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Case report

Special diffusion pathway of pericoronitis of the third molar: A case report and literature review

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ABSTRACT

Introduction: Pericoronitis of wisdom teeth along the jaw diffusion may be a rare diffusion pathway, which can cause osteomyelitis and maxillofacial space infection serious complications.

Presentation of case: A 62-years-old male patient presented with swelling and discomfort of the right cheek for more than 1 year. The patient was previously healthy and denied various systemic medical histories. The patient's face was asymmetric, the right cheek was swollen, and the depressed edema was seen on the surface of the masseter area of the right parotid gland. Based on the preoperative cone-beam computed tomography (CBCT) imaging results, the initial diagnosis was: centralized osteomyelitis of the jaws. The surgical plan was minimally invasive extraction 48 and localized debridement of the lesion area. After three months of follow-up, the patient's symptoms were significantly improved without recurrence.

Discussion: Pericoronitis of wisdom teeth along the jaw diffusion is a rare diffusion pathway, which can lead to secondary jaw osteomyelitis, the treatment of which consists of lesion debridement, dead bone curettage and antibiotic therapy.

Conclusion: Through literature review and summary of the diagnosis and treatment process of this case, such cases should be diagnosed as early as possible and conservative treatment should be actively used to avoid the occurrence of complications. In addition, the special diffusion pathway of this case may provide a new theoretical basis for the source of infection of central jaw osteomyelitis.

1. Introduction

Due to human evolution and increasingly refined food, jaw disuse degradation, third molars often erupt incompletely or impacted, the incidence was 16.7–68.6 % [1]. If the soft tissue around the crown is infected, it is easy to cause inflammation, which is called pericoronitis of wisdom teeth. This disease usually occurs in young people aged 20–25 years old, with an incidence of 4.92 % [2], of which pericoronitis of mandibular wisdom teeth is the most common. The most common types of pericoronitis in wisdom teeth are class II and median impaction [3]. If the inflammation is not controlled in time, it can spread to the surrounding tissues along the surface of the mandible or lymphatic vessels, causing complications such as maxillofacial space infection, buccal fistula and marginal osteomyelitis of the jaw [4]. The formation of a tunnel-like diffusion channel due to bone destruction along the jaw is a rare but serious complication of central mandibular osteomyelitis.

2. Case presentation

A 62-years-old male patient presented with swelling and discomfort of the right cheek for more than 1 year. The patient's face was asymmetric, the right cheek was swollen (Fig. 1A), and the depressed edema was seen on the surface of the masseter area of the right parotid gland (Fig. 1B). There was no eruption of 48 teeth in the mouth, 47 teeth had no caries, no percussion pain, no loosening, mild redness and swelling of the buccal and distal gingiva (Fig. 1C), and the depth of the periodontal pocket at the distal site was about 10 mm.

CBCT coronal position: 48 horizontal low-impact teeth, the root is adjacent to the mandibular canal, and low-density transmission images can be seen below 1/3 of the root (Fig. 1D, F). Horizontal position: 48

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crowns showed a large area of dark shadow around the crown, and the buccal bone wall had a penetrating defect (Fig. 1G). Three-dimensional reconstruction: penetrating bone defect in the right mandibular angle (Fig. 1E).

Preoperative blood routine examination showed no obvious abnormalities in the total number of white blood cells, neutrophils, and lymphocytes in the inflammatory state (Table S1). This indicates that the patient 's jaw inflammation is in a chronic phase and surgery can be performed. Our treatment plan includes 48 teeth extraction, scraping of dead bone, iodoform gauze drainage exudate, and antibiotic therapy. The operation process is shown in Fig. 2. After tooth extraction, the patient was given an intravenous infusion of cefuroxime and metronidazole for one week. (The medicines, materials, and equipment used during the surgery are listed in the Table S2).

