



Oral Medicine/Review article

Difficulty in diagnosis of tetanus in Japan: Report of a case and review of the literature[☆]

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ABSTRACT

Although tetanus is a rare condition in Japan, it still has a high mortality rate. As patients show trismus, dysphagia, and rigidity of the neck, they tend to consult specialists in dentistry, otolaryngology, and orthopedics. Sometimes, accurate diagnosis of tetanus is not made at the first consultation. Here, we report a case of tetanus referred to our department that was appropriately managed with early diagnosis. Moreover, we reviewed the literature concerning 47 patients with tetanus from 2000 in Japan regarding which department they visited first, the initial diagnosis, and clinical courses of the patients.

The orders of the first visiting departments were otolaryngology, internal medicine, general surgery, orthopedics, emergency, and dentistry. Only 6 patients (6/47: 13%) were correctly diagnosed as having tetanus at the first diagnosis. In contrast, the remaining 41 cases did not receive a correct diagnosis at the first visit. Twenty patients (20/47: 43%) were diagnosed as “unknown etiology”. After additional consultations, the final diagnosis of tetanus was made mainly in dentistry, emergency, otolaryngology, and internal medicine. As for the treatment, the patients received actual treatment for tetanus mainly in the department of emergency, internal medicine, anesthesiology, and neurological medicine. Thirty-two of the patients (32/47: 68%) entered the ICU.

In conclusion, head and neck specialists should be equipped to make correct diagnosis in patients with tetanus. Close communication with specialists in the ICU is important, along with education of doctors, staff, and students regarding the importance of rapid diagnosis of tetanus.

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1. Introduction

Tetanus is now a rare disease in developed countries, with reported occurrence rates of 50–80 cases/year in Japan [1,2], 20–30 cases/year in the UK [3], and about 120 cases/year in the USA

[3,4]. Its rarity is a result of the immunization programs in these countries [3,5].

Tetanus is caused by an anaerobic gram-positive rod-shaped bacterium, *Clostridium tetani*, with diagnosis based on history of penetrating trauma [6]. Although tetanus is rare in Japan, estimates of the global incidence of tetanus are 500,000 to one million cases/year with a mortality rate of up to 45% [4,7,8]. The presentation of tetanus is so characteristic that a presumptive diagnosis can be made in most cases [8]. However, the number of doctors capable of making a quick and accurate diagnosis of tetanus is decreasing because of the reduction in number of patients [9]. Moreover, as this disease sometimes occurs due to occult trauma, 6–25% of cases

[☆] 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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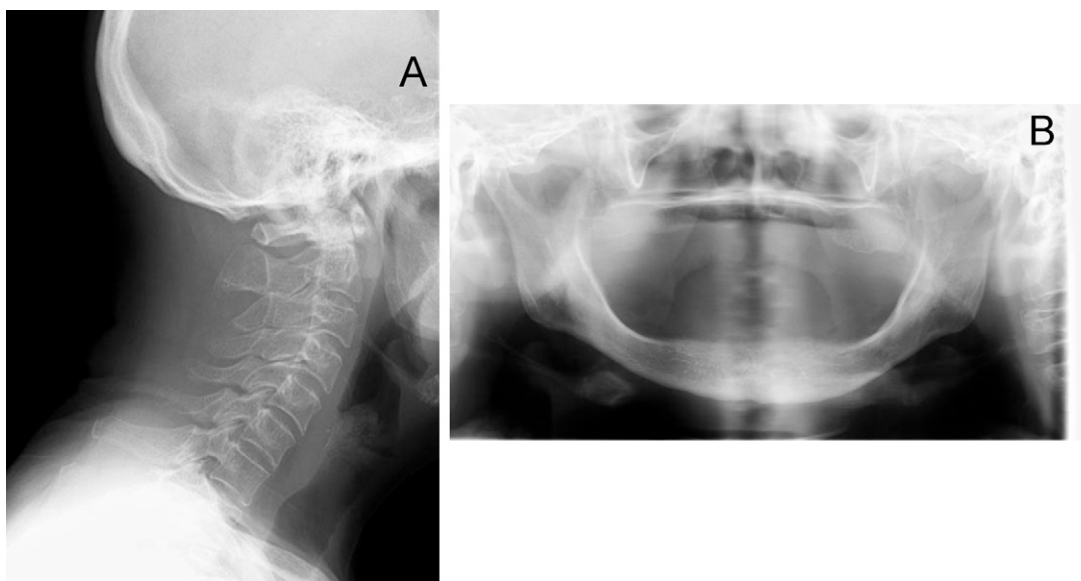


Fig. 1. X–P findings of the neck and mandible at the first visit. Cervical X–P revealed no abnormalities (A). Panoramic radiography also revealed no abnormalities in the TMJ region (B).

have no obvious etiology of injury [5,6,9–11]. These factors may make the diagnosis of tetanus more difficult.

