

# Chondroid metaplasia of the tongue: A case report and histological analysis

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## Abstract

Chondroid metaplasia is infrequently reported in the head and neck and rarely in the tongue. We identified a further case of lingual chondroid metaplasia in a patient who presented with a sore indurated swelling of the dorsal tongue. Unusually, aside from smoking, there appeared to be no obvious aetiological factor. To gain further insight, histological analysis of a retrospective series of tongue biopsies and excision specimens was undertaken. Chondroid metaplasia was found in a further 4 cases, occurring within the submucosal fibrous layer of the dorsum of the tongue. We suggest that chondroid metaplasia in this location occurs more frequently than has been previously reported.

## Keywords

chondroid metaplasia; tongue; submucosal fibrous layer

## Introduction

Metaplasia is defined as reversible change in which one adult cell type is replaced by another in response to an adverse environment [1]. Chondroid metaplasia is rarely reported in head and neck. It is described in association with trauma and is termed a Cutright tumour when it occurs on the crest of the alveolar ridge in a denture wearer [2]. We have found only three published reports of chondroid lesions in the tongue [3,4,5].

## Case Presentation

A 65 year old lady presented with a sore tongue of three months duration. Shortly after the onset of symptoms she stopped smoking. She was being treated for hypothyroidism, hypertension and ischemic heart disease with aspirin, thyroxine, bisoprolol, valsartan, atorvastatin, nicorandil and paroxetine. She drank approximately 28 units of alcohol per week.

Clinical examination revealed an erythematous, indurated swelling in the midline of the middle third of the tongue. There was no ulceration. An incisional biopsy was performed the following day and it was noted that the lesion felt hard and was difficult to cut with a scalpel blade.

On microscopy (Figures 1 & 2) intact squamous epithelium overlies chronically inflamed lamina propria and a plate of cartilaginous tissue 1.1 mm thick, lying 1.2mm deep to the base of the epithelium, comprising clusters of mature chondrocytes in hyaline matrix (Figure 3). This merges with underlying fibres of normal skeletal muscle. The histological diagnosis is chondroid metaplasia with no evidence of

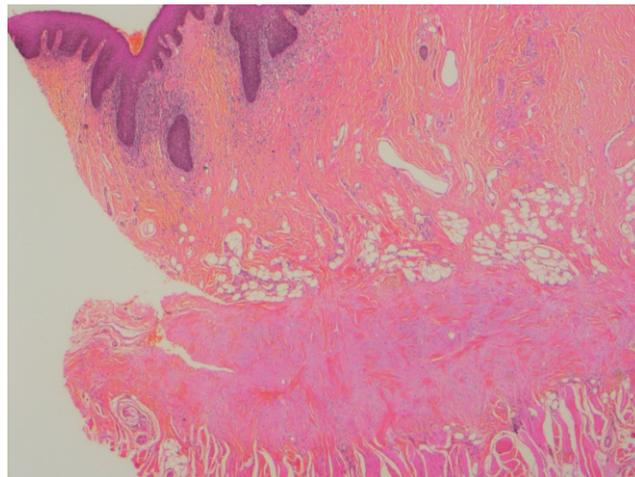
malignancy. There is acute on chronic inflammation of the epithelium with dilated capillaries in the lamina propria (Figure 4). Candida is not present.

At review 10 months later the patient was asymptomatic, clinically the erythema had resolved and there was no change in appearance of the tongue (Figure 5).

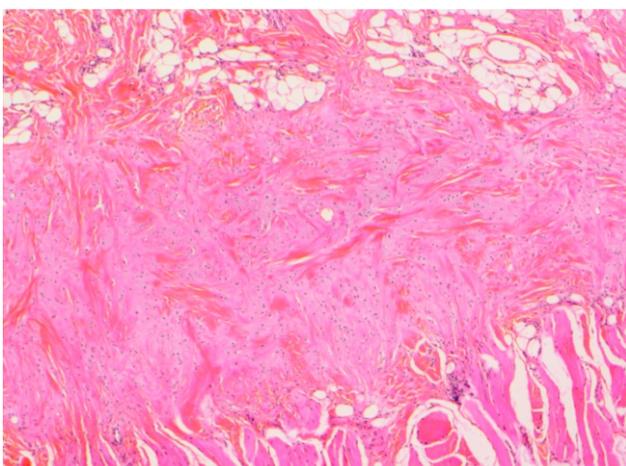
## Case Series

Following examination of this case, we reviewed a series of tongue biopsies and partial or whole glossectomy excision specimens received in our department over one year for the occurrence of chondroid metaplasia. Out of 238 tongue biopsies and resections, 34 resection specimens were identified and 27 were of adequate size and depth to visualise the submucosal fibrous membrane.