Pathological examination showed neutrophil infiltration in the affected area, suggesting chronic inflammatory lesions of the jaw (Fig. 3A). Three months after operation, CBCT examination showed that the penetrating bone defect of the right mandibular angle was significantly smaller and healed well (Fig. 3B). The above case report was in line with the SCARE criteria [5].

3. Discussion

Pericoronitis of the wisdom tooth stands as a frequent complication encountered in impacted third molars. The inflammatory process can either remain confined to the vicinity of the tooth crown or extend along adjacent anatomical spaces, with typical dissemination patterns (Fig. 4A) [4]. In the clinical examination of this case, the periodontal pocket of about 10 mm deep in the distal part of 47 teeth was detected. Combined with the imaging results, it was speculated that the source of infection in this case may be the infection caused by oral bacteria entering the crown of tooth 48 along the narrow and deep periodontal pocket at the distal end of tooth 47. Inflammation dissolves the jaw bone to form a tunnel-like a special diffusion pathway, secondary to central mandibular osteomyelitis and masseter space infection (Fig. 4B).

Through literature review, it was discovered that central mandibular osteomyelitis secondary to wisdom tooth pericoronitis, specifically through drainage pathways, is rare. It occurs in the condyle, coronoid

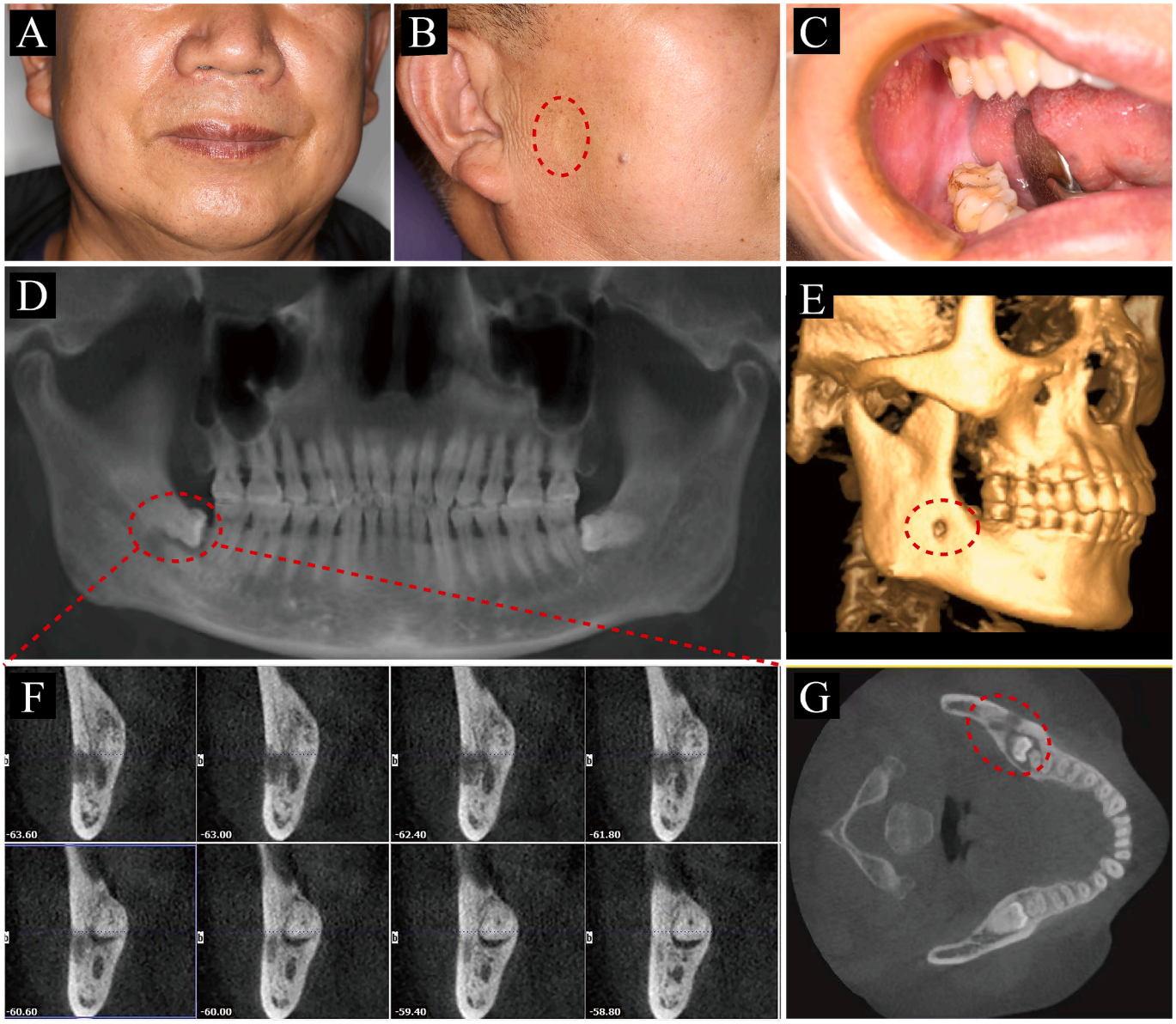

Fig. 1. (A-C) Frontal photos, 45° lateral photos and preoperative intraoral photos. (D-G) Imaging findings of the affected teeth and secondary central jaw osteomyelitis in CBCT.

