

## Primary Mucosal Desmoplastic Melanoma of Gingiva – A Case Report –

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Desmoplastic melanoma (DM) is a rare malignant melanoma variant. Although DM mainly affects the skin chronically exposed to the sun, a small number of mucosal DM have been reported. Primary mucosal DM is difficult to diagnose because of its rarity and atypical histopathologic features. Here, we report a case of DM in a 52 year-old female who presented with a right cervical mass and upper gingival pigmentation. A CT scan revealed an ill-defined infiltrative mass 2 cm in size under the pigmented mucosa. She subsequently underwent a partial maxillectomy with neck dissection. Gross examination revealed that the mass exhibited a grayish white fibrotic cut surface and that the maxillary bone had been destroyed. Microscopically, the main mass was composed of cigar-shaped or wavy spindle cells with desmoplastic stroma under the melanoma *in situ*. The diagnosis of DM was confirmed immunohistochemically with S100 protein positivity and HMB45 negativity. The patient has survived for 29 months after the operation with a presumed metastatic focus.

**Key Words** : Desmoplastic; Melanoma; Mouth mucosa

Desmoplastic melanoma (DM) is a rare malignant melanoma variant that was first described in 1971 by Conley *et al.*<sup>1</sup> This tumor mainly affects the skin chronically exposed to the sun and exhibits characteristic histopathologic features of amelanotic invasive spindle cells with dense fibrotic stroma. DM of the mucosa is rarer than cutaneous DM and fewer than 20 cases have been reported in the head and neck area.<sup>2</sup> In a small biopsy, if mucosal pigmentation or associated *in situ* component is not detected, DM may be confused with spindle cell malignancy such as fibrosarcoma, malignant peripheral nerve sheath tumor, sarcomatoid carcinomas, or even scar.<sup>3,4</sup> On the other hand, if a mucosal lesion is clearly detected, a submucosal spindle cell lesion with hypocellularity may easily be ignored. In this case, a mucosal desmoplastic melanoma exhibited features that were diagnosed as malignant melanoma *in situ* in a small biopsy specimen, but the diagnosis was subsequently revised to desmoplastic melanoma based on findings in the final surgical specimen.

### CASE REPORT

A 52-year old female came to our hospital with a one-year

history of a mass in the right cervical area and oral pain; she had previously been healthy. On physical examination, mucosal pigmentation (Fig. 1) was observed along the upper gingiva over the right first premolar extending to the second molar area. A CT scan of the neck revealed a 2 cm ill-defined firm mass with high signal intensity (Fig. 2) in the maxilla. A preoperative biopsy of the pigmented oral mucosa revealed atypical intraepithelial melanocytic proliferation and hypocellular spindle cell proliferation in lamina propria. This biopsy was interpreted as malignant melanoma *in situ*. For evaluation and treatment of the maxillary and cervical masses the patient received a right partial maxillectomy and modified radical neck dissection. Post-operative adjuvant therapy was not given, and she has survived for 29 months after the surgery with a presumed metastatic focus at the first lumbar vertebra; the melanoma has also recurred at the left upper gingiva.

Macroscopically, the excised specimen was an ill defined 1.6 cm grayish-white firm mass under the pigmented mucosal lesion that extended to the maxillary bone. The cut surface was homogeneously fibrotic without pigmentation, necrosis or hemorrhage (Fig. 3). Microscopically, the atypical intraepithelial melanocytic proliferation seen in the preoperative biopsy was detected in

the surgical specimen as well (Fig. 4). However, the predominant lesion proved to be the spindle cell proliferative lesion in the lamina propria. The submucosal lesion comprised hypercellular spindle cells with prominent fascicular to storiform patterning and fewer cellular zones with abundant stromal collagenation (Fig. 5). Nuclei were hyperchromatic and mildly pleomorphic. Most nuclei were slender, but some were cigar-shaped or wavy, resembling a neuroid feature. The observed mitotic rate was up to 2/10 high power fields (HPFs) within the hypercellular areas. The cytoplasm was pale, eosinophilic and fibrillary without recognizable pigments. The tumor infiltrated into the bone parenchyma, eliciting an osteolytic reaction. The spindle cells exhibited neurotropism and angiotropism at the tumor periphery (Fig. 6). The tumor involved the lateral resection margin and the left wall of nasal cavity.

