



## Spindle cell carcinoma of the mandible: a case report

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### Abstract

Spindle cell carcinoma is a rare highly malignant squamous cell carcinoma. Here, we describe a case of a 74-year-old Chinese female who presented with a 2-week history of pain and swelling in the left retromolar region. Surgical resection and titanium plate prosthesis were performed and histological analysis revealed spindle squamous cell carcinoma.

**Keywords:** mandible, sarcomatoid carcinoma, spindle squamous cell carcinoma, prognosis, treatment

### Introduction

Spindle cell carcinoma is a rare highly malignant squamous cell carcinoma. It is well accepted that this biphasic tumor is composed of squamous cell carcinoma (in situ or invasive) and sarcomatous spindle cell carcinoma. The latter has been described by various terms, including spindle cell squamous carcinoma, carcinosarcoma, pseudosarcoma, and pleomorphic carcinoma. We present a case of sarcomatous spindle cell carcinoma in a 74-year-old Chinese female who was managed by surgical resection and left mandible and titanium plate prosthesis.

### Case report

A 74-year-old Chinese female patient was transferred to the Affiliated Stomatological Hospital of Nanjing Medical University with a 2-week history of pain and swelling in the left retromolar region. A poly-

loid lesion measuring 20×25 mm was observed. The patient had diabetes mellitus and hypertension. Her medical history also included wide surgical excision of an upper left gingival neoplasm, partial maxillectomy and radical operation for the tongue, jaw and neck owing to upper left gingival squamous cell carcinoma and right tongue squamous cell carcinoma in February, 2005. The patient received radiotherapy with <sup>60</sup>Co, up to a total dose of 40 Gy, after surgery from March 21 to April 15, 2005, followed by further resection to the left side of the tongue owing to tongue leukoplakia on August 31, 2007 and enlarged resection of lower left periodontal lesions on account of gingival squamous cell carcinoma located at the left premolar area of the mandible in July 2010.

Intraoral examination indicated that the patient's teeth were all absent. In addition, a polypoid lesion measuring 20×25 mm was noted in the front of the left pterygomandibular fold on the mandible, which was accompanied with pain on pressure (**Fig. 1A**). A part of

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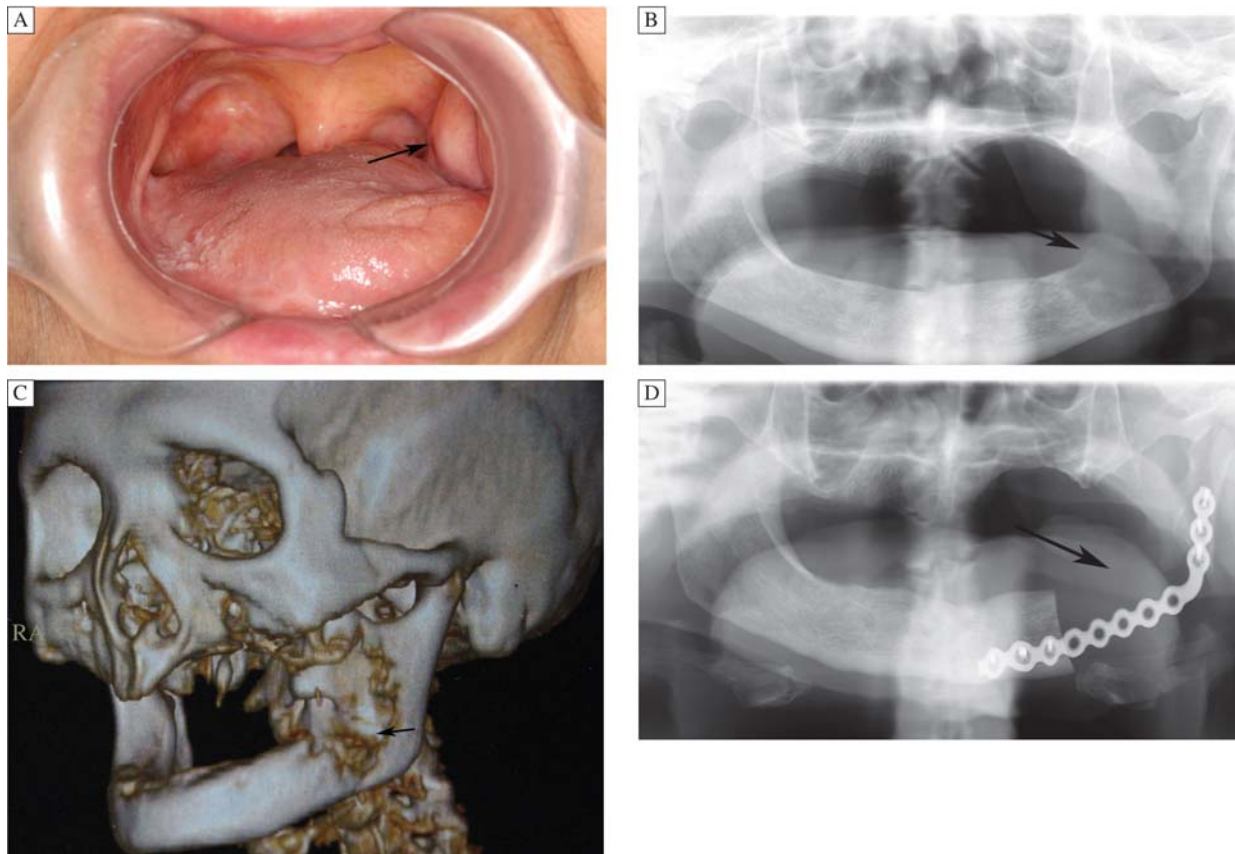
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**Fig. 1 Medical examinations of patient.** A: Intraoral examination reveals a polypoid lesion measuring 20×25 mm on the front left pterygomandibular fold of the mandible. B: An orthopantomogram radiograph reveals a low-density shadow in the left molar region. C: Computed tomography revealed that the maximum dimension of the lesion measured 3.8 cm×3.2 cm. In addition, the margins were unclear, there was left mandibular osseous necrosis and part of the left maxilla was missing. The arrow indicates the scope of the lesion in CT. D: An orthopantomogram radiograph showing titanium plate prosthesis.