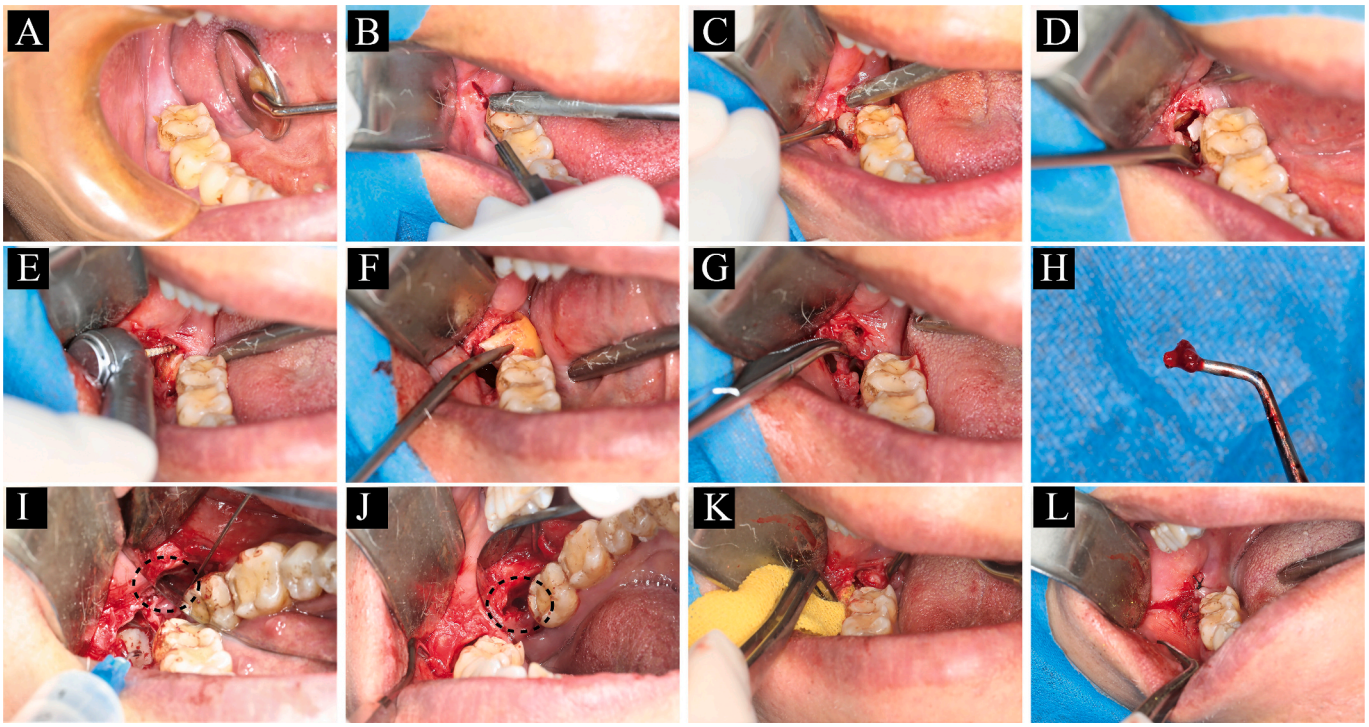

Fig. 2. (A) Surgical area photos. (B) Incision. (C) Raising of flap. (D) Crown separation by T incision. (E) Sectioning of tooth root. (F) Elevation of tooth roots. (G) Removal of inflammatory granulation tissue. (H) The dead bone was scraped and sent for pathological examination. (I) Rinsing with 0.9 % sodium chloride solution. (J) Drainage