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Case Report

Airway management in a patient with a deep neck abscess and tortuous brachiocephalic artery: Case report and review of the literature



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ABSTRACT

Endotracheal intubation and tracheotomy under local anesthesia are available methods to maintain an adequate airway in patients with deep neck abscess; but neither of them is easy to perform. We report a case of deep neck abscess with a tortuous brachiocephalic artery in which massive hemorrhage from the pharynx occurred during endotracheal intubation. A 79-year-old man presented to our department with cervical swelling, hoarseness, and difficulty in swallowing. CT scans revealed abscesses associated with gas in the left submandibular space, left parapharyngeal space, and bilateral anterior cervical space. The brachiocephalic artery ran horizontally immediately beneath the thyroid gland on the anterior surface of the trachea. We decided to perform surgery under general anesthesia. Endotracheal intubation was selected to maintain an adequate airway, because tracheotomy was considered to be risky due to the high location of the brachiocephalic artery. Hemorrhage from the pharynx occurred immediately after insertion of a tracheal tube into the pharyngeal cavity. Bleeding was controlled by packing the pharyngeal cavity with gauze, after which the tube could be advanced into the trachea. Incisional drainage of the abscesses and debridement of necrotic tissue were performed. The patient was discharged from hospital 63 days postoperatively.

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1. Introduction

Airway control is the most important consideration in the treatment of deep neck abscess. Tracheotomy under local anesthesia is generally considered to be the gold standard for airway maintenance in patients with deep neck abscess [1,2], because intubation is often difficult due to trismus, tracheal deviation, and airway narrowing. Although tracheotomy is usually a relatively simple surgical procedure, tracheotomy under local anesthesia in patients with deep neck abscess is neither easy nor safe [3,4]. While it is rare, a tortuous brachiocephalic artery may be located high on the

anterior surface of the trachea [5–10], and tracheotomy may cause fatal bleeding due to vascular injury in such patients. Here, we report a patient with a deep neck abscess and tortuous brachiocephalic artery in whom pharyngeal hemorrhage occurred during endotracheal intubation.

2. Case report

In June 2012, a 79-year-old man was referred to our department with swelling of the cervical region, a hoarse voice, and difficulty in swallowing. He had a past history of hypertension and diabetes, while the family history was unremarkable. His left mandibular second molar became painful from 12 days before attending our department. The patient presented to another hospital with left cervical swelling 5 days earlier, and dysphagia developed on the next day. At the other hospital, CT scanning revealed an abscess with gas in the left cervical region. A diagnosis of deep neck abscess was made and the patient was hospitalized on the same day for intravenous antimicrobial therapy. Surgery was not performed.

* Asian AOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

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Subsequently, left cervical swelling spread to involve the anterior cervical region, and the patient was referred to our department. Initial physical examination revealed that his height was 155 cm, weight was 53 kg, and temperature was 37.1 °C. His consciousness was clear. SpO₂ was 95% (on room air) and the respiration rate was 25 min⁻¹. His voice was hoarse and mild dyspnea was noted, but he could lie on his back without distress. Swelling and redness extended from the left submandibular region to the submental and bilateral anterior cervical regions (Fig. 1). Pulsations

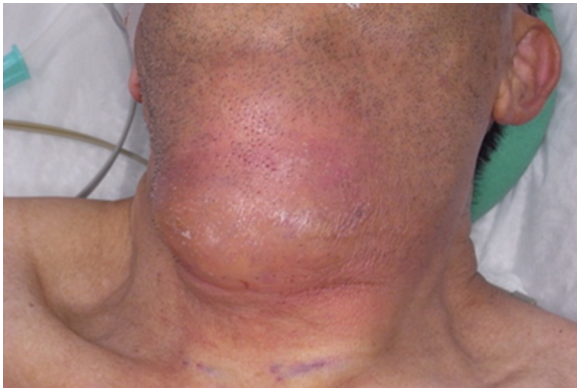


Fig. 1. Findings on referral to our hospital. Swelling and redness extend from the left submandibular region to the submental and anterior cervical regions. Pulsations were palpable above the suprasternal notch.

were palpable above the suprasternal notch. Examination of the oral cavity revealed swelling of the left floor of the mouth and the soft palate. The range of mouth opening was 35 mm between the maxillary and mandibular central incisors. Table 1 shows the results of hematology tests. Panoramic radiography displayed a radiolucent area at the apex of the left mandibular second molar. CT scanning revealed an abscess associated with gas that involved the left submandibular space, left parapharyngeal space, and bilateral anterior cervical spaces as far as the level of the thyroid gland (Fig. 2). The brachiocephalic artery was tortuous, running transversely on the anterior surface of the trachea immediately below the thyroid gland (Figs. 3 and 4). With a diagnosis of deep neck abscess due to caries of the left mandibular second molar, he was admitted immediately for surgery under general anesthesia. When we considered whether to employ endotracheal intubation or tracheotomy with local anesthesia to maintain the airway, it was feared that the tortuous brachiocephalic artery running

Table 1
Laboratory data at the first examination.

