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Case report

Cervical necrotizing fasciitis of odontogenic origin in a healthy young patient without pre-systemic disorders

Masanobu Abe^{a,b,*}, Takahiro Abe^{a,1}, Ritsuka Mogi^a, Hiroyuki Kamimoto^a,
Noriko Hatano^a, Asako Taniguchi^a, Hideto Saijo^a, Kazuto Hoshi^a, Tsuyoshi Takato^a

^a Department of Oral & Maxillofacial Surgery, University of Tokyo Hospital, Tokyo, Japan

^b Division for Health Service Promotion, University of Tokyo, Tokyo, Japan

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ABSTRACT

Necrotizing fasciitis (NF) is a rapidly spreading soft-tissue infection characterized by diffuse necrosis of fasciae and subcutaneous tissues. Cervical NF (CNF) can develop from odontogenic infections that spread to the deep fascial planes of the neck. This polymicrobial infection is rapidly progressive, destructive, and often fatal. The majority of CNF patients are known to present an immunosuppressed status or to have systemic disease. CNF is uncommon in healthy individuals. Here we describe the case of a patient with CNF due to an odontogenic polymicrobial infection including *Streptococcus milleri* group (*S. milleri*) after extraction of the mandibular third molar in a healthy 32-year-old Thai man. The CNF progressed to descending mediastinitis, which often leads to a poor prognosis and decreased survival. Prompt diagnosis, intensive antibiotic therapy and repeated surgical treatment successfully contributed to the survival of this patient. His case suggests the importance of perioperative care for invasive dental treatments in not only patients with pre-systemic disorders but also healthy young individuals.

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Introduction

Cervical necrotizing fasciitis (CNF) patients commonly present with fever, tachycardia, and dehydration, and sometimes with swallowing difficulty and trismus. The skin frequently presents as hard and erythematous, and in the most severe cases the skin can present wide tissue necrosis. A polymicrobial infection of aerobes and anaerobes is involved in CNF. The most frequent primary origin of CNF is reported to be odontogenic infection [1–4].

The incidence of necrotizing fasciitis (NF) is known to be much higher in immunosuppressed patients and individuals with diabetes mellitus, cancer, or cardiovascular insufficiency, transplanted patients, etc. [5]. Surgical procedures such as extraction of the teeth occasionally lead to CNF in immunosuppressed patients. The outcomes of CNF patients are quite adversely affected by comorbidities. Advanced age and a delay in surgery also affect the outcomes of CNF patients. CNF in healthy young individuals without pre-systemic disorders are quite uncommon [5].

Here we describe a rare case of CNF due to an odontogenic infection in a healthy young man, and we discuss this enigmatic situation. We also emphasize the importance of perioperative infectious control for oral surgical procedures.

Case report

A 32 year-old Thai male with no history of pre-systemic disorders was initially treated in a dental office for a lower third molar removal (Fig. 1a). Cefditoren pivoxil (CDTR-PI, 100 mg) every 8 h was used after extraction of the third molar. The doctor in the dental office said that the oral hygiene quality of this patient was poor and the gingiva around the third molar was swelling. Two days after the procedure, his body temperature increased to 40 °C and he experienced trismus and facial erythema at the right submandibular region (Fig. 1b). His social history was negative for tobacco and alcohol.

At admission, he was febrile, hypertensive (161/80 mmHg), and dehydrated because he had not taken any liquids for the past 36 h. A hemogram revealed a white cell count of $8.3 \times 10^3/\mu\text{L}$, with 79.8% neutrophils. The inflammatory response (C-reactive protein; CRP) was increased (29 mg/dL). Enhanced computed tomography (CT) scanning revealed extensive abscesses and/or accumulation of gas in the right deep cervical region (Fig. 2a). Abscesses and/or gas were

* Corresponding author at: Division for Health Service Promotion, University of Tokyo Hospital, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan.

E-mail address: abem-ora@h.u-tokyo.ac.jp (M. Abe).

¹ These authors equally contributed to this work.

