Myoepitheliomas of the Soft Palate: Helical CT Findings in Two Patients

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We describe the enhancement patterns of myoepithelioma in two patients with a soft palate mass. In the first case, helical CT revealed a faintly enhancing mass. Histologically, the tumor was composed of plasmacytoid cells in a background of rich myxoid stroma. Immunostaining for CD34 showed scanty blood vessels. In the second case, helical CT revealed an intensely enhancing mass. Histologically, the mass was a cellular tumor with fibrous stroma. Immunostaining for CD34 also showed frequent blood vessels.

Index terms:
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Myoepitheliomas are rare benign tumors that are composed entirely of myoepithelial cells. Myoepitheliomas account for less than 1% of all salivary gland tumors. Of all the salivary gland myoepitheliomas, 26% involve the minor salivary glands of the oral cavity, where the palate is the most common origin of intraoral myoepitheliomas (1–4). Since the establishment of a protocol for helical CT examinations of the neck, application of the protocol for head and neck tumors has been on the increase (1, 5–7). As well as the detection of the tumor, helical CT assists in the characterization of the tumor with optimization of the efficiency of contrast material application. In this report, we describe the enhancement patterns of myoepitheliomas of the soft palate using helical CT scans.

CASE REPORTS

Case 1

A 63-year-old man presented with a sensation of a foreign body in the throat for several years. A physical examination revealed an approximate 4 cm sized nontender, round, movable, pinkish mass originating from the posterior midline portion of the soft palate and uvula. There were no symptoms of dysphasia, dyspnea or sleep apnea. A helical CT (LightSpeed; GE Medical Systems, Milwaukee, WI) examination was performed. After administration of 90 mL of contrast material (Ultravist 370, Shering, Germany) into an antecubital vein at a rate of 3 mL/sec by use of a power injector, an early-phase helical scan was obtained with a scanning delay of 30 seconds. A delayed axial scan was obtained with a delay of 180 seconds. The CT number (in Hounsfield units, HU) of the tumor was measured by means of a circular region of interest (ROI). The ROI circle was made as large as possible within the tumor. An early phase axial CT showed a faintly enhancing (41 HU), 40 × 35 × 25 mm mass filling the orpharyngeal airway (Fig. 1A). A delayed axial CT showed further enhancement (65 HU) of the tumor with nodular enhancing portions (Fig. 1B). Under general anesthesia, the patient underwent tumor resection. The cut surface of the mass showed a lace-like appearance with multiple whitish nodules in a myxoid background. A microscopic

examination revealed that the tumor was composed of plasmacytoid cells, polygonal cells with eccentric nuclei and abundant hyaline eosinophilic cytoplasm, in the background of myxoid stroma (Fig. 1C). Immunostaining for CD34 showed scanty blood vessels (Fig. 1D). Immunohistochemical staining was positive for S-100 protein, cytokeratin, vimentin, and glial fibrillary acidic protein (GFAP). The tumor was consistent with a myoepithelioma.

Case 2

A 65-year-old woman presented with dysphasia due to a slowly growing intraoral mass for four years. This mass showed rapid enlargement during the most recent month. The patient had painless odynophagia, dysphasia, and voice change. A physical examination revealed an approximate 4 cm sized pinkish tumor located on the left side of the soft palate. A helical CT (HiSpeed Advantage; GE Medical Systems) examination was performed. After administration of 90 mL of contrast material (Ultravist370 into an antecubital vein at a rate of 3mL/sec by use of a power injector, an early-phase helical scan was obtained with a scanning delay of 30 seconds. A delayed axial scan was obtained with a delay of 180 seconds. An early phase coronal CT showed intensely enhancing (215 HU), 32 × 31 × 26 mm tumor originating from the left posterior portion of the soft palate and protruding toward the orpharyngeal airway (Fig. 2A). A delayed axial CT showed persistent homogenous prominent enhancement (138 HU) of the tumor, although the degree of enhancement was decreased in comparison to the early phase helical CT scan (Fig. 2B). Under general anesthesia, the patient underwent tumor resection. The cut surface of the mass showed a grayish white firm tumor. A microscopic examination revealed that the tumor was cellular and composed of spindle cells, which were arranged in fascicles (Fig. 2C). A duct or chondroid matrix was not observed within the tumor. The mitotic figure was 1–2/10 high-power fields.