The symptomatic cervical mass was an enlarged lymph node and three cervical lymph nodes were involved by non-pigmented spindle tumor cells. On immunohistochemical stainings, all

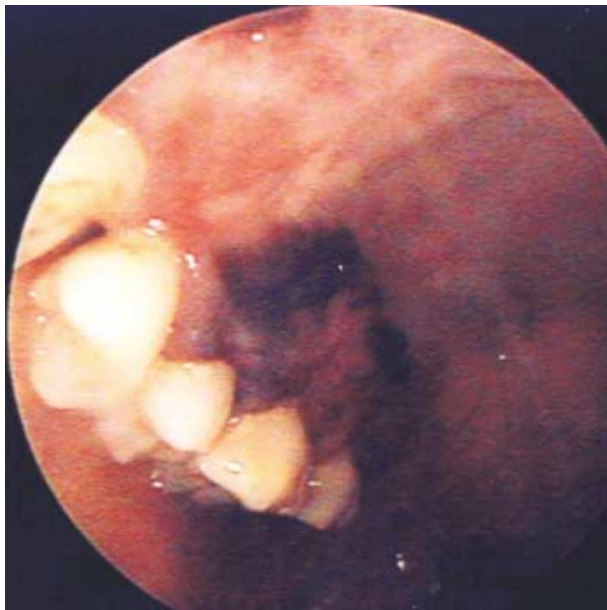


Fig. 1. Mucosal pigmentation is seen in the right upper gingiva and soft palate along the first premolar to second molar area.



Fig. 2. Computed tomography coronal view reveals a poorly circumscribed soft tissue mass involving the right maxillary alveolar ridge and sinus (arrow).

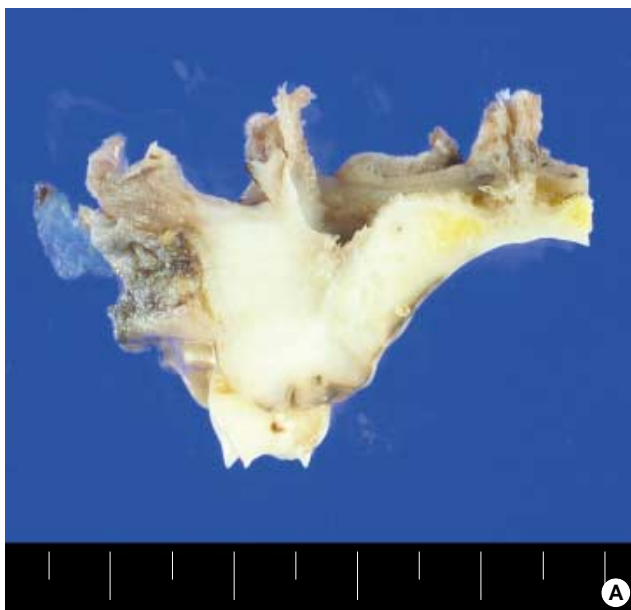


Fig. 3. On the gross examination (A) and 1:1 scanning (B), the tumor destroys the maxillary bone.

tumor cells in the mucosa, submucosa and metastatic lymph nodes were positive for S100 protein (1:500, Zymed, USA) and vimentin (1:200, Zymed, USA), and negative for HMB45 (1:50, DAKO), cytokeratin (AE1/AE3, 1:200, Zymed, USA) and smooth muscle actin (1:100, DiNonA, KOREA), as shown in Fig. 7.

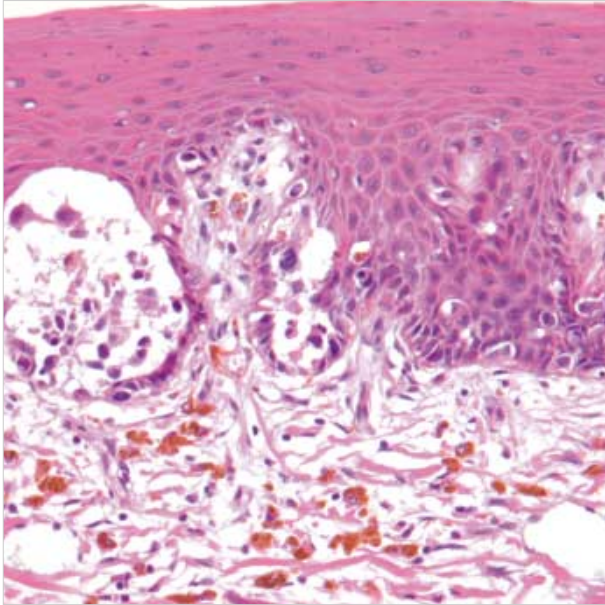


Fig. 4. The mucosal pigmented lesion is composed of atypical melanocytic proliferation with lentiginous pattern in the biopsy and surgical specimens ( $\times 200$ ).

