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Endodontic Therapy, Crown Amputation, and Soft Tissue Advancement to Treat a Hopeless Tooth

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Endodontic Therapy, Crown Amputation, and Soft Tissue Advancement to Treat a Hopeless Tooth

By Timothy Daws, DDS, and Thomas Bolten, DDS, MD

Clinical decision-making can be challenging when managing patients with a history of IV bisphosphonates and other antiresorptive medications such as Prolia and Xgeva. Extensive research has led to the prevailing wisdom that extractions should be avoided whenever possible in patients with a history of these medications.

However, where does this leave us when a tooth is clearly non-restorable? What if the patient has a high caries rate? Often, it seems that we are forced to choose between the proverbial rock or hard place when counseling patients in these situations. In this article we describe how a team approach between the general dentist, endodontist, and oral surgeon was utilized to successfully problem-solve this scenario in our clinical practices.

Medication-related osteonecrosis of the jaw, herein referred to as MRONJ, is a pathologic process of poor bone healing and bone death due to current or previous medications. A diagnosis of MRONJ is appropriate if a patient meets three criteria:

1. Current or previous treatment with antiresorptive therapy.

2. Exposed bone or bone probed through a fistula present for at least eight weeks.

3. No history of radiation therapy to the jaw or metastatic disease.

There are multiple antiresorptive medications that can lead to MRONJ, including bisphosphonates and RANK Ligand inhibitors. Xgeva, also known as denosumab, is a potent antiresorptive medication prescribed to cancer patients with metastatic lesions to bones. It is administered as a monthly injection. Denosumab is also marketed as Prolia, which is administered once every six months to treat osteoporosis. Prolia has a higher risk of MRONJ than bisphosphonates, and Xgeva carries an even higher risk.

Case study

The patient is an 89-year-old female with a grossly carious tooth #30. She has several risk factors for MRONJ. She is currently receiving monthly Xgeva injections to treat breast cancer that has unfortunately metastasized to the bones. She is immunocompromised due to her cancer and subsequent chemo and radiation therapy. She has extensive caries and difficulty maintaining her dentition. In addition, tooth #30 is in the posterior mandible, which has a higher risk of MRONJ when compared to the maxilla. A CBCT was taken showing gross caries on #30 extending into the furcation. There was no periapical pathology noted.

It was determined that #30 was non-restorable and indicated for removal. However, the risk of post-operative morbidity was high. The management of MRONJ requires close monitoring with regular appointments. It may also require multiple debridement procedures. This would be difficult for the patient given her advanced age and other medical issues. Therefore, her general dentist, endodontist, and oral surgeon collaborated to find an alternative solution.

MRONJ is typically triggered by a tooth extraction followed by poor bone healing. We elected to forego any trauma to the bone by performing endodontic therapy on the tooth, amputating the crown and a portion of the root structure, and then advancing a local soft tissue flap to obtain closure. This treatment is somewhat similar to a coronectomy, where the oral surgeon intentionally leaves a portion of the tooth root to avoid damage to a vital structure, such as the inferior alveolar nerve. This treatment is contraindicated in patients with an active infectious process or any type of periapical pathology.

This tooth had an abnormal root canal morphology due to the presence of a radix root on the mesiobuccal side of the tooth. This third root is

referred to as a radix paramolaris when it is located on the buccal side and is believed to have an incidence of <0.5% in European populations.[1] Despite the presence of this complicated anatomy, there were no signs of vertical root fractures, resorption, or any other reason to believe that endodontic treatment would not be successful.

A two-visit root canal was performed for three reasons. Firstly, gross caries debridement was performed well before the surgical flap advancement in order to minimize bacterial load in the surgical area. Secondly, the patient was confirmed to be asymptomatic and to have no signs of infection prior to surgically burying the remaining tooth structure. Finally, this approach allowed for a predictable obturation appointment, and her surgical procedure occurred within an hour of the root canal system being sealed.

After the canals were obturated a coronal restoration was immediately placed in the pulp chamber. The dentin was etched, bonded, and then flowable composite was flown into the coronal aspect of the canal orifices. Flowable composite was used because it could be successfully placed into the constricted space of the radix root. Geristore was then bonded into the pulp chamber for the coronal seal over top of the flowable composite. Geristore was the material of choice because it can bond in a moist field and is self-adhesive to dentin and cementum.

