Bisphosphonates are therapeutic agents utilized in the treatment of osteoclast-mediated bone loss due to osteoporosis, hypercalcemia of malignancy, Paget’s disease of the bone, multiple myeloma, and metastatic malignancies such as breast, kidney, prostate and lung cancer (1,2,3). By far, the most common clinical condition treated with bisphosphonate therapy is osteoporosis. According to the National Osteoporosis Foundation, osteoporosis is a major public health threat for an estimated 44 million Americans, or 55 percent of the people 50 years of age or older.

Currently in the US, 10 million individuals are estimated to already have osteoporosis and approximately 34 million are estimated to have low bone mass, placing them at increased risk for osteoporosis and fractures. As the American population ages, so will the number of individuals at risk for osteoporosis and the number of individuals undergoing bisphosphonate therapy.

The first published report of bisphosphonate induced osteonecrosis of the jaw (BIONJ) was by Marx in September of 2003 (4). As of May 2007, more than 300 publications have linked bisphosphonates to osteonecrosis in the jaws and an estimated 10,000 individual cases have been reported (3). Bisphosphonates may be administered via oral or intravenous means. Oral bisphosphonates may be administered once per day, once per week or once per month. IV bisphosphonates may be administered monthly or even yearly in the case of the very potent Zometa.

Most authors believe the incidence of oral bisphosphonate-induced osteonecrosis to be approximately 0.015% after three years of oral therapy. The incidence of intravenous bisphosphonate-induced osteonecrosis is much higher than the oral form and has been reported to be as high as 30%. However, most studies report a more reliable incidence of intravenous bisphosphonate-induced osteonecrosis of approximately 8% (3).

BIONJ typically presents as areas of exposed bone in either the mandible or the maxilla (2:1 ratio of mandible to maxilla) that fails to heal despite local measures in a reasonable amount of time (8 weeks or greater) (1, 3, 5, 6). Patients may be asymptomatic or may complain of pain, drainage, foul taste, loose teeth or numbness (Figures 1, 3, 4). Radiographic evidence of BIONJ includes thickening or widening of the periodontal ligament space, areas of sclerotic bone and bone sequestrum formation and necrosis in the later stages (Figures 2, 5)(3,5).
Bisphosphonates vary in their relative potencies, however, intravenous bisphosphonates are more potent than oral forms. Oral bisphosphonates tend to accumulate in the bone much slower than intravenous forms. As such, patients are at an increased risk of developing BIONJ after six months of intravenous bisphosphonates usage versus three years of oral bisphosphonate use (1, 3, 6, 7). Osteonecrosis associated with intravenous bisphosphonates is generally more invasive, associated with a poorer prognosis and less responsive to surgical debridement than BIONJ associated with oral bisphosphonate therapy (3).

Dental treatment of patients undergoing bisphosphonate therapy depends on the potency of the bisphosphonate and the length of treatment (1). In general, patients taking oral bisphosphonates for less than three years have little risk of developing BRONJ and can be treated as any other patient (3, 7). For patients with a history of three years or more of oral bisphosphonate therapy, patients should be informed that there is a small, but definite risk of developing BIONJ (1,5). As such, elective invasive procedures such as extractions, preprosthetic surgery and periodontal surgery may be performed after informed consent documenting the risk of BIONJ (5).

For patients with a history of 6 or more months of intravenous bisphosphonate usage, all invasive oral surgery procedures should be deferred unless no other treatment option exists. Teeth that are nonrestorable are best treated with root canal therapy and crown amputation, teeth with failing root canal therapy are best treated with retreats and mobile teeth are best treated with splinting. Noninvasive dental procedures such as crown and bridge, removable partial dentures, complete dentures, root canal therapy, supragingival scaling and dental prophylaxis should be performed at any time on patients undergoing bisphosphonate therapy in order to maintain dental health and eliminate the need for future invasive procedures (1, 3, 7).

Prior to the initiation of intravenous bisphosphonate therapy certain dental procedures should be done in order to minimize the occurrence of BIONJ. All teeth that are hopeless, nonrestorable, abscessed, failing root canal therapy and grossly periodontally involved should be extracted. Periodontal procedures should be performed in an attempt to arrest periodontal disease and create a healthier oral environment. Patients with
full or partial dentures should be examined for areas of mucosal trauma, especially along the lingual flange area. Extensive patient education on oral hygiene and early recognition and appropriate referral/treatment will help to minimize the late complications of bisphosphonate induced osteonecrosis of the jaw (BIONJ)(1, 5).

Other Considerations:
Patients with certain repaired and congenital coronary heart disease (CHD), prosthetic heart valves, cardiac transplantation recipients whom have developed cardiac valvulopathy, previous infective endocarditis, artificial joints within the past 6 months and/or cardiac stents are subject to antibiotic prophylaxis 1 hour prior to your appointment.

References:


Bisphosphonate-related osteonecrosis of the jaw (BRONJ). AAOMS Surgical Update 20(2): 1, 2007