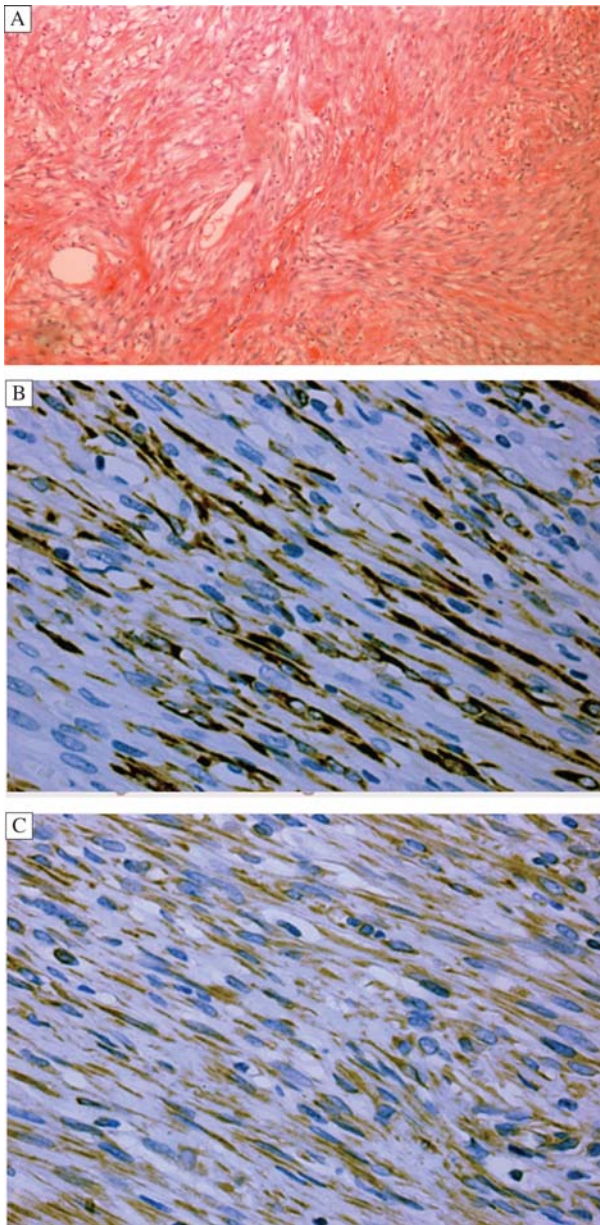
the left maxilla was missing and the postoperative scar on the ventral area of the tongue had healed completely. Furthermore, adhesions were present on the tongue and mouth floor tissue and there was restricted movement without numbness. The extra-oral examination showed that although the patient's face was asymmetrical, the surgical scar on the center of the lower lip and chin, to the right of the jaw and neck had healed. On the trailing edge of the left mandible, a hard mass was palpable and was accompanied by mild pain. However, the overlying skin had a normal appearance. No enlarged lymph nodes were palpable in the submandibular triangle and neck.