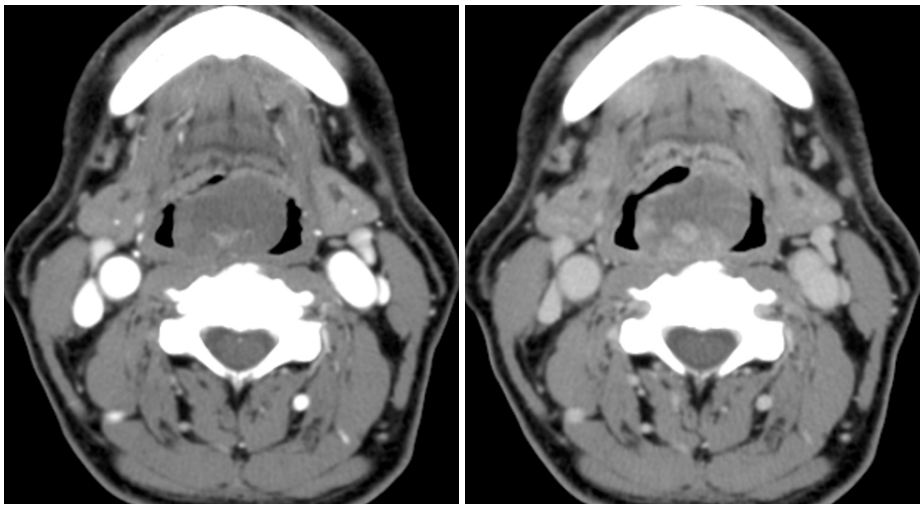

Fig. 1. Case 1. **A.** An early phase axial CT scan shows a well-demarcated soft palate tumor showing faint enhancement.
B. A delayed axial CT scan shows heterogenous, nodular enhancement of the tumor.
C. A microscopic view (Hematoxylin & Eosin staining ×400) of the myoepithelioma shows plasmacytoid cells in the background of myxoid stroma.
D. Immunostaining for CD34 (×400) shows scanty blood vessels.

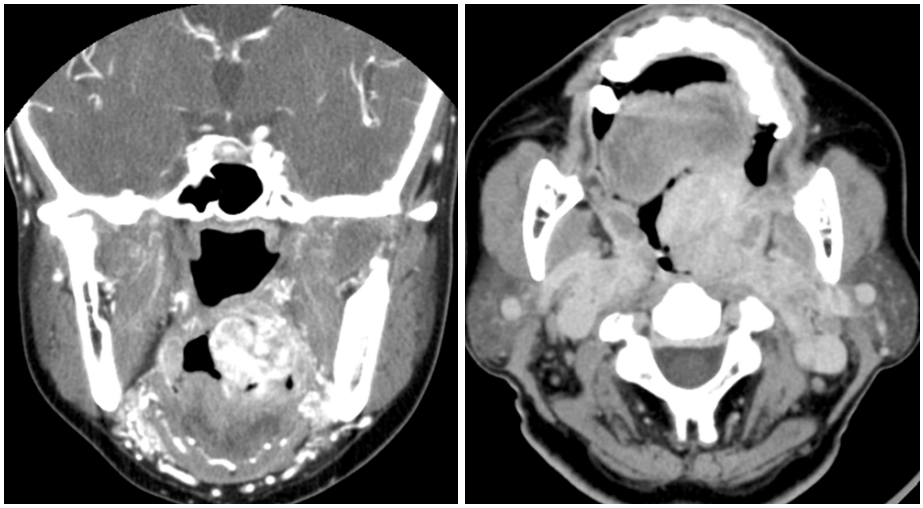

Fig. 2. Case 2. **A.** An early phase coronal CT scan shows an intensely enhancing soft palate tumor.
B. A delayed axial CT scan shows persistent homogenous enhancement of the tumor.
C. A microscopic view (Hematoxylin & Eosin staining ×400) of the myoepithelioma shows a cellular tumor composed of spindle cells.
D. Immunostaining for CD34 (×400) shows frequent blood vessels.

The stalk of the tumor was free of tumor. Immunostaining for CD34 showed frequent blood vessels (Fig. 2D). Immunohistochemical staining was positive for S-100 protein, cytokeratin, vimentin, and GFAP. The tumor was consistent with a myoepithelioma.