of infection. (K) Packing with iodoform yarn. (L) Suturing.

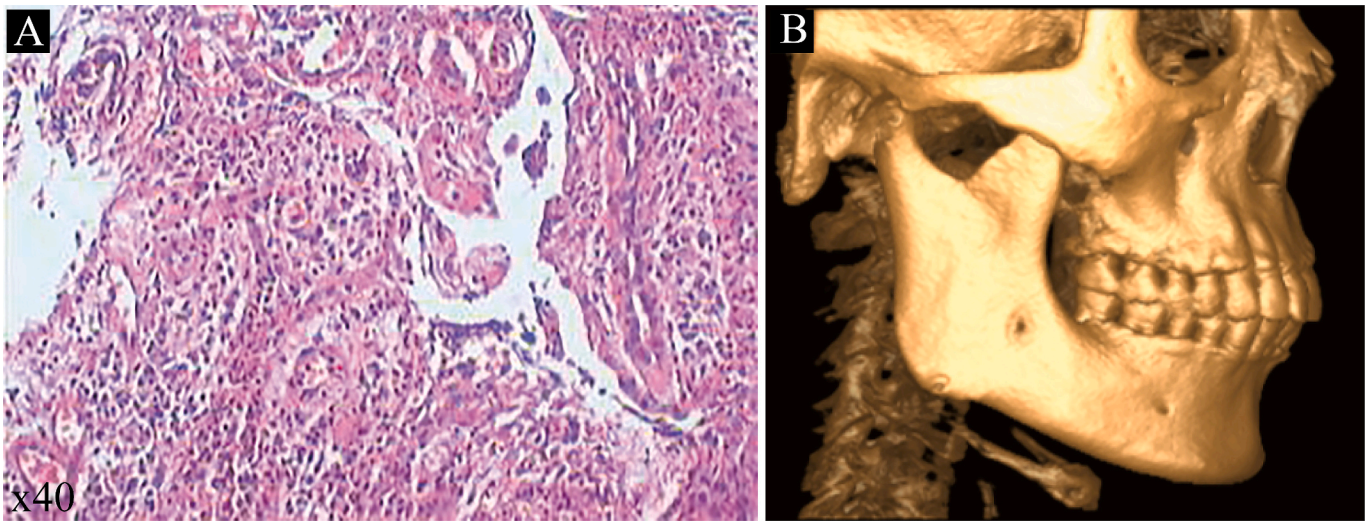

Fig. 3. (A) Pathological results. (B) CBCT three-dimensional reconstruction.

process, mandibular ramus, mandibular body, and mandibular angle (Table S3). This case may be the first reported instance of central mandibular osteomyelitis secondary to wisdom tooth pericoronitis.

