



Case Report

An Autopsy Case of Posterior Pharyngeal Abscesses Caused by Periodontal Bacteria

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Abstract: A woman in her seventies living alone was found dead on the floor of her living room. A blue-green swelling was found from her right cheek to her anterior neck and an autopsy was performed. The autopsy revealed subcutaneous abscesses from the right cheek to the anterior neck, posterior pharyngeal abscesses, mediastinal abscesses, pleuritis, and pericarditis. The cause of death was diagnosed as sepsis due to a retropharyngeal abscess caused by extensive severe periodontitis. The presence of a dentist at the autopsy allowed for a rapid diagnosis of periodontal disease, which was the cause of the posterior pharyngeal abscesses and septic shock. Therefore, the participation of a dentist in a forensic autopsy is important not only for personal identification but also for the rapid diagnosis of the cause of death.

Keywords: posterior pharyngeal abscess; periodontal bacteria; periodontitis



Citation: Bandou, R.; Ichioka, H.; Kawamoto, M.; Ikegaya, H. An Autopsy Case of Posterior Pharyngeal Abscesses Caused by Periodontal Bacteria. *Forensic Sci.* **2022**, *2*, 399–402. <https://doi.org/10.3390/forensicsci2020029>

Academic Editors:
Ricardo Dinis-Oliveira, Francisca Alves Cardoso and Pier Matteo Barone

Received: 21 March 2022

Accepted: 17 April 2022

Published: 19 April 2022

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1. Introduction

A posterior pharyngeal abscess is a pus accumulation in either the posterior pharyngeal space, the dangerous space, or the peri-pharyngeal space between the mucosa of the posterior pharyngeal wall and the cervical spine. Recently, the number of posterior pharyngeal abscesses in infants has decreased sharply due to the development of antibiotics, and on the contrary, the number of posterior pharyngeal abscesses in middle-aged and elderly people has tended to increase [1]. When inflammation spreads to the mediastinum and leads to mediastinitis and mediastinal abscess, the prognosis is poor, with a mortality rate of approximately 40% [2]. Intraoral findings contain a lot of useful information for personal identification. It is possible to identify a person by matching dental treatment marks with the medical records of the clinic [3,4] and to estimate the age and sex of the person from the bite and wear of the teeth [5]. In addition, an oral examination can sometimes help us to identify lifestyle and vocational activity that occurred before death, including eating and smoking habits [6–10].

In the case of decomposed, burned, or skeletal cadavers, the teeth are preserved for a long period, so intraoral findings can be collected [11,12] and play an important role in personal identification. However, intraoral findings are often neglected in the investigation of the cause of death. In our institute, at least one dentist participates in every autopsy. We report a case in which a dentist participated in the autopsy, which led to a quick diagnosis of the cause of death.

2. Case

One winter afternoon, a 76-year-old woman living alone was found face down and dead in her room. A large blue-green discoloration was found on the right cheek, and the right side of her face was swollen (Figure 1A). Therefore, a forensic autopsy was performed the next day. The day before she was found, she had canceled an appointment at an osteopath's clinic because of a sore throat.