DISCUSSION

Palatal masses comprise salivary gland tumors, neurinomas, hemangiomas, malignant tumors originating from the oral mucosa, metastatic tumors, and inflammatory diseases (2). The soft palate is the most common site of minor salivary gland tumors (MSGT). MSGT comprise 2–3% of all malignancies of the extracranial head and neck. Benign tumors comprise approximately 50% of the MSGT (8).

Myoepitheliomas show several cellular patterns of spindle cells, plasmacytoid cells, epithelioid cells, and clear cell patterns. Plasmacytoid cell tumors tend to occur more frequently in the oral cavity, whereas spindle cell types have been reported to occur in the parotid gland (3). The cell type is unrelated to differences in the biological behavior, recurrence rate, or the patient age (4). A biopsy is needed for diagnosis of a myoepithelioma, as radiological differentiation of myoepitheliomas from other salivary gland tumors, such as pleomorphic adenoma, is difficult. The distinction is important because myoepitheliomas can show a somewhat aggressive growth more than a pleomorphic adenoma (2).

Pleomorphic adenomas evaluated with two-phase helical CT show an increase in enhancement at delayed phase in 75% of the cases. A mixed pattern of attenuation change between early and delayed phase scanning and multinodular enhancement are found in pleomorphic adenomas. The rapid scanning of helical CT with an injection of a bolus of contrast material provides a basis for the evaluation of the enhancement patterns of salivary gland tumors (6). Three

previously reported cases of myoepitheliomas evaluated with helical CT showed various enhancement patterns: faint enhancement (2), no significant attenuation change between early and delayed phase scanning (6), and high vascularity (1).

Many biological factors influence the enhancement patterns of tumors. Vascularity, histopathological cell types, and histological components of the tumors are the important biologic factors for tumor enhancement (5). A benign myoepithelioma of the spindle cell type with areas of hyalinization (2) and a myoepithelioma of the plasmacytoid cell type with myxoid stroma described here show faint enhancement. The myoepithelioma of the spindle cell type with fibrous stroma described here shows intense enhancement. This suggests that the histological component, the stroma, may affect the enhancement patterns of myoepitheliomas. Cellular myoepitheliomas with fibrous stroma have more vascularity and enhancement than those with rich myxoid stroma.

Scanning parameters also influence the enhancement patterns of the tumors. Helical CT assists in the evaluation of vascularity and the enhancement patterns of head and neck tumors (6). Rapid scanning of helical CT with injection of a bolus of contrast material gives an optimal efficiency of contrast material application, thus providing better vascular enhancement than conventional CT with a slow-drip infusion of contrast material. The major arteries show maximum enhancement at 30 seconds after contrast injection using helical CT (5, 6).

Some reports have described the application of helical CT for salivary gland tumors. The solid subtype basal cell adenoma of the parotid gland shows strong enhancement on early phase scans (113 HU $\pm$ 37 at 30 seconds, 87 HU $\pm$ 8 at 120 seconds) (7). Pleomorphic adenomas show a delayed enhancement (66 HU $\pm$ 24 at 30 seconds, 82 HU $\pm$ 20 at 120 seconds). Warthin tumors show strong enhancement on the early phase of scans (96 HU $\pm$ 22 at 30 seconds, 77 HU $\pm$ 10 at 120 seconds). Malignant tumors show an increase in attenuation on delayed scans (78 HU $\pm$ 22 at 30 seconds, 88 HU $\pm$ 18 at 120 seconds) (6). In terms of the CT enhancement pattern of a myoepithelioma, a case of benign myoepithelioma of the hard palate shows faint contrast enhancement. Histologically, this tumor shows compact proliferation of spindle cells with areas of hyalinization (2). A case of myoepithelial carcinoma showed a similar HU both on early and delayed phase scans (76 HU at 30 seconds, 79 HU at 120 seconds) (6). A case of malignant giant myoepithelioma of the face showed high vascularity on a helical CT scan (1).

Analysis of the enhancement patterns of multiphasic CT images may help in the differential diagnosis of a slow-growing well-demarcated mass of the soft palate. Multiphasic CT for a myoepithelioma shows various enhancement patterns characterized by the histological subtype.

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