An orthopantomogram radiograph revealed a low-density shadow in the left molar region (**Fig. 1B**). Computed tomography revealed that the maximum dimension of the lesion measured 3.863.2 cm. In addition, the margins were unclear, there was left mandibular osseous necrosis, and part of the left maxilla was missing (**Fig. 1C**). Given the poorly differentiated gingival squamous cell carcinoma, surgical resection and titanium plate prosthesis were performed (**Fig. 1D**).

Histologically, the bulk of the tumor was composed

of proliferated spindle shaped cells, which were arranged in a fascicular pattern, or slice formation. Some tumor cells showed an increasing mitotic activity as well as pleomorphism; there were also plasmacytoid and inflammatory cells, suggesting that this was a spindle cell lesion (**Fig. 2A**). Immuno-histochemical analyses showed a positive staining for creatine kinase, vimentin and smooth muscle actin (SMA); weakly positive staining for CD99 and calponin and negative staining for S-100, epithelial membrane protein (EMA), human melanoma black 45 (HMB45), CD31, CD34, MyoD1, desmin, actin, LCA, glial fibrillary acidic protein (GFAP) and Bcl-2, thereby confirming the diagnosis of spindle cell carcinoma (**Fig. 2B** and **2C**).

With the patient's history of gingival squamous cell carcinoma, this mandibular tumor was considered to be a recurrence and de-differentiation of the previous tumor because of its position near the previous tumor site. Based on the patient's medical history, her clinical presentation and positive results for creatine kinase and vimentin, we entertained a diagnosis of sarcomatoid carcinoma. The patient died after approximately five consent was obtained from the son of the patient for



**Fig. 2 Histology examination of cancer lesion.** A: H&E staining. Tumour cells are present in a fascicular pattern or slice formation. Partial tumour cells show increased mitotic activity as well as pleomorphism, and these cells also consist of plasmacytoid and inflammatory cells, suggestive of a spindle cell lesion. B and C: Immunohistochemical features of the gingiva spindle cell tumor. B: Creatine kinase is positive in the tumor cells.  $\times 400$ . C: Vimentin is positive in the tumor cells.  $\times 400$ .

publication of this case report and any accompanying images.

## Discussion

Sarcomatoid carcinoma is a type of malignant mixed tumor that is extremely rare in the mandible. The sarcomatous components are derived from the squa-

mous epithelium with divergent mesenchymal differentiation<sup>[1]</sup>.

Spindle cell carcinoma most often affects elderly men, with a peak incidence in the sixth to seventh decade<sup>[2]</sup>. Reportedly, approximately 50% to 70% of head and neck spindle cell carcinoma presents as polypoid or exophytic lesions, sometimes with a stalk<sup>[3]</sup>. In this case, the lesion was polypoid, and the patient underwent radiotherapy with <sup>60</sup>Co up to a total dose of 40 Gy. It is possible that this could have led to spindle cell carcinoma of the mandible. The oral cavity is the most common primary site, followed by the larynx, oropharynx/hypopharynx, maxilla and metastatic nodes<sup>[4]</sup>. This is the second detailed report in the English language literature of spindle cell carcinoma affecting the mandible.

The immunohistochemical study revealed that the cytokeratin positivity was significantly higher in spindle cell carcinoma than in the spindle cell and squamous cell components of spindle cell carcinoma. In addition, in comparison with the spindle cell component, the squamous cell areas of spindle cell carcinoma had a higher mean positivity for cytokeratin<sup>[5]</sup>; the spindle-shaped tumor cells were positive for vimentin but not for keratin and EMA. The results may indicate that these cells have acquired mesenchymal properties. Vimentin is the most common cytoskeletal marker for mesenchymal cells<sup>[6]</sup>. Reportedly, keratin expression decreases, whereas vimentin expression increases in the spindle cells of spindle cell carcinoma<sup>[7]</sup>. Immunostaining for pan-cytokeratin and EMA may be very useful; however, it is not uniformly positive for these tumors. Lewis et al. found that p63 staining was the most diagnostically useful tool, particularly in head and neck sarcomatoid carcinomas<sup>[4]</sup>.