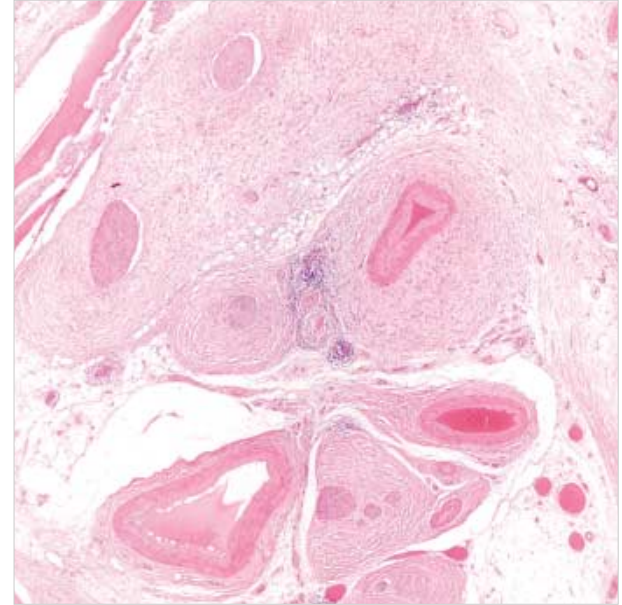


Fig. 6. Spindle cells with aggregation of lymphocytes can be seen wrapping around nerves and vessels ( $\times 100$ ).

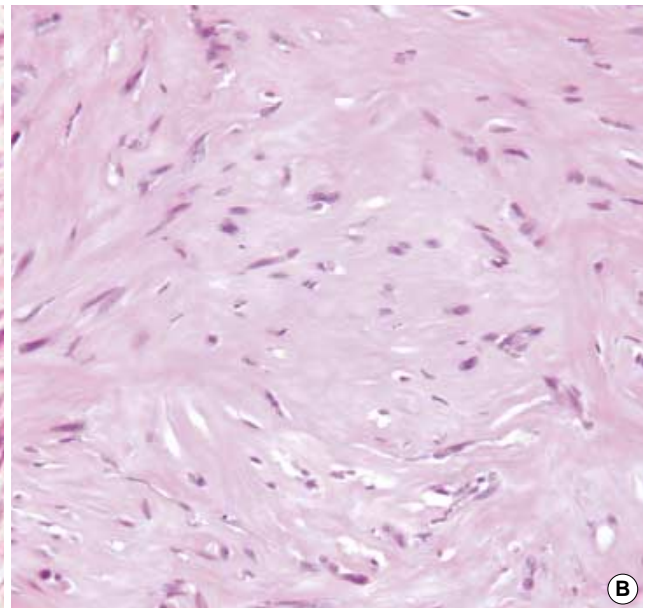
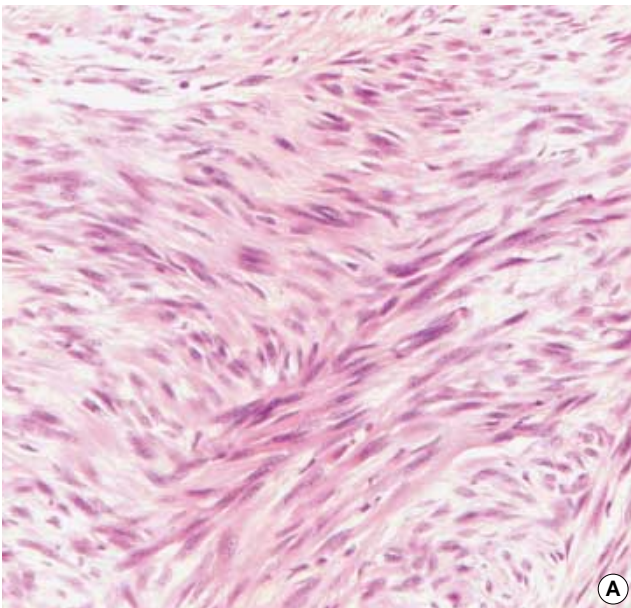


Fig. 5. The submucosal tumor shows hypercellular areas of spindle cell proliferation (A) and hypocellular zones with desmoplasia (B) ( $\times 400$ ).

## DISCUSSION

DMs are very rare, and only one other case has been reported in Korea, which was a cutaneous DM found on the left thigh of a 67-year old male.<sup>5</sup> Our case represents the first reported case of mucosal DM in Korea.