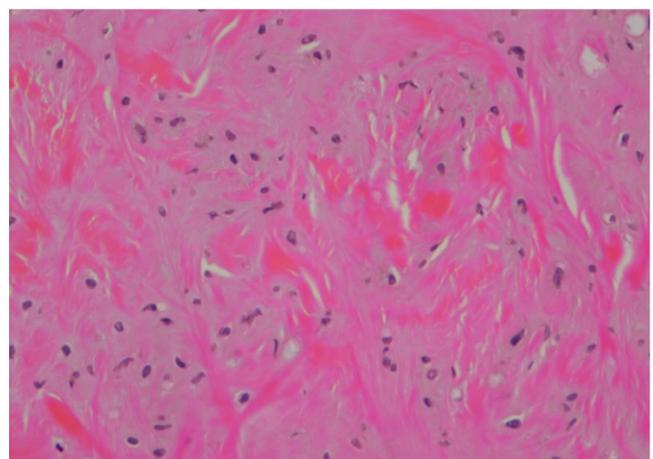
We found chondroid metaplasia in 4 cases, all from primary surgical resections for squamous cell carcinoma. This was seen as a plate of cartilaginous tissue 0.7-1.1mm thick, 0.5-0.6mm deep to the basal layer of epithelium, developing within the submucosal fibrous layer of the dorsum of the tongue. In two cases the metaplasia extended up to the carcinoma. The length of the segment of metaplasia ranged from 9-18mm at least, as in each case the metaplasia reached the medial resection margin and its extent beyond this is not known. There were two male patients aged 58 and 62 years, and two females 73 and 80 (representative images in Figures 6 and 7).



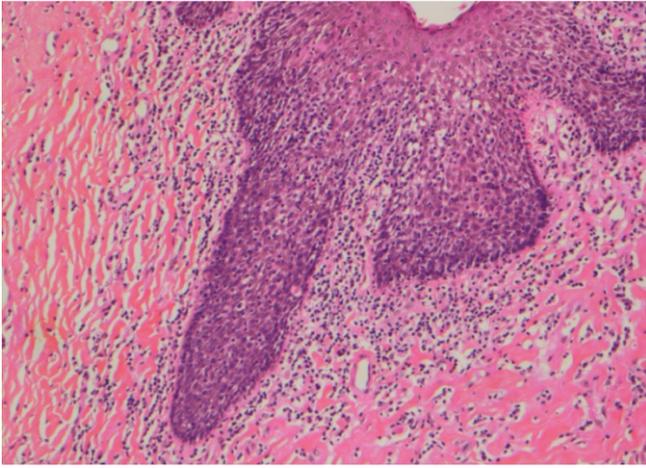
**Figure 1:** Thick band of fibrous tissue containing groups of chondrocytes. There is vascular telangiectasia above the lesion. Skeletal muscle fibres insert into the inferior surface. (HE x 20)



**Figure 2:** Hyaline fibrous tissue containing groups of chondrocytes. (HE x 40)



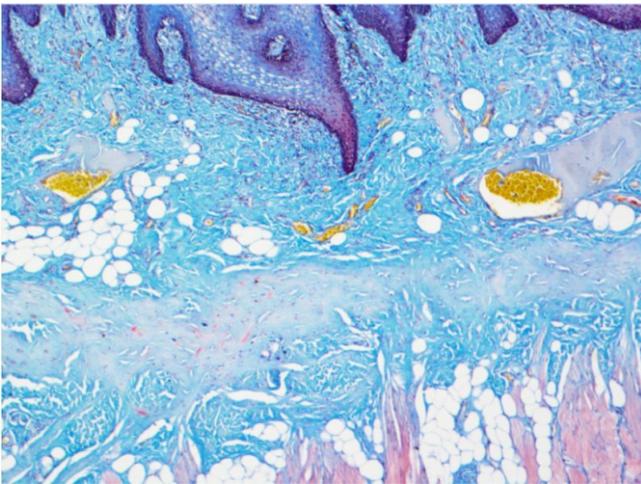
**Figure 3:** High power view of groups of chondrocytes in cartilaginous matrix. (HE x 200)