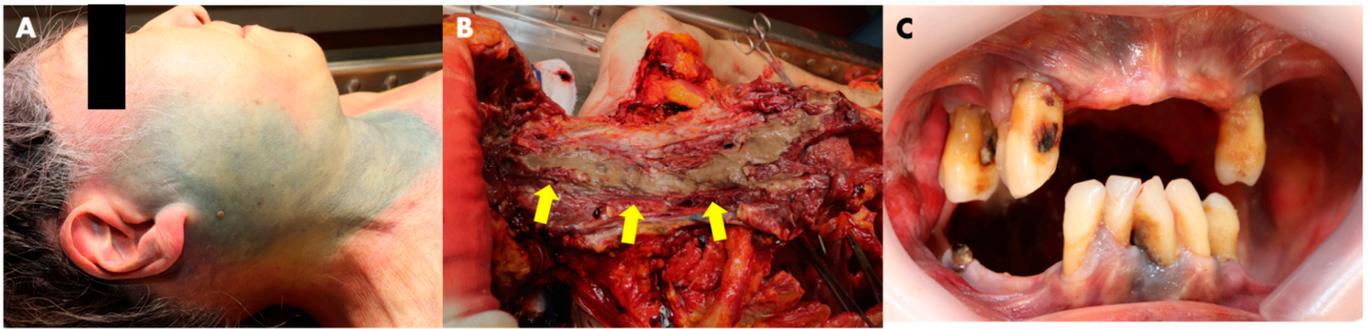


Figure 1. (A) Swelling and large blue-green discoloration spots of the right cheek and anterior neck. (B) White pus on the anterior surface of the cervical spine and upper thoracic spine. (C) All the teeth were unstable, gingival recession and gingival redness were observed, and the hygienic condition was quite poor.

During the autopsy, a large amount of white pus was found in the subcutaneous region of the right cheek and the anterior neck, the right sternocleidomastoid muscle, the upper end of the right sternohyoid muscle, and the region from the pharynx to the dorsal surface of the larynx and esophagus (posterior pharyngeal gap) (Figure 1B). In addition, pleural and pericardial effusions with pus were observed. No apparent airway obstruction was observed. No significant organ damage or lesions were observed. The intraoral examination showed that all the teeth were unstable, gingival recession and gingival redness were present, and the hygienic condition was quite poor (Figure 1C). The postmortem CT images of the head showed alveolar bone resorption in the entire jaw, especially around the right maxillary canine and the left mandibular central incisor (Figure 2). Post-mortem blood examinations showed white blood cell count: $109 \times 10^2/\mu\text{L}$, CRP: 40.15 mg/dL, and procalcitonin: 15.0 ng/mL. There is no standard value for post-mortem biochemical tests, so this is just a reference value. Histopathologic examination revealed microthrombi within the glomeruli of the right kidney (Figure 3A). Many neutrophils were found in the red splenic cord of the spleen (Figure 3B). In addition, microthrombi were found in various veins throughout the body. In the blood culture test, *Coagulase-negative staphylococci*, *Streptococcus mitis/oralis*, and *Pseudomonas alcaligenes* were detected. From these results, her cause of death was suspected to be septic shock caused by periodontal disease.

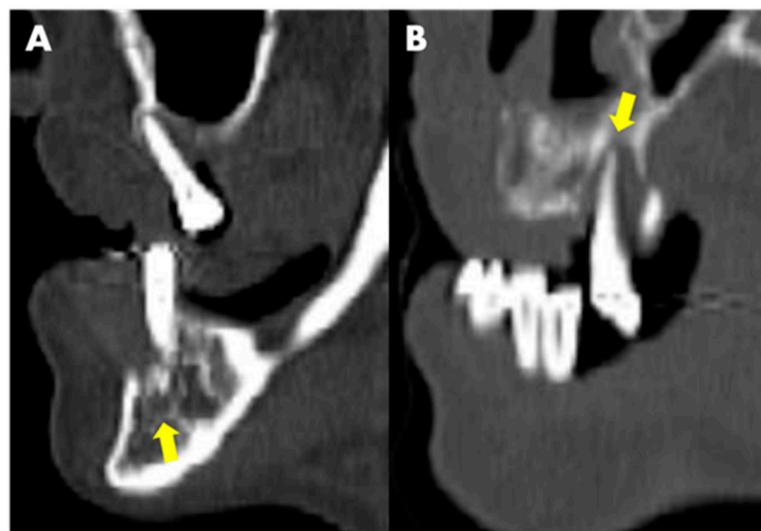


Figure 2. (A) Alveolar bone resorption around mandibular left central incisor. (B) Alveolar bone resorption around the maxillary right canine. (Postmortem CT of the head, sagittal section).