The head and neck are the most common sites for both cuta-

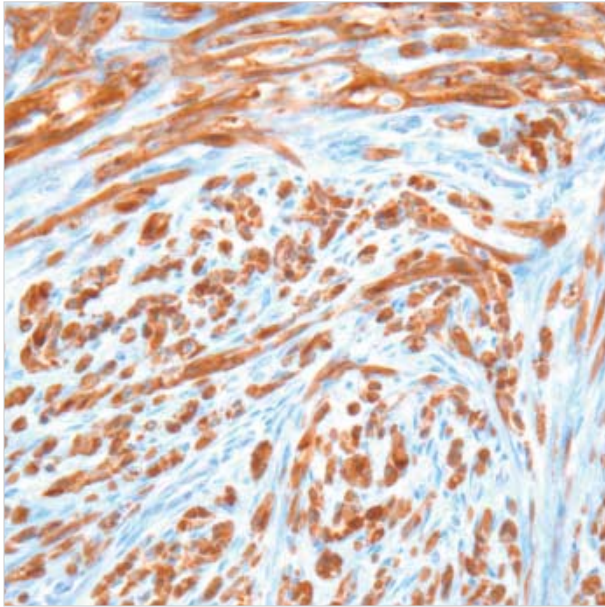


Fig. 7. On the immunohistochemical stainings the tumor cells are strongly positive for S100 protein ( $\times 400$ ).

neous and mucosal DMs, accounting for 59% of reported cases according to a review of a large AFIP study group.<sup>6</sup> Mucosal DM is much rarer than cutaneous DM, and only 15 cases of head and neck mucosal DM (excluding the lip) have been described.<sup>2,3,7-11</sup> In these 15 cases, the gingiva was the most common location (4 cases), followed by maxillary alveolus (3), buccal mucosa (2), maxillary mucosa (2), nasal vestibule (1), upper eyelid (1), palate (1), and oral cavity (1). The patients ranged from 23 to 81 years of age and were predominantly male. Of the 13 cases in which epithelial lesions were stated, 10 (92.3%) had melanoma *in situ*.

On the histologic examination, mucosal DM may be confused with a variety of non-melanotic spindle cell neoplasms such as fibromatosis, epulis fibromatosa, or malignant fibrous histiocytoma because of the lack of obvious pigmentation or other unknown reasons.<sup>3,9</sup> These lesions can usually be differentially diagnosed by morphology and proper immunohistochemistry. However, an immature scar may contain S100 protein-positive cells and mimic desmoplastic melanoma.<sup>12</sup> Therefore, any previous excision history is an important point for differential diagnosis. Conversely, when there is an obvious epithelial melanoma *in situ*, as in this case, the hypocellular amelanotic spindle cells with mild pleomorphism in the submucosal area tend to be overlooked. Neurotropism is a characteristic and diagnostic feature of DM with a reported incidence ranging from 16.7% to 82%.<sup>13-15</sup>

The results of immunohistochemical stainings of DM differ from those of conventional melanoma. In DM, S100 protein and vimentin are commonly expressed rather than the HMB45 mel-

noma-specific marker.<sup>16,17</sup> However, S100 protein expression in this neoplasm can be variable, and the absence of S100 protein staining should not be interpreted to exclude DM if the clinical and histologic features favor that diagnosis.<sup>18</sup>

In general, mucosal DMs tend to be thicker at the time of diagnosis and to present at a higher stage than cutaneous melanomas. So, a Breslow measurement of tumor thickness has more clinical importance than a Clark level in mucosal DM.<sup>2</sup> Our case exhibited a Clark level V with a 1.6 cm Breslow tumor thickness. In contrast to cutaneous melanomas in which local recurrences are rare and the probability of lymph node metastases is high, DM is characterized by a high incidence of local recurrence, a low incidence of lymph node metastases, and a propensity to develop systemic metastases. According to Jaroszewski *et al.*,<sup>19</sup> the high incidence of local recurrence after excision of the primary DM may originate from difficulties in making the clinical and pathological diagnosis, inadequate surgical excision, high Breslow thickness of the tumor at the time of diagnosis, and the neurotropic nature of the infiltration. Neurotropism has also been associated with disease progression of these tumors.<sup>4,8</sup>

Although DMs have a high incidence of local recurrence and a tendency to develop systemic metastases, the clinical outcome of DM is reported to surpass that of conventional melanomas when adjusted for stage and depth.<sup>6,20</sup> Unfortunately, our patient manifested an unusual example of regional lymph node metastasis; a local recurrence on the opposite side of the upper gingiva and a presumed systemic metastasis to the lumbar spine 29 months after the operation. The aggressive nature of the metastasis in our patient may be attributed to the difficulty in performing a curative resection due to the tumor position and the prominent angiotropism and neurotropism.

In summary, we report an uncommon mucosal DM in the oral cavity. This type of tumor is difficult to accurately diagnose and manage properly because of its rarity, unusual histology and the invasive nature. Epidermal proliferation of melanocytes, neurotropism and S100 protein positivity are the distinguishing features.

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