Surgical excision was the widely preferred treatment and most authors agreed that irradiation was ineffective. There was no significant difference in the length of survival between patients managed by radiation alone and those managed by both radiation and a salvage procedure<sup>[8]</sup>. However, radiation therapy was considered to be an acceptable alternative for inoperable cases. In addition, adjuvant irradiation may benefit cases in which the surgical margins are positive or cases with nodal metastasis at the time of diagnosis<sup>[9]</sup>.

Leventon et al. found that survival was related to the depth of invasion; patients with deeply invasive tumors had a low survival rate whereas those with superficial tumors had an excellent survival prognosis<sup>[2]</sup>. A low tumor stage and the absence of previous irradiation also indicate a better prognosis. Thompson reported that the survival rate of 39 patients with a negative immunohistochemical profile for epithelial markers was signifi-

cantly higher than that of 84 patients with positive immunoreactivity for epithelial markers<sup>[8]</sup>.

Numerous hypotheses regarding the histogenesis of this type of tumor have been proposed. Three dominant pathogenetic theories have been proposed: (1) the tumor represents a ‘collision tumor’ (carcino-sarcoma);

(2) the tumor is an squamous cell carcinoma with an atypical reactive stroma (pseudosarcoma) or (3) the tumor is of epithelial origin, with ‘de-differentiation’ or transformation to a spindle cell morphology (sarcomatoid carcinoma). In recent years, the third hypothesis has been supported by findings obtained using modern techniques, including electron microscopy and immunohistochemistry<sup>[10]</sup>.

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### References

- [1] Batsakis JG, Suarez P. Sarcomatoid carcinomas of upper aerodigestive tracts[J]. *Adv Anat Pathol*, 2000, 7(5): 282–293.
- [2] Leventon GS, Evans HL. Sarcomatoid squamous cell carcinoma of the mucous membranes of the head and neck: a clinicopathologic study of 20 cases[J]. *Cancer*, 1981, 48(4): 994–1003.
- [3] Barnes L. Spindle cell carcinoma, sarcomatoid carcinoma, carcinosarcoma. In: Barnes L, Editor. *Surgical pathology of the head and neck*, vol. 1, 3rd ed. New York (NY)7 Marcel Dekker, 2001, 174–181.
- [4] Viswanathan S, Rahman K, Pallavi S, et al. Sarcomatoid (Spindle Cell) Carcinoma of the Head and Neck Mucosal Region: A Clinicopathologic Review of 103 Cases from a Tertiary Referral Cancer Centre[J]. *Head Neck Pathol*, 2010, 4(4): 265–275.
- [5] Gupta R, Singh S, Hedau S, et al. Spindle cell carcinoma of head and neck: an immunohistochemical and molecular approach to its pathogenesis[J]. *J Clin Pathol*, 2007, 60(5): 472–475.
- [6] Munakata R, Cheng J, Nakajima T, et al. Spindle cell carcinoma of the gingiva: report of an autopsy case[J]. *J Oral Pathol Med*, 1998, 27(4): 180–184.
- [7] Takata T, Ito H, Ogawa I, et al. Spindle cell squamous carcinoma of the oral region: An immunohistochemical and ultrastructural study on the histogenesis and differential diagnosis with a clinicopathological analysis of six cases[J]. *Virchows Arch A Pathol Anat Histopathol*, 1991, 419(3): 177–182.
- [8] Thompson LD, Wieneke JA, Miettinen M, et al. Spindle cell (sarcomatoid) carcinomas of the larynx: a clinicopathologic study of 187 cases[J]. *Am J Surg Pathol*, 2002, 26(2): 153–170.
- [9] Rizzardi C, Frezzini C, Maglione M, et al. A look at the biology of spindle cell squamous carcinoma of the oral cavity: report of a case[J]. *J Oral Maxillofac Surg*, 2003, 61(2): 264–268.
- [10] Appelman HD, Oberman HA. Squamous cell carcinoma of the larynx with sarcoma-like stroma. A clinicopathologic assessment of spindle cell carcinoma and “pseudosarcoma”[J]. *Am J Clin Pathol*, 1965, 44: 135–145.