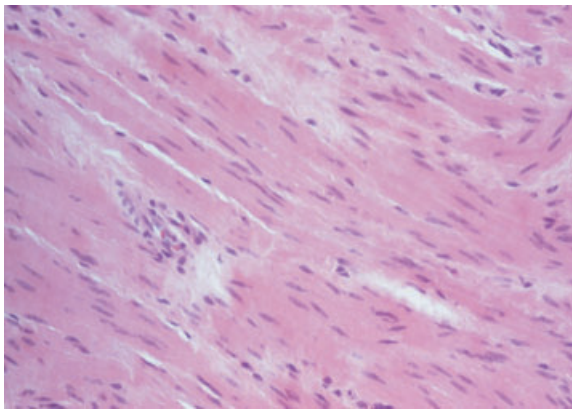

Figure 3 The bundles are composed of elongated cells with poorly perceived borders, eosinophilic cytoplasm and nuclei possessing rounded, 'cigar-shaped' ends. There are no mitoses.

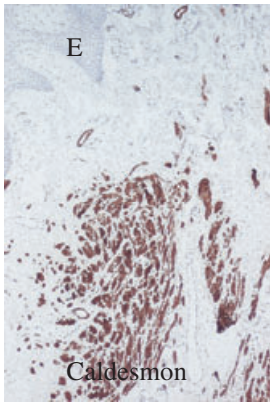

Figure 4 Caldesmon is strongly expressed in the bundles, but not in the surface epithelium (E).

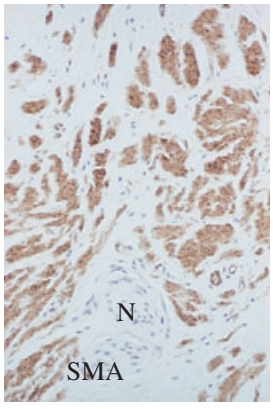

Figure 5 SMA is expressed in the bundles, but not in the nerve facicles (N).

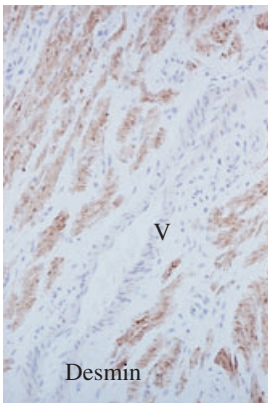

Figure 6 Desmin is expressed in the bundles, but not in vascular media (V).

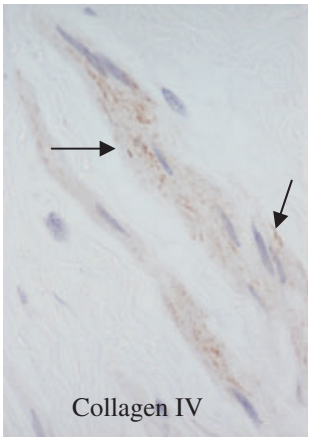

Figure 7 Expression of collagen IV associated with bundles is arrowed.

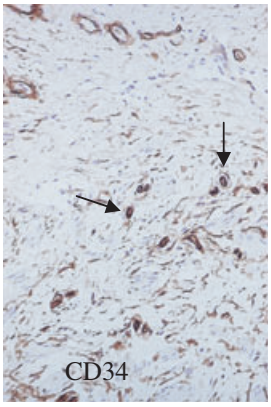

Figure 8 CD34 is expressed in many interstitial cells (lower right part of the field). Small vessels (arrows) are also stained.

Our findings also indicate that except for mast cells and occasional dendrocytes, the hamartomatous smooth muscle is associated with abundant CD34(+) interstitial cells. Such abundance is also a feature of cutaneous smooth muscle hamartomas (16) and there are two explanations for it. First, CD34(+) interstitial cells could be an intrinsic component of the hamartoma (16). Secondly, these cells could simply reflect the particular localization on the incisive papilla region, as in the present instance, or periadnexally, as in cutaneous regions. Small vessels are emerging from the underlying incisive foramen (10), and the perivascular and peri-

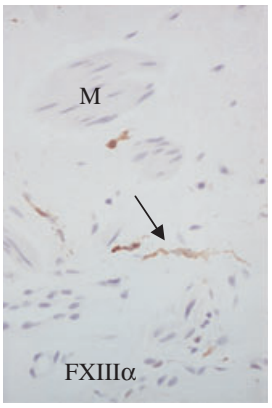

Figure 9 Factor XIIIα is expressed in scattered dendrocytes (arrow), but not in the bundles (M).

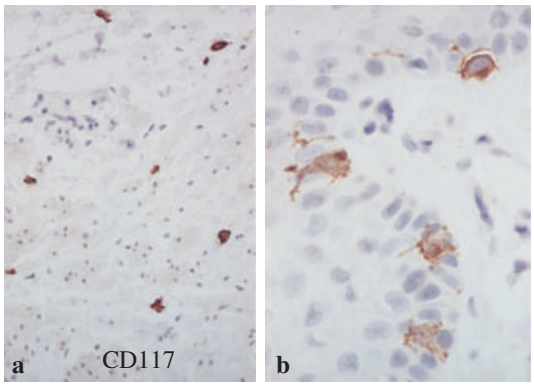

Figure 10 Expression of CD117 in mast cells (a) and intraepithelial basal melanocytes (b).

adnexal concentration of CD34(+) interstitial cells is established (17). In this context, the present lesion could be attributed to dysgenetic events affecting media of those vessels.

Smooth muscle hamartomas should be considered in the clinical differential diagnosis of swellings on oral mucosa and gingivae in children.

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Table 2 Cases of intra-oral smooth muscle hamartoma

Authors	*Age*	*Sex*	*Site*	*Size (cm)*	*Duration*	*Special stains and immunohistochemistry*
Ng et al. (1)	3 months	F	Incisive papilla	0.9 × 0.4	Present at birth	PTAH
Semba et al. (2)	2 years	M	Anterior maxillary alveolar ridge	0.5	Present at birth	Azan-Mallory, PAS, diastase-PAS, desmin, vimentin, S-100 protein
Goldsmith et al. (3)	16 months	M	Posterior tongue			–
Napier et al. (4)	5 years	F	Anterior, hard palate	1.0	Several years	SMA, desmin
Rosa-Garcia and Mosqueda-Taylor (5)	6 years	M	Right, anterior tongue	1.3 × 0.3 × 0.3	Present at birth	SMA, desmin, S-100 protein
Takeda et al. (6)	10 months	M	Anterior maxillary alveolar ridge	0.6	Present at birth	SMA, desmin, GFAP, neurone-specific enolase, S-100 protein
Kobayashi et al. (7)	3 months	M	Mid-dorsum of tongue	1.4 × 1.0 × 0.5	Present at birth	SMA
Correa et al. (8)	6 years	F	Midline, maxillary buccal gingivae	0.5	Present at birth	SMA, desmin, S-100 protein
Kujan et al. (9)	11 months	F	Anterior portion of the maxillary alveolar ridge	1.0 × 0.5	Present at birth	SMA, desmin, S-100 protein

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