Variable	Result
WBC ($\times 10^3/\mu\text{L}$)	8.2
RBC ($\times 10^6/\mu\text{L}$)	3.64
PLT ($\times 10^3/\mu\text{L}$)	227
TP (g/dL)	6.0
Alb (g/dL)	2.2
Na (mEq/dL)	143
K (mEq/dL)	3.6
Cl (mEq/dL)	108
BUN (mg/dL)	23
Crea (mg/dL)	0.56
AST (U/L)	36
ALT (U/L)	43
CRP (mg/dL)	20.4
P-Glu (mg/dL)	140
HbA1c (%)	6.1
PT (sec)	15.0
PT-INR (sec)	1.44
APTT (sec)	33

transversely below the thyroid gland would be injured by tracheotomy, and formation of a tracheo-brachiocephalic artery fistula would subsequently occur. Furthermore, because the abscess extended to the level of the thyroid gland, performing tracheotomy would cut into the abscess cavity. Since trismus was mild and the larynx could be expanded, it was decided to secure the airway by awake oral intubation following preparation for emergency tracheotomy after consultation with an anesthesiologist. The glottis could be identified when the larynx was expanded using a laryngoscope. However, hemorrhage occurred simultaneously with the pharyngeal reflex immediately after the tube was inserted into the pharynx. Despite suction with an aspirator, the bleeding point could not be identified because of profuse hemorrhage. Therefore, the left pharyngeal cavity was packed with gauze, after which the volume of bleeding decreased and intubation could be completed. Sedation was induced immediately, more gauze was packed into the pharyngeal region, and hemostasis was achieved by compression. Subsequently, perforation of the left pharyngeal mucosa was identified (Fig. 5). An incision was made in the cervical region and the skin flap was dissected. The muscle tissue showed extensive necrosis spreading from the left cervical region to the right anterior cervical region (Fig. 6). Necrotic tissue was removed by debridement, and a Penrose drain was placed. The left lower second molar was extracted. Meropenem trihydrate (MEPM) was administered at a dose of 1.5 g/day for 13 days after surgery and lavage was

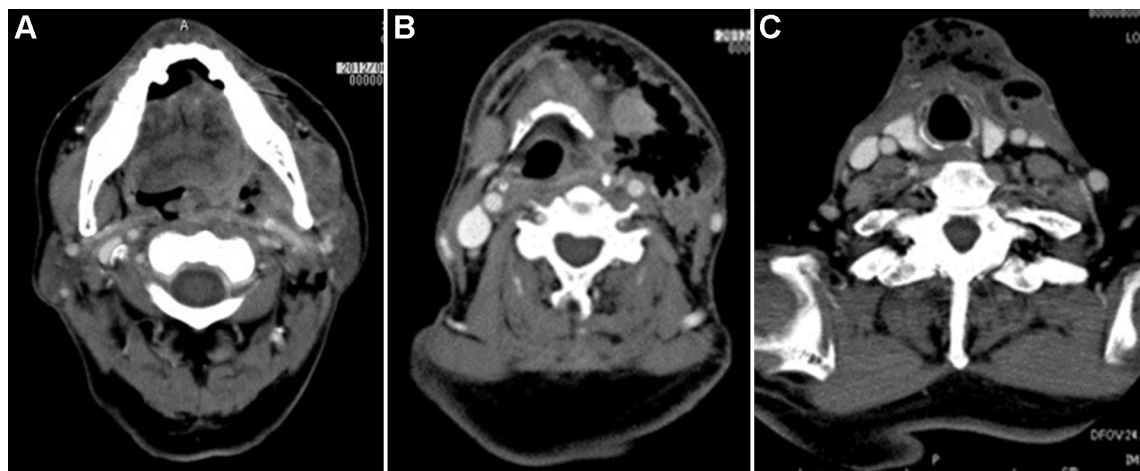


Fig. 2. Initial CT findings at our hospital. (A) Abscess in the left parapharyngeal space. (B) Abscess in the left submandibular space. (C) The abscess extends to the level of the thyroid gland in the anterior cervical region.

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