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Radiotherapy as a First-Line Modality for Tongue Base Adenoid Cystic Carcinoma : Report of 3 Cases

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설근부에 발생한 샘낭암종의 방사선치료 : 증례보고 3예

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= 국문초록 =

주로 작은 침샘에서 발생하는 샘낭암종의 치료 방침은 수술과 수술 후 보조적 방사선치료가 주로 행해져 왔다. 그러나 설근부에 발생한 샘낭암종에 대해서는 수술적 치료가 가져오는 삶의 질의 저하가 크기 때문에 수술적 치료를 적용하기 쉽지 않다. 또한 샘낭암종의 치료에 있어서 항암제의 역할이 거의 없는 상황에서 방사선치료가 중요한 역할을 할 수 있겠다. 이에 본 저자들은 설근부에 발생한 샘낭암종 세 증례의 방사선치료 결과를 보고 하며 샘낭암종의 치료에 대해서 문헌고찰을 통해 논의하고자 한다.

중심 단어 : 샘낭암종 · 방사선 치료.

Introduction

Adenoid cystic carcinoma(ACC) is a rare malignancy usually presenting in the minor salivary glands.[1)] Because it can occur wherever minor salivary glands exist, 40% of cases arise in other head and neck sites such as the oral cavity, principally, other than major salivary glands.[1)] The relative indolent course of the disease and the propensity for perineural extension are well known characteristics, however, exact biological properties are poorly understood.[1-4)] In the management of ACC, surgical excision is generally recommended first. Radiotherapy has been applied postoperatively or to the patients with inoperable disease state while chemotherapy is reserved for the palliative setting in general.[5-8)] However, treatment options should be diversely considered according to the disease site, functional outcome, and especially the long survival time of such patients.

We report 3 consecutive cases of adenoid cystic carcinoma occurring in the base of tongue treated with radiation therapy alone.

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Case Report

1. Patient A

A 79 year old women presented with a protruding tongue base mass that nearly obstructed the oropharynx. With inci-

sional biopsy, the mass was diagnosed as ACC with a predominantly cribriform pattern(Fig. 1). On computed tomography(CT) and magnetic resonance(MR) images, a 3×4.5 cm-sized well circumscribed enhancing mass was located in the tongue base. On the initial fluorine-18 fluorodeoxyglucose(F-18 FDG) positron emission tomography(PET)/CT images, intense FDG uptake[standardized uptake value(SUV) 9.38] was measured in the tongue base mass and no significantly enlarged lymph node was observed. Several factors were discussed at our multidisciplinary tumor board for treatment decision-making, including the patient's old age, which may cause difficulty in enduring the surgical procedure and result in poor functional outcomes, and the large mass filling the oropharynx which may stand as an obstacle during intubation. With these considerations, the patient was planned for radiation therapy alone.

Radiotherapy was delivered with 67.5 Gy to the primary mass. 54 Gy was delivered to the primary mass+1.0 cm margin for suspicious microscopic disease by 30 fractions with volumetric arc radiation therapy technique(VMRT)(Fig. 2). During the radiotherapy the patients developed grade 3 mucositis however ; planned treatment was delivered. After treatment, regular follow up based on the clinical examination and image modalities were performed. At 11 months after completion of radiotherapy, PET/MR imaging revealed that the mass was reduced to 1.5×2 cm with a SUV uptake reduced to 3.1 and no other metastatic lesion was detected. At the last follow up of 20 months, clinical examination revealed no mucosal lesion and MR image showed further decreased mass to 1.0×1.9 cm, resulting in a state of partial response(PR)(Fig. 3). The patients complained of nothing but decreased taste.