As the initial symptoms of tetanus are usually trismus, masseter muscle spasm, nuchal rigidity, and dysphagia [9,12], many patients tend to consult with specialists in head and neck diseases, such as dentists, otolaryngologists, and orthopedic surgeons. In contrast, patients with severe symptoms, such as general spasm and respiratory difficulties, may consult with emergency medical specialists [3,13–17].

Here, we report a case of tetanus referred to our department from the otolaryngology and orthopedics departments of our hospital. In addition, we reviewed the literature concerning 47 patients with tetanus (including the present case) from 2000 in Japan regarding which department they visited first and the initial diagnosis. Moreover, we studied the clinical courses of the patients, and which department made the final diagnosis of tetanus, and performed actual treatment of tetanus. To our knowledge, there have been no previous studies of these questions.

2. Case report

A 76-year-old woman visited an otolaryngologist at our hospital due to rigidity of the neck and trismus, and a diagnosis of stiff shoulder was made in July 2010. Four days after visiting the otolaryngology department, she also consulted an orthopedic specialist at our hospital and a diagnosis of cervical disorder was made. However, X-ray imaging revealed no abnormalities (Fig. 1A). On the same day, the orthopedic specialist consulted with us about trismus. On examination, the patient was conscious, but had not been able to eat or drink sufficiently for 3 days because of dysphagia. Moreover, she could not speak well due to tangling of the tongue. Her medical and family histories were non-contributory except for controlled diabetes. Her body temperature was 36.5 °C, blood pressure was 120/70 mmHg, and pulse rate was 70 beats/min. Her respiratory condition was stable with SpO₂ of 98%. There was no definite facial asymmetry. The skin of her face was moderately dry. Her face had the appearance of risus sardonius (Fig. 2A). Maximal mouth opening was 10 mm (between the dentures) (Fig. 2B). Panoramic radiography revealed no abnormalities in the temporomandibular joint (TMJ) or mandibular region (Fig. 1B). On asking about previous injuries, she recalled receiving a scratch on the left

Table 2

The clinical diagnosis at first consultation.

Unknown etiology	20 cases (43%)
TMD	7 cases (15%)
Tetanus	6 cases (13%)
Facial nerve palsy	4 cases (9%)
Pharyngitis	2 cases (4%)
Others	8 cases (17%)
Total	47 cases

TMD: temporomandibular joint disorder.

thumb while gardening 3 weeks previously. However, the wound had already healed (Fig. 2C: arrow).

Her white blood cell count was 4800/mm³ and C-reactive protein (CRP) level was within the normal range (0.03 mg/dL). Blood chemistry was normal except for increased creatine kinase (CK) (262 U/L: normal range 45–163 U/L) and elevated blood sugar level (131 mg/dL). Under a clinical diagnosis of tetanus (stage II), we consulted with an emergency room physician and sent her immediately to the intensive care unit (ICU). In the ICU, she was managed with monitoring of vital signs and treatment for tetanus was begun immediately, including administration of human tetanus immunoglobulin (TIG; 4500 IU, div), tetanus toxoid (TT; 0.5 mL, im), and penicillin G (40 million IU/day, div) for 5 days. *Clostridium tetani* was not detected on blood culture. Her clinical course was uneventful, and progression to stage III did not occur. On hospital day 14, she was discharged because her symptoms had recovered completely. She could eat and drink well, and maximal mouth opening was 50 mm without difficulty (Fig. 3).

2.1. Review of the literature

Due to the decrease in number of patients with tetanus in Japan, young dentists and doctors do not encounter such cases frequently. This may lead to a delay in the diagnosis of tetanus in Japan [9]. In the present case, tetanus was not suspected on initial consultations. Therefore, we performed a review of the literature regarding the process of tetanus diagnosis in Japan.

A total of 47 patients with tetanus were reported in the Japanese literature from 2000. We investigated the cases from the medical databases including Medline on Ovid® (<http://ovidsp.tx.ovid.com/>) and the Japan Medical Abstract Society Web® (<http://login.jamas.or.jp/enter.html>). With regard to gender

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