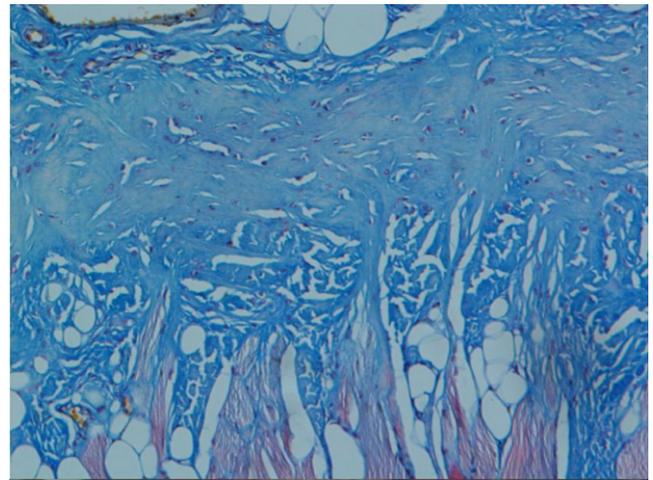
**Figure 4:** Chronic inflammation of the overlying squamous epithelium. (HE x 100)



**Figure 5:** Clinical photograph of dorsal tongue showing healed biopsy site\*.



**Figure 6:** Hemi-glossectomy for carcinoma. Thick band of fibrous tissue containing groups of chondrocytes. (Martius Scarlet Blue x 40)



**Figure 7:** Hemi-glossectomy for carcinoma. High power of groups of chondrocytes in cartilaginous matrix. (Martius Scarlet Blue x 100)

## Discussion

Chondroid metaplasia has been reported both independently and in association with soft tissue neoplasms. Isolated lesions have been described in the larynx; chondrometaplasia of the false vocal fold [6], true vocal fold [7] and the ventricle [8,9] and in the flabby ridges of edentulous patients [10]. There are three previously reported cases of chondroid metaplasia of the tongue:

1. 42 year old man with a pedunculated polypoid lesion near the tip of the tongue, with a history of having burned the area prior to onset of the lesion. Histological examination identified hyperplastic epithelium overlying a fibrous nodule of lingual mucosa indistinctly separated from surrounding partially formed cartilaginous areas and diagnosed as chondroid metaplasia within a fibroepithelial polyp [3].

2. 14 year old girl who presented with a frequently bitten and progressively enlarging nodule on the lateral border of her tongue with a firm consistency on palpation. Histological examination showed hyperplastic parakeratinized stratified squamous epithelium overlying fibrovascular connective tissue containing hyaline cartilage [4].

3. 65 year old lady with a long history of smoking, who had previously been treated for SCC with

tonsillectomy and radiotherapy eleven years prior to the onset of a “sore bump” on her tongue. Histological analysis showed squamous mucosa with epithelial hyperplasia and mild chronic inflammation overlying a band of cartilage within the submucosal tissues just above normal looking skeletal muscle. Possible aetiology was attributed to chronic inflammation related to radiotherapy (xerostomia and oral Candidiasis), and suspected repeated mechanical trauma from denture wearing [5].

In our index case and in the series hemi-glossectomy specimens, the cartilaginous metaplasia occurred in the sub-mucosal fibrous layer. Anatomically, the muscles of the tongue are grouped into four pairs of intrinsic muscles and four pairs of extrinsic muscles. The paired muscles are separated in the midline by a vertical sheet of fibrous connective tissue, the lingual septum. The submucosal fibrous layer of the dorsum of the tongue, is orientated in the horizontal plane and provides attachment for two of the intrinsic tongue muscles. The vertical fibres pass directly between the upper and lower surfaces, taking origin from the submucosal fibrous layer of the dorsum of the tongue with insertion on the ventral surface particularly at the lateral borders of the tongue. Longitudinal fibres lie parallel to the dorsal surface of the tongue, running in an antero-posterior direction; the superior longitudinal fibres take origin from the submucosal fibrous layer of the dorsum of the tongue.

Our review of surgical cases, suggests that chondroid metaplasia within the submucosal fibrous membrane occurs more frequently than has been reported. Our index case, the lady reported by Kohl et al [5] and the four surgical excisions all occurred in cigarette smokers, but this may simply reflect the greater incidence of pathological lesions in smokers.

In general, metaplasia may be induced by repetitive physical trauma or chemical irritation, with inflammation and regeneration leading to one differentiated cell type being replaced with another, possibly through re-programming of stem cells. In the three published cases above, repetitive physical trauma, a burn, and possibly radiation or chronic infection may have been initiating factors. In our case no injury was reported and mid-tongue is not subject to dental trauma, but there was inflammation and telangiectasia in the overlying tissue. Its presence in glossectomies for cancer might relate to disturbance of normal biomechanics of tongue movement caused by the presence of the tumour or perhaps to substances such as cytokines released by the tumour or the inflammatory response to the tumour. On the other hand, it may bear no relationship to the more superficial pathological changes and may be an incidental finding. Wider recognition and reporting of this phenomenon in biopsy material may clarify this issue.

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