2. Patient B

A 57-year old previously healthy women presented with tongue bleeding and dysarthria. Symptoms persisted for about 9 months before visiting the hospital. On laryngoscope examination, the tongue was deviated to the left with atrophy and an indurated mass in the tongue bass. Punch biopsy was performed. Pathologic examination reported that the mass was ACC with predominantly tubular pattern. On CT and MR images, a 3.7 cm-sized, infiltrating, and enhancing mass involving the tongue with invasion of extrinsic muscles was observed with no abnormal cervical LN enlargement. PET/CT revealed that beside the hypermetabolic lesion in the tongue, both palatine tonsils and posterior buccal mucosa also had hypermetabolic activity, suggesting infiltration of cancer. No other metastatic lesion was suggested. Considering the infiltrative characteristic of the disease, the potential for systemic dissemination, and the patient's reluctance to total laryngectomy, concurrent chemoradiation was decided on at our multidisciplinary tumor board discussion.

Six cycles of weekly cisplatin(35 mg/m^2) were delivered concurrently with radiation. The total tongue, both tonsils, and posterior buccal mucosa showing hypermetabolism on PET/CT images received 67.5 Gy. Considering the advanced state

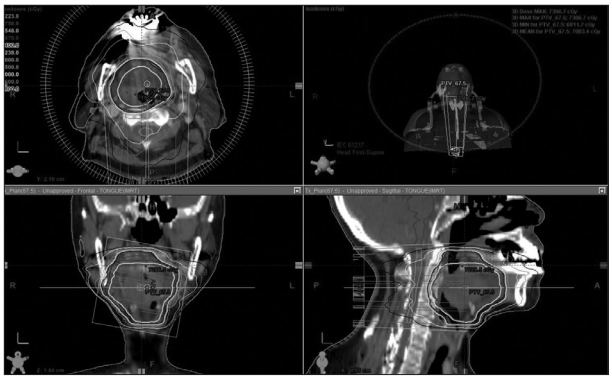

Fig. 2. Dose distribution of radiotherapy of patient A. Radiotherapy was delivered with 67.5 Gy to the primary mass. 54 Gy was delivered to the primary mass+1.0 cm margin for suspicious microscopic disease by 30 fractions with volumetric arc radiation therapy technique(VMRT).

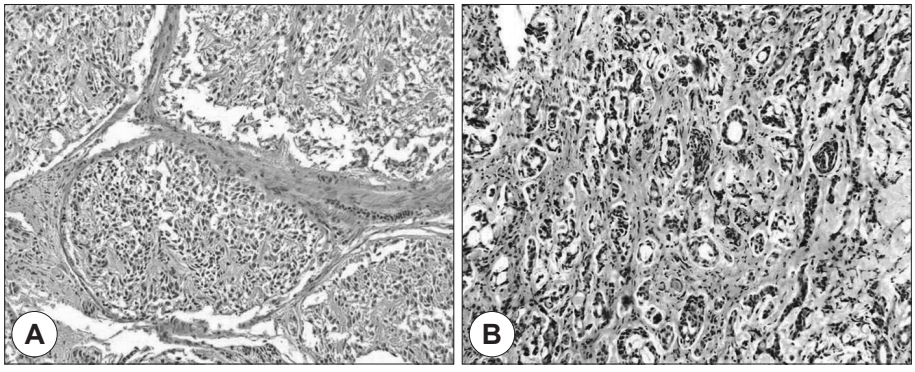

Fig. 1. Pathologic images of patients. A : Pathology of the patient A-Cribriform growth pattern of ACC, H&E staining ×200. B : Pathology of the patient B-Tubular growth pattern of ACC, H&E staining ×200 ; Pathology image of patient C was not available.

