Visual Journal of Emergency Medicine 16 (2019) 100603

Contents lists available at ScienceDirect

Visual Journal of Emergency Medicine

journal homepage: www.elsevier.com/locate/visj

Visual Case Discussion

Mid-aged woman with toothache and neck swelling

Pei-Ying Lin*, Cheng-Han Chen

Taipei Veterans General Hospital, No. 201, Sec. 2, Shipai Rd., Beitou District, Taipei City 11217, Taiwan

1. Case presentation

A 48-year-old female with IgA nephropathy status post cadaveric kidney transplantation 9 years ago under regular immunosuppressants presented to the emergency department (ED) as fever with a 4-day history of right mandibular area toothache with neck swelling. The patient had visited dentists 3 times within recent 1 year, where dental caries were recorded.

Physical examination revealed swelling over right submandibular area and tooth 47 mobility without lymphadnopathy. Blood test reported leukocystosis (11200/ul) with left shift (SEG:78.2%) and elevated CRP (6.5 mg/dL).

Soft tissue X-ray of neck (Fig. 1) identified submandibular soft tissue swelling with multiple gas foci within. Computed tomography scan of neck with contrast media (Fig. 2) reported peri-apical abscess of the right lower mola. A loculated abscess in the right submandibular region was also found. This lady was diagnosed of periapical infection with right submandibular abscess (Ludwig's angina). We consulted otolaryngologist and she was admitted and received IV antibiotic with Amoxycillin 1 g/Clav. 200 mg Q8H. Her fever subsided gradually, and discharged 7 days later under stable condition.

Fig. 1. Soft tissue X-ray of neck reviled submandibular soft tissue swelling with multiple gas foci within (arrow).

2. Discussion

The spread odontogenic infections can be diagnosed from the history with clinical and radiographic examination, and panoramic

Fig. 2. Computed tomography scan of neck with contrast media (axial view) reported peri-apical abscess of the right lower mola; A loculated abscess in the right submandibular region was also found (arrow).

* Corresponding author.
E-mail address: pylin13@vghtpe.gov.tw (P.-Y. Lin).

https://doi.org/10.1016/j.visj.2019.100603
Received 29 January 2019; Received in revised form 1 April 2019; Accepted 12 May 2019

radiograph of the jaws or CT scan of head and neck are considered to be the most ideal screening imaging technique,[1] but are not easily available in all clinical or ED settings. We provided that neck, soft tissue X-ray may also be effective for recognizing deep fascial space odontogenic infections, such as Ludwig's angina. Early recognition with otolaryngology consultation for airway management with systemic immediate initiation of broad-spectrum antibiotics for an immunocompromised patient is crucial.[2]

3. CPC-EM capsule

What do we already know about this clinical entity?

Complications of Ludwig angina include airway compromise, carotid sheath infection and arterial rupture, suppurative thrombo-phlebitis of the internal jugular vein, mediastinitis, empyema, pericardial and/orpleural effusion, osteomyelitis of the mandible, subphrenic abscess, and aspiration pneumonia.[1]

What is the major impact of the image(s)?

Soft tissue X-ray of neck may also be effective for recognizing deep fascial space odontogenic infections, such as Ludwig's angina.

How might this improve emergency medicine practice?

By recognizing the demonstration of Ludwig's angina on X-ray, clinicians could be aware of and treat submandibular space infections early owing to the critical complications.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.visj.2019.100603.

References

1. Ogle OE. Odontogenic infections. *Dent Clin North Am.* 2017;61:235–252.
2. Li RM, Kiemeney M. Infections of the neck. *Emerg Med Clin North Am.* 2019;37:95–107.

Questions

1. Which of following is the most critical complication of submandibular space infection?
   a. Vestibular abscesses
   b. Penetration of the alveolar bone
   c. Ludwig angina
   d. Focal lymphadenopathy

2. What is the most appropriate initial management for Ludwig angina?
   a. Arrange MRI scan as soon as possible
   b. Steroid and nebulized epinephrine use
   c. Immediate initiation of broad-spectrum antibiotics
   d. Observation in outpatient department

3. What is the most common microbiology of odontogenic infection?
   a. Polymicrobial
   b. Gram-negative rods alone
   c. Gram-positive cocci alone
   d. Anaerobic organism

Answers

1. Ludwig angina. Explanation: Ludwig angina is a serious and potentially life-threatening infection, which could rapidly progressed to airway compromise, carotid sheath infection and arterial rupture, suppurative thrombo-phlebitis of the internal jugular vein, mediastinitis, empyema, pericardial and/or pleural effusion, osteomyelitis of the mandible, subphrenic abscess, and aspiration pneumonia.[1]

2. Immediate initiation of broad-spectrum antibiotics. Explanation: Treatment includes admission to an intensive care unit for airway monitoring and the immediate initiation of broad-spectrum antibiotics with coverage for oral flora. Steroid and nebulized epinephrine use to delay surgical intervention has very limited evidence.[2]

3. Polymicrobial. Explanation: The pathogenesis of odontogenic infection is polymicrobial, consisting of various facultative anaerobes, such as the streptococci viridans group and the streptococcus anginosus group, and strict anaerobes, especially anaerobic cocci, Prevotella and Fusobacterium species.[1]