

TREATMENT OF A PATIENT WITH A PARTIALLY FAILED DENTITION AFTER INTRAVENOUS BISPHOSPHONATE THERAPY

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Bisphosphonate-induced osteonecrosis (BON) of the jaws has received a lot of attention by the dental world for nearly the last decade, due to the widespread use of bisphosphonate drugs. It is a condition characterized by exposure of bone in the mandible or maxilla persisting for more than 8 weeks in a patient who has been/is taking a bisphosphonate, and who has no history of radiation therapy to the jaws. Clinically, the disease is usually seen to present as spontaneous exposure of necrosed alveolar bone that occurs following an invasive surgical procedure such as extraction, periapical surgery, periodontal surgery, or implant placement; however, it may also occur in patients with poor oral hygiene or an ill-fitting denture. Dr. Robert Marx, Oral and Maxillofacial Surgeon, University of Miami, originally discovered the association, and is currently respected as the chief expert on the issue.

Bisphosphonate drugs come in both intravenous and oral preparations. The IV drugs have been paramount in the management of bone related malignancies such as multiple myeloma and hypercalcemia related to breast and prostate cancers. The less potent oral forms are primarily used to treat osteoporosis and osteopenia. The IV preparations include Aredia, Zometa, and Bonefos; oral drugs include Fosamax, Actonel, Boniva, Didronel, Skelid, and Reclast. The American Dental Association reports that 94% of documented BON cases have occurred in patients having taken intravenous preparations, while 6% of cases occurred with the oral preparations. Additionally, Marx reports that the successful management and long term sequelae associated with the IV preparations is much worse, and can occur with as few as 5 to 6 doses of a given drug. The best possible scenario is to avoid treatment interventions which may predispose these patients to the occurrence of BON.

The dilemma in dentistry is how to manage these patients when surgical treatment would conventionally be indicated for a given dental condition. In general, if an otherwise healthy patient has been treated with oral bisphosphonates for a duration of 3 years or greater, Marx suggests suspending the bisphosphonate treatment (drug holiday) for 4-6 months, and then assessing the general risk of BON with a serum CTX test, before providing the invasive treatment. If the patient has received IV treatment however, the risk of developing BON is high, and therefore all surgical intervention should be avoided for the rest of the patient's life (at least for now). If a tooth is unrestorable due to caries, then non-surgical root canal treatment and crown amputation is preferred over extraction. Restoration with removable prostheses is acceptable in compliant patients, according to Marx.

Figure 1 demonstrates an example patient who had been receiving high doses of an IV bisphosphonates for a malignancy, received a routine extraction for a second molar, and subsequently developed an osteonecrotic lesion associated with the first molar, 1.5 years later. This lesion is chronically infected and draining, has caused morbidity to the point of continuous pain management with narcotic patches, and has only worsened in the last 4 years.



fig 1

The following case study illustrates comprehensive treatment of a patient with a near hopeless dentition due to caries, and a 2-year history of treatment with IV bisphosphonates for multiple myeloma.

The patient is a 70 year old female who has previous bridge restorations and endodontic treatment which has all failed. Endodontic lesions are also present. View of the maxillary arch demonstrates a very large torus. The ideal conventional treatment in a normal and healthy patient would be full mouth extraction, and prosthetic replacement with conventional or implant retained dentures. If a conventional maxillary denture were to be considered, torus removal would be indicated. In light of this patient's history of IV bisphosphonate therapy, extractions, implant therapy, and torus removal are absolutely contraindicated.

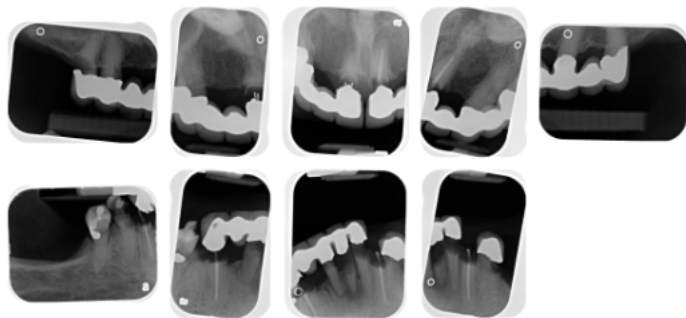
The following photographs and radiographs illustrate the patient's presenting condition:





and regular use of xylitol products. A recall interval of 3 months is currently being followed.

The following photographs and radiographs demonstrate the final treatment:



Because conventional treatment was contraindicated, an alternative plan was executed which avoided any surgical intervention. The first step of treatment was disassembly of the failed restorations and removal of all caries. After caries removal, only teeth #5, 11, and 13 were able to be salvaged for potential bridge abutments; all lower teeth were unrestorable for future fixed prosthodontics. The patient received non-surgical root canal treatment for all mandibular teeth which had not previously been endodontically treated, in addition to one upper premolar, by an Endodontist. After RCT was completed, amalcure buildups were placed in all lower teeth slightly coronal to the gingiva.



The maxilla was restored with a long span bridge fabricated with heat cured acrylic resin and reinforced with a glass fiber rope. Teeth #5, 11, and 13 were used as abutments, and the bridge was luted with a zinc-polycarboxylate cement. Because the patient had experienced such a catastrophic failure due to caries in the past, and still has severe xerostomia from medications, this particular treatment was elected to see if caries control is feasible long term. The bridge span in this situation is longer than ideal, but is the most reasonable option given the circumstances. A porcelain-metal bridge may be considered in the future depending on the patient's ability to control caries. A conventional denture was fabricated for the lower arch, with a cast metal base, to provide the most intimate fit to the teeth and tissues.



The patient has currently been restored for 6 months with successful esthetics and function, and without any additional breakdown from caries. An aggressive home care protocol has been prescribed for caries control including daily fluoride tray use, intermittent use of Chlorhexidine rinse (per ADA protocol for high caries),