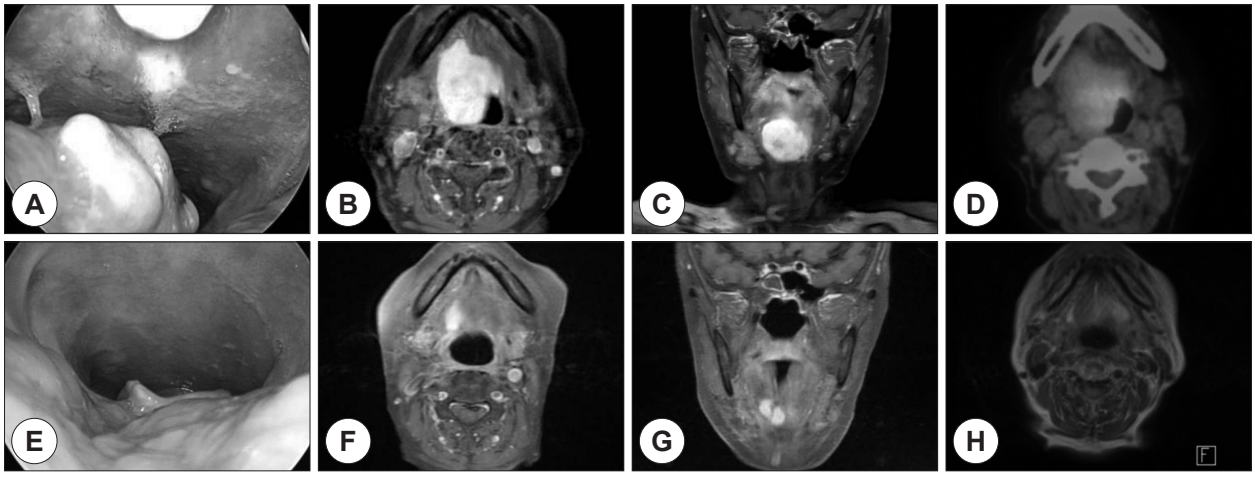

Fig. 3. Laryngoscopic, MR, PET/CT and PET/MR images of patient A. Laryngoscopic image(A),T1 contrast axial(B) and coronal image (C) and PET/CT image(D) before treatment showed 3×4.5 cm sized tongue base mass with hypermetabolism(SUV 9.38). Laryngoscopic image at 11 months after treatment(E) showed no mucosal lesion. T1 contrast axial(F) and coronal image(G) at 20 months after radiotherapy demonstrated reduced size of tongue base mass to 1.0×1.9 cm. PET/MR image(H) at 11months after radiotherapy showed reduced hypermetaboism(SUV 3.1).