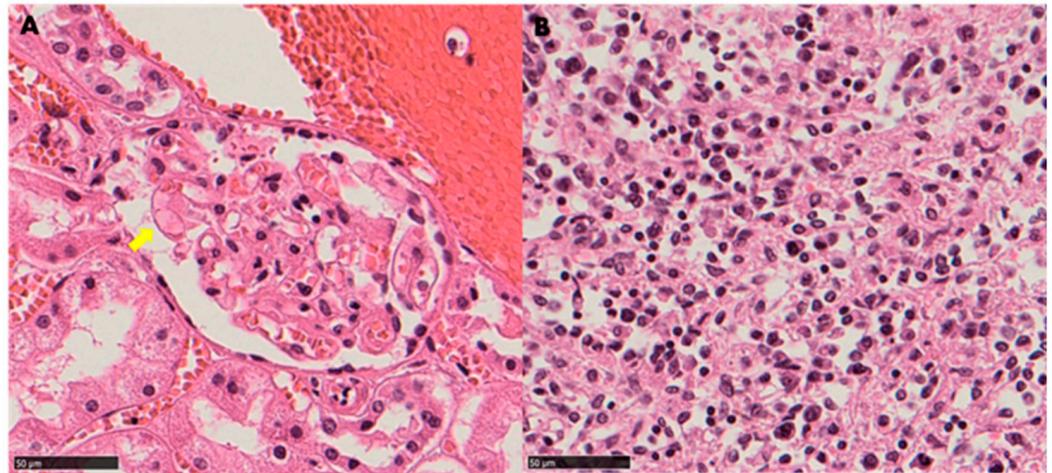


Figure 3. (A) Microthrombus was found in the glomerulus of the kidney (HE staining). (B) Many neutrophils were found in the red splenic cord.

Subcutaneous abscesses from the right cheek to the anterior neck, posterior pharyngeal abscesses, mediastinal abscesses, pleuritis, and pericarditis were observed, suggesting that she may have died of sepsis caused by these lesions.

Subsequent bacterial examination of pus from the subcutaneous region of the anterior neck and thoracic cavity revealed *Prevotella intermedia*, *Peptostreptococcus* sp., *Fusobacterium nucleatum*, and *Eggerthia cateniformis*, and the diagnosis was confirmed.

The bacterial species detected in these subcutaneous and mediastinal abscesses were also known as periodontal-associated bacteria and were considered to have been caused by the severe periodontal disease she had. However, the postmortem interval was about 48 h, and the bacteria present may have grown after death.

3. Discussion

There have been several reports of deaths due to posterior pharyngeal abscesses caused by periodontal bacteria [13–15]. In addition to posterior pharyngeal abscesses, spontaneous posterior pharyngeal hematoma and pharyngeal cancer have been reported as rare causes of death due to upper airway obstruction [16,17]. Periodontal bacteria have been reported to cause angina pectoris, myocardial infarction, cerebral infarction, and aspiration pneumonia [18–21]. In this case, no airway obstruction was observed from the posterior pharyngeal abscesses, and post-mortem blood culture test results showed oral bacteria. Normally, oral bacteria is not detected in the postmortem blood examination, suggesting that oral bacteria had invaded through the periodontal disease into the systemic blood and caused posterior pharyngeal abscesses, finally causing death by septic shock. It is very useful for dentists to diagnose the severity of diseases in the facial region that may be the cause of death. The participation of dentists in forensic autopsies makes it possible to quickly diagnose the cause of death, as seen in our case. However, despite the surplus of dentists in Japan, the number of forensic dentists is very small, and most of them work in single dental colleges. They have little cooperation with medical faculties that perform autopsies, and they are very rarely involved in autopsies. The dentist is usually called upon to assist with personal identification only after the autopsy.

4. Conclusions

Forensic pathologists must be aware of the need for evaluation by specialists, including dentists, and must ensure that they have the means to refer to specialists when necessary. On the other hand, we strongly insist that dentists actively participate not only in personal identification, but also in the investigation of cause of death.

5. Impact Statement

This case illustrates the importance of the dentist's participation in the autopsy, as the dentist was able to evaluate the oral disease, and the cause of death was thus determined.

Author Contributions: Forensic pathologist, H.I. (Hiroshi Ikegaya); forensic dentist, R.B.; investigation, R.B.; writing—original draft preparation, H.I. (Hiroaki Ichioka); writing—review and editing, H.I. (Hiroshi Ikegaya); visualization, M.K.; supervision and project administration, H.I. (Hiroshi Ikegaya). All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was not required because this case was a judicial autopsy.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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