



# A Diabetic Patient with Acute Osteomyelitis Presenting with Jaw Pain and Submandibular Swelling

Mel Mupparapu, DMD, MDS, DiplABOMR<sup>a,\*</sup>,  
Angela M. Barnes, RDH, PHDHP, MEd<sup>b</sup>, Archana Mupparapu, BS<sup>c</sup>,  
Steven R. Singer, DDS<sup>d</sup>

## KEYWORDS

- Osteomyelitis • Mandible • Jaw pain • Abscess • Inflammation
- Type 1 Diabetes Mellitus

## KEY POINTS

- Management of type 1 diabetes mellitus.
- Identification of osteomyelitis.
- Management of osteomyelitis.
- Selection of antibiotic appropriate to the infection.
- Culture and sensitivity of the microbes.

## MEDICAL SCENARIO

A 26-year-old female patient presents to Oral Medicine with jaw pain and right submandibular swelling. She has type 1 diabetes mellitus (T1D) managed by long-acting basal insulin. Patient titers insulin at home every 2 or 3 days. No other medical comorbidities. Physical examination revealed a generalized swelling on the mandibular right side, teeth 28 to 30 sensitive to palpation.

## DENTAL MANAGEMENT DECISION AND JUSTIFICATION

Patient presented with a fluctuant swelling on the right side of the jaw with pus discharge on palpation (**Fig. 1**) from intraoral sinuses in the vicinity of teeth 27, 28, 29, and 30 (mandibular right quadrant). All the teeth in the region were tender to

<sup>a</sup> University of Pennsylvania School of Dental Medicine; <sup>b</sup> Community College of Philadelphia;  
<sup>c</sup> Temple University School of Medicine; <sup>d</sup> Rutgers University School of Dental Medicine

\* Corresponding author. Penn Dental Medicine, Dept of Oral Medicine, 240 S 40th Street, Philadelphia, PA 191104.

E-mail address: [mmd@upenn.edu](mailto:mmd@upenn.edu)



**Fig. 1.** Intraoral photograph of the patient showing pus discharge noted in the mouth from right mandibular infection.

palpation. Patient reported to Oral & Maxillofacial Surgery clinic where an incision and drainage was performed. A panoramic radiograph was obtained at this visit that demonstrated no significant bony changes. Patient was placed on clindamycin, 300 mg, every 6 hours for 5 days. Patient was referred to the Hospital of the University of Pennsylvania where a computed tomography (CT) of head and neck with contrast was obtained. The CT showed regions of low attenuation in the right submandibular and sublingual spaces abutting the lingual and buccal cortices of the right mandibular body. There were changes suggestive of acute inflammation and reported as abscess formation, with a differential diagnosis of infection secondary to a tooth decay. Pus collection in the region seen on the CT was documented. Right level 1B lymph node enlargement was also documented. A few days later, patient reported to the Emergency Room of Hospital of the University of Pennsylvania with significant pain and swelling of the right submandibular region. Both intraoral drainage and extraoral drainage were performed at the hospital, and clindamycin was continued for suspected submandibular/sublingual space infection. Patient was referred to the dental school for management of a suspected deep carious lesion and necrotic pulp of tooth 28. Clinical examination revealed unhealed sinuses actively draining pus at this visit. A cone-beam CT was ordered at this visit, which showed significant changes in the alveolar bone housing teeth 27, 28, and 29. There was generalized widening of the periodontal ligament space, mixed density areas of the alveolus, giving the bone a “moth-eaten” appearance. Both teeth 28 and 29 had deep carious lesions, but the lesion in tooth 29 seemed more widespread. Patient felt better after this appointment, as she completed the course of antibiotics and followed rigorous home care. The attending clinicians suspected tooth 30 to be the culprit and extracted that tooth. A head/neck CT with contrast taken a week later showed near complete resolution of the fluid collection along buccal and lingual cortices. The patient was dismissed with home care instructions. An MRI taken on the same day the CT was obtained showed evidence of right mandibular osteomyelitis, with decreased signal of the bone marrow in the region corresponding to 27, 28, and 29, suggesting decreased fluid content. Patient was reevaluated a week later and given a clean bill of health. A few days later, patient had a recurrence of the extraoral sinus tract and presented to the Hospital of the University of Pennsylvania for treatment (**Fig. 2**). A new panoramic radiograph taken at this visit revealed significant bone loss, loss of continuity of the mandibular inferior cortex, and what seemed to be a sequestrum and multiple



**Fig. 2.** Extraoral fistula noted midway through the treatment after a prior incision and drainage of the area.

ill-defined radiolucent foci apical to teeth 27, 28, and 29 (**Fig. 3**). At this time, the patient was admitted to the hospital for a culture and sensitivity of the discharge for appropriate antibiotic coverage, and deep curettage and clean-up of the necrotic bone in the region was also suggested.

Although the management of the patient seemed appropriate at given points of time, the patient continued to suffer without any resolution of the osteomyelitis. Further, tooth 29 could not be treated endodontically because there were acute flare-ups of the infection related to this tooth. Was tooth 30 a culprit at all? Why did Clindamycin not work? Would it be better if we had the culture and sensitivity done the first time, before prescribing antibiotics?

### ***Ideal Management***

Patients with T1D need to be managed carefully, especially if an odontogenic infection is present. They are more prone to periodontitis, as there is increased expression of inflammatory cytokines and RANKL, which promote bone resorption.<sup>1,2</sup> In addition, reduced anabolic activity in periodontal tissues impairs soft tissue and bone repair. It is vital to ensure the patient is managing blood glucose levels sufficiently with either long-acting insulin or insulin pumps. Insulin deficiency can lead to dangerous acute



**Fig. 3.** Panoramic radiograph showing signs of osteomyelitis of the right mandible and the sequestrum of the right inferior border of the mandible just before the hospitalization of the patient.

conditions such as diabetic ketoacidosis and hyperosmolar hyperglycemic syndrome, both of which require urgent medical intervention. It is important, therefore, to closely monitor the patient's diabetic management and involve the patient's physician. When an osteomyelitis is suspected or known, the patient should be immediately hospitalized. Culture and sensitivity of the microbiota causing the infection must be identified and an appropriate antibiotic must be given.<sup>3</sup> Intravenous antibiotic administration is preferred. Oral antibiotics are not the choice of medication in cases complicated by underlying conditions such as diabetes, especially if an osteomyelitis is already set in.<sup>3,4</sup>

### CLINICS CARE POINTS

- Dental patients with underlying Diabetes Mellitus need to be managed proactively as they are prone to periodontitis and odontogenic infections.
- When a jaw osteomyelitis is suspected in a dental patient, hospitalization is recommended for better monitoring, culture and sensitivity of the microbes involved and administration of parenteral antibiotics that would significantly improve overall health outcomes.

### DISCLOSURE

None.

### REFERENCES

1. Graves DT, Ding Z, Yang Y. The impact of diabetes on periodontal diseases. *Periodontol 2000*;82(1):214–24.
2. Genco RJ, Borgnakke WS. Diabetes as a potential risk for periodontitis: association studies. *Periodontol 2000*;83(1):40–5.
3. Moratin J, Freudlsperger C, Metzger K, et al. Development of osteomyelitis following dental abscesses-influence of therapy and comorbidities. *Clin Oral Investig* 2021;25(3):1395–401.
4. Andre CV, Khonsari RH, Ernenwein D, et al. Osteomyelitis of the jaws: A retrospective series of 40 patients. *J Stomatol Oral Maxillofac Surg* 2017;118(5):261–4.