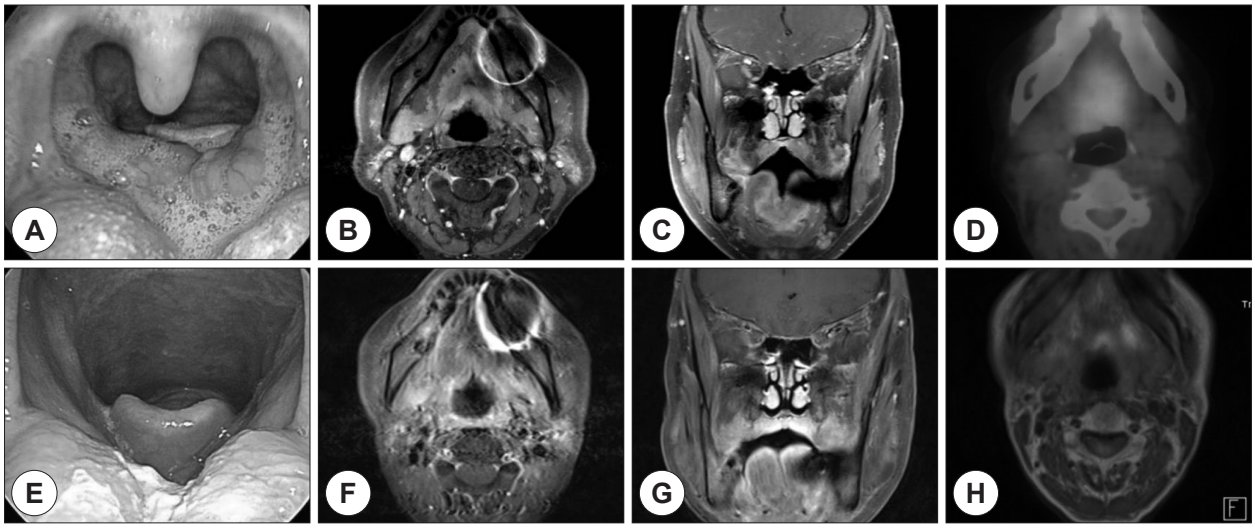

Fig. 4. Laryngoscopic, MR, PET/CT and PET/MR images of patient B. Laryngoscopic image(A), T1 axial/coronal contrast-enhanced image(B and C) and PET/CT(D) image before treatment showed 3.7 cm-sized tongue base mass with hypermetabolism. Laryngoscopic image(E) at 9 months after treatment showed no abnormal lesion. T1 axial/coronal contrast-enhanced image(F and G) and PET/MR(H) image at 11 months after radiotherapy showed no abnormal or hypermetabolic lesion.

of the disease, 54 Gy was delivered to the bilateral parapharyngeal spaces, lymph node level IB, II and III. Using VMAT, radiation dose was delivered through 30 fractions. The patient received all planned radiation and chemotherapy doses, but developed grade 3 mucositis at the end of treatment.

Complete response was observed by neck MRI after 6 months of treatments. The patient was in a state of complete response(CR) at the last follow up of 11 months by PET/MR image, showing no abnormal hypermetabolic activity except for a focal hypermetabolism on the left floor of mouth that most likely was caused by inflammation from a dental metal crown(Fig. 4).

3. Patient C

A 68 year old man complaining of dry mouth presented with a tongue base mass with soft palate immobilization. The mass was diagnosed as ACC with predominantly cribriform growth. On CT and MR images, the mass was characterized as a 3.8 cm-sized mass involving the genioglossus. Indeterminately small lymph nodes in the left level I area was detected. On PET/CT scans, no other FDG uptakes were noticed except at the tongue base mass with a SUV of 4.8. The patient was suffering from cervical spondylosis with limited neck extension that could cause intra-oral surgical procedures to be difficult, and preferred radiotherapy than surgery. Considering these factors, radiation therapy was decided at our mul-