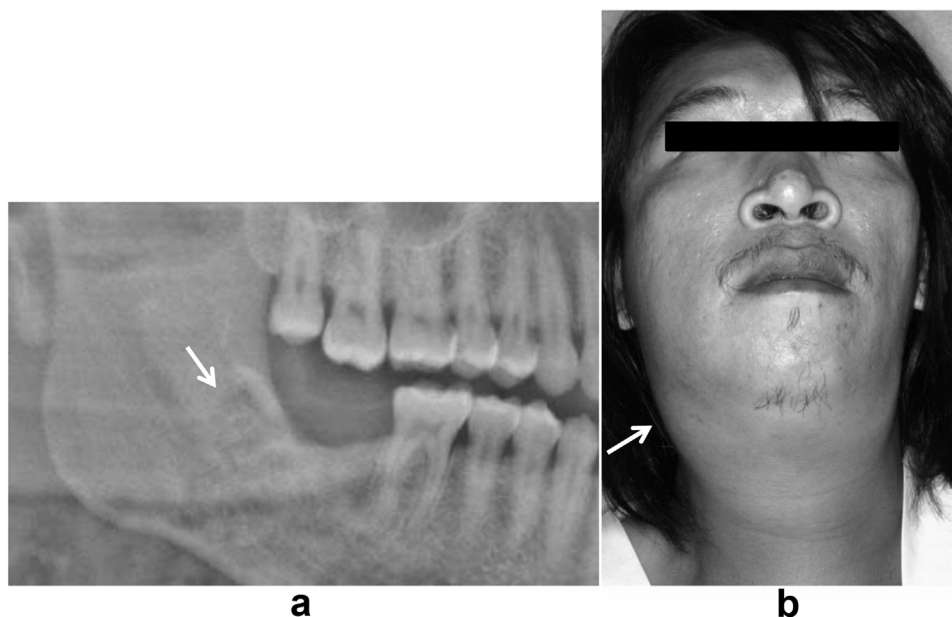


Fig. 1. (a) The pantomography after extraction of the patient's lower right wisdom tooth (arrowhead). (b) Clinical views of the cervical region of the patient before surgery. Swelling from the submandibular to cervical region was observed (arrowhead).

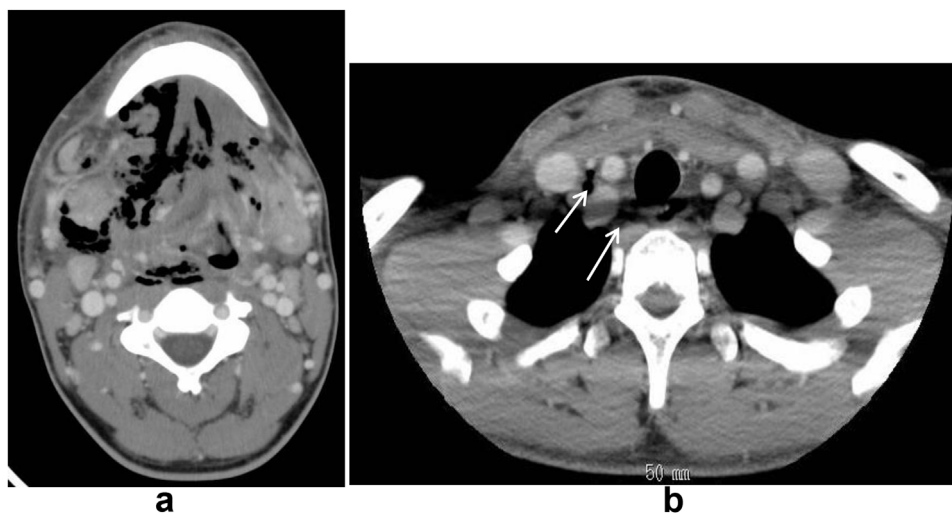


Fig. 2. Enhanced CT revealed (a) obvious abscess formation and gas accumulation in the right cervical region and (b) the presence of mediastinal emphysema (arrowheads).

found to be located (i) from the right submandibular and sublingual space to the para- and retropharyngeal space, (ii) from the pterygomandibular space to the temporal fossa, (iii) and from the carotid space to the mediastinum (Fig. 2b). Based on this examination, we made the diagnosis of CNF with mediastinitis. An administration of empiric large-spectrum antibiotics by the parenteral route (sulbactam sodium/ampicillin sodium [SBT/ABPC] 3.0 g every 6 h plus clindamycin [CLDM] 600 mg every 8 h) (Fig. 3) was started.

Extensive surgical debridement was performed after the antibiotics administration was established. In the nasal tracheal intubation procedure, airway obstruction by the sinking tongue root was observed, and an emergency tracheotomy was thus performed. During the surgical procedure, the platysma muscle of the cervical region was reversed and the forward edge of the sternocleidomastoid was exfoliated as much as possible. A huge amount of pus was observed in the deep cervical region. The pus was gray in color, viscous and foul-smelling. The culture test of the pus showed the presence of

group F beta-hemolytic *Streptococcus* (*S. milleri*), *Peptostreptococcus asaccharolyti*, *Fusobacterium nucleatum*, *Bacteroides* sp., *Neisseria* sp., and alpha-hemolytic *Streptococcus*. All of the detected bacteria were susceptible to the following antibiotics: benzylpenicillin, ampicillin, SBT/ABPC, amoxicillin/clavulanate, cefotaxime, imipenem/cilastatin, panipenem/betamipron, meropenem, erythromycin, clarithromycin, CLDM, minocycline, chloramphenicol, vancomycin, moxifloxacin, levofloxacin.

Extensive necrosis of submandibular suprahyoid muscles was observed under the superficial layer of cervical fascia between the submandibular gland and the lower edge of the mandible. Surgical debridement of the extensive necrotic area was performed. After penetration of the cervical area and the oral floor, irrigation by saline solution and drainage were conducted for all involved spaces. Five of drains were left in these spaces. The internal jugular vein and carotid sheath were exfoliated to approach the deep cervical region. Parapharyngeal tissue was carefully exfoliated, but an approach to the retropharyngeal space was not performed. After this 1st

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