Treatment of osteomyelitis of the jaws includes lesion debridement, dead bone curettage, and antibiotic therapy. Among them, lesion debridement is the primary treatment [6]. The cause of the disease is mostly caused by a mixed infection of aerobic and anaerobic bacteria [7], of which *Staphylococcus aureus* and *hemolytic streptococcus* are the most common pathogens [8]. Antibiotics are essential adjuvant therapy during treatment. The expert consensus proposed by Li et al. [9] emphasizes that when the type of pathogenic bacteria has not been determined, it is recommended to use the second-generation cephalosporins combined with nitroimidazole antibiotics, which have strong activity against gram-positive bacteria and gram-negative bacteria. The patient was given intravenous infusion of cefuroxime and metronidazole for one week after operation [9]. Three months after operation, CBCT examination showed that the penetrating bone defect at the anterior and superior part of the right mandibular angle was significantly smaller and healed well, indicating that the above treatment effect was good.

4. Conclusion

Through a literature review and summary of the diagnosis and treatment process of this case, such cases should be diagnosed as early as possible and conservative treatment should be actively used to avoid the occurrence of complications. In addition, the special diffusion pathway

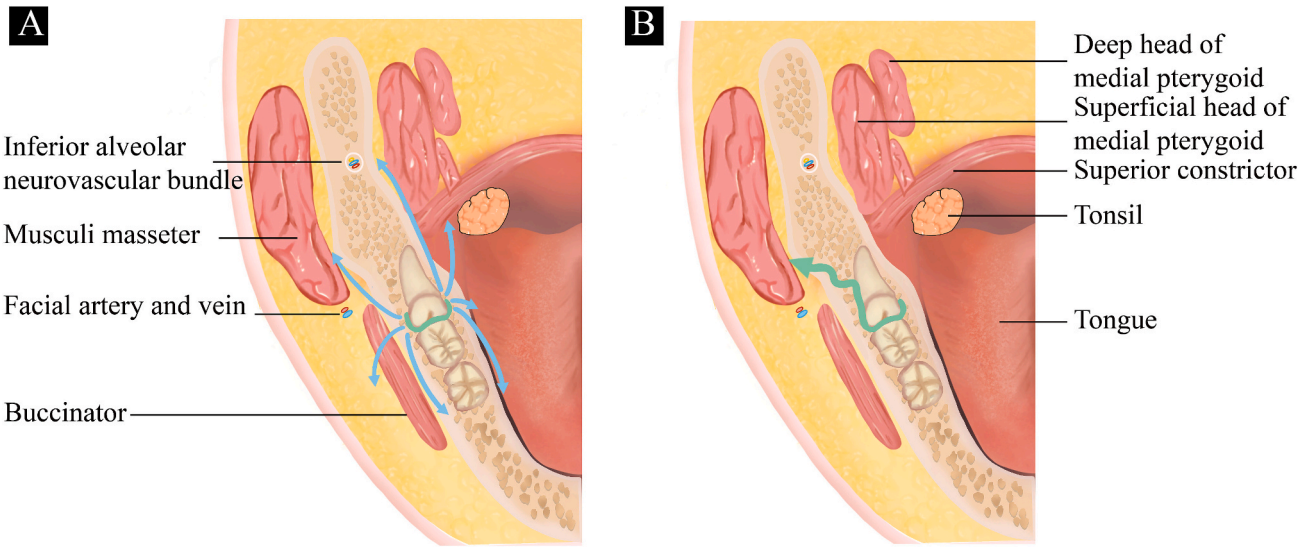

Fig. 4. (A) Common wisdom tooth pericoronitis diffusion pathway. (B) Schematic diagram of the presumed diffusion pathway in this case.

of this case may provide a new theoretical basis for the source of infection of central jaw osteomyelitis.

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Ethical approval

This study was approved by our hospital ethics committee.

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Author contribution

Baoquan Fan: Case data interpretation, Case data analysis, writing the paper and literature review, Zhige Li: Surgery performed, study concept & design, Tao Wu: Data organization, chart processing, Ziyuan Li: Case data collection and writing the paper.

Xiangxue Yu: Postoperative follow-up data collection, Baoping Zhang: Writing instruction, paper revision and review.

Guarantor

All authors.

Declaration of competing interest

All authors have no conflict of interest.

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