The patient then presented to the oral surgery office. A crown amputation was performed, and the root structure was removed to 2 mm below the alveolar crest. Next, a local full-thickness flap was advanced, and a tension-free primary closure was achieved. The root structure and adjacent bone were isolated from the oral cavity underneath

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Figure 1 — Pre-op CBCT

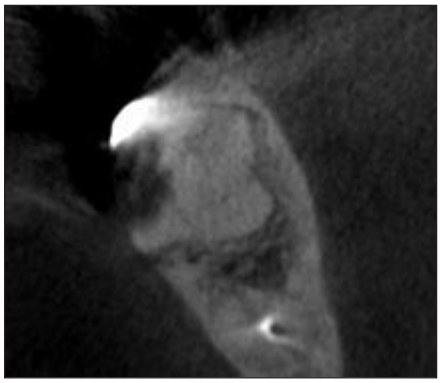


Figure 2 — Pre-op radiograph.

Figure 3 — Post-op radiograph.

the flap and were not visible clinically. The patient was placed on pre- and post-operative antibiotics and chlorhexidine mouth rinse.

Summary

Several follow-up visits were performed after treatment. The site has healed appropriately and she has no concerns or symptoms. A recent two-year follow-up with CBCT imaging showed no signs of infection or pathology around the tooth.

Figure 4 — 2-year CBCT

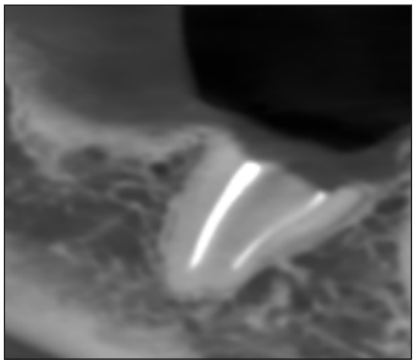
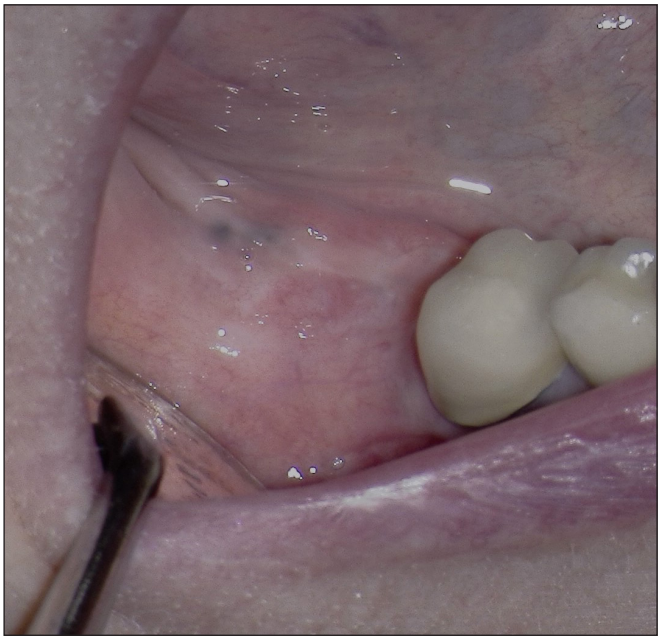


Figure 5 — Post-op two-year follow-up.



Conclusion

MRONJ is a disease process that can be very difficult to treat and may result in serious morbidity for patients. The risk is especially high in cancer patients receiving Xgeva for bone metastases, with studies reporting an incidence up to 5%. These risks are exacerbated by poor oral hygiene, immunocompromise, and involvement of mandibular teeth. The technique of endodontic therapy, crown amputation, and soft tissue advancement has been successful in our practices to treat hopeless teeth without the need to extract, thus limiting the risk of MRONJ.

Reference

1. Carlsen O, Alexandersen V. Radix paramolaris in permanent mandibular molars: identification and morphology. Scand J Dent Res. 1991 Jun;99(3):189-95. doi: 10.1111/j.1600-0722.1991.tb01884.x. PMID: 1871529.

About the Authors

Timothy Daws, DDS, graduated from the University of Michigan in 2009 with a B.S. degree in microbiology, and subsequently attended dental school at Columbia University in New York City. After graduating in 2013, he obtained a position as a general dentistry resident at the Northport VA Medical Center on Long Island. He earned his specialty certification in endodontics from Stoney Brook University in 2016. He practices in Shelby Township.

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Thomas Bolten, DDS, MD, attended the University of Michigan for his undergraduate and dental degrees, as well as Wayne State University for his medical degree. He is a member of the American Association of Oral and Maxillofacial Surgeons and multiple other local and national organizations. He is on staff at William Beaumont Hospital, where he treats victims of facial trauma and also volunteers at the Cleft Lip and Palate Clinic. He practices with Michigan OMS at locations in Clinton Township, West Bloomfield, and Richmond.

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