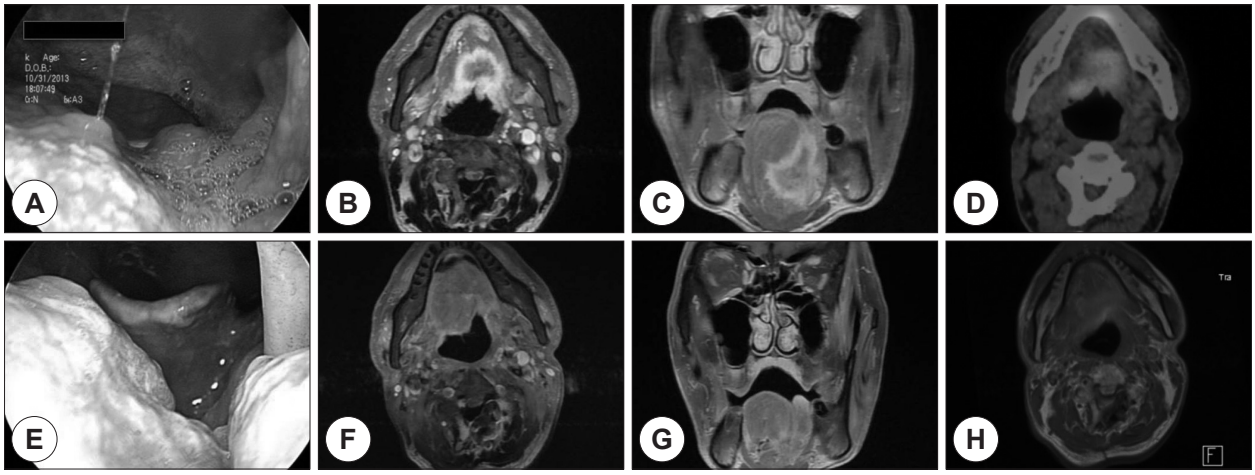

Fig. 5. Laryngoscopic, MR, PET/CT and PET/MR images of patient C. Laryngoscopic image(A), T1 contrast-enhance axial/coronal images(B and C) and PET/CT image(D) before treatment showed 3.8 cm-sized tongue base mass with hypermetabolism(SUV 4.8). Laryngoscopic image(E) at 10 month after treatment showed residual mass. T1 contrast-enhance axial/coronal images(F and G) after 10 month of treatment showed reduced mass to 2.3 cm. PET/CT image(H) after 5 months of treatment showing reduced hypermetabolism(SUV 4.0).

tidisciplinary institutional tumor board.

A total of 72 Gy/30 Fx to the tongue bass mass and considering indeterminate small lymph nodes detected on the imaging study, 54 Gy to the bilateral level I and II lymph node areas including the skull base, were delivered. Grade 2 mucositis developed at the end of radiotherapy. On PET/MR imaging taken 5 months after the treatment, the mass was reduced to 2.3 cm and SUV value was 4.0 and no other metastatic lesion, making it a PR. At the last follow up of 10 months, the patient complained of minimal dry mouth with no palpable lesion on the neck, but residual mass on the tongue base.MR images revealed a sustained reduced mass(Fig. 5).

Discussion

Here, we report 3 patients with ACC in the tongue base treated with radiation therapy. All three patients showed partial or complete response and maintained its efficacy until 10 to 20 months.

The mainstay of treatment for minor salivary gland cancer is surgery with or without postoperative radiation ; however, radiation alone as a primary treatment has been done for inoperable diseases.[5,9-11] Considering the delayed occurrence of distant metastasis and a relatively long survival time even after distant metastasis occurs for patients with ACC[4,12] treatments causing deterioration of functional outcome should be carefully applied.

Disappointingly, radiation therapy(photon) alone resulted in low local control rates(5-year local control rates$<$50%) in general[5-7] and the patients treated without surgery had poor prognosis.[1] However, these reports reflected inoperable advanced stage of the disease. Parsons et al. reported good local control especially for early T stage lesions.[5] Moreover, there exists a subgroup with favorable prognostic factors.[3,12-15] It is well known that cribriform or tubular growth pattern had good prognosis than solid growth pattern.[3,12,13] Involvement of the base of skull and lymph node were poor prognostic factors for cause-specific survival[14] and the involvement of named nerves were also associated with risk of local relapse.[15] All three patients presented in this report had low-risk cribriform or tubular growth pattern, no involvement of the base of skull, negative lymph nodes, and no involvement of named nerves. Recently, prognostic factors based on genetic and molecular study are actively under investigation.[16-18] However, in the clinical application of these studies, further investigation is encouraged.

To enhance locoregional control rates, trials for the effective treatment to inoperable patients had been conducted. Several studies reported the role of concurrent chemoradiation therapy(CCRT) for salivary gland cancer including ACC.[19] Although a small retrospective studies, ACC patients treated with CCRT showed good responses.[20,21] In our study, we report complete response of the patient B treated with radiation concurrently with cisplatin ; however, the role of adding chemotherapy in the radiation treatment of ACC should be clarified in the large-scale studies.

In conclusion, we report three cases showing partial or complete response to the radiotherapy of ACC arising in the tongue base and sustaining its efficacy to 10 to 20 months. In cases when surgical treatment could deteriorate functional outcome

due to the location of the disease, radiotherapy could be a reasonable option as a first-line modality for the treatment of ACC without high-risk features, leaving open the possibility of salvage surgery in case of local progression.

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