



The International Academy of Oral Medicine and Toxicology

IAOMT Position Paper on Human Jawbone Osteonecrosis

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The International Academy of Oral Medicine and Toxicology (IAOMT) is founded upon the belief that “Science” should be the basis upon which all diagnostic and treatment modalities be based. In following that philosophy, this position paper is written utilizing the available information found in textbooks, research papers, and peer reviewed journal articles published throughout the world.

A review of the literature relating to the topic of Human Jawbone Osteonecrosis (JON) reveals that information has been researched and presented since the 1860’s with Barrett¹ and Noel² describing noticeable defects in the jawbone. Noel broke down even further the label of pathological jawbone as either “dead” or the less damaged “reduced vitality”. G. V. Black in his 1915 textbook set aside an entire section to describe the visual appearance and treatment of JON³. It is unfortunate that this information was seemingly forgotten until the 1970’s when others began researching the topic again and including information regarding JON in sections of modern oral pathology textbooks.^{4 5} Since that time, articles relative to JON have appeared in peer reviewed journals including the Journal of Endodontics, the Journal of Periodontics, Oral Surgery-Oral Medicine- Oral Pathology, the AGD’s General Dentistry, and the Journal of Craniomandibular Practice, and others. Unfortunately, the topic of JON remains controversial in some dental circles.⁶ It is acknowledged that clinically observable and histologically confirmed cases of Osteonecrosis pathologically exist in almost all other bones in the human body, yet some

¹ Barrett WC: Oral Pathology and Practice. Philadelphia, PA, S.S. White Dental Mfg. Co, 1898.

² Noel HR: A lecture on caries and necrosis of bone. Am J Dent Sci (series 3):189, 1868.

³ Black GV: A work on special dental pathology. Chicago: Medico-Dental Co, 1915; 388-391.

⁴ Ratner EJ, Person P, Kleinman DJ, et al: Jawbone cavities and trigeminal neuralgia and atypical facial neuralgias. Oral Surg Oral Med Oral Pathol 1979; 48: 3-20.

⁵ Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Pathology. Philadelphia: WB Saunders Co; 1995: 114.

⁶ Donlon, WC: Invited Commentary on Neuralgia-inducing Cavitational Osteonecrosis. Oral Surg Oral Med Oral Pathol March 1992; 73, no.3: 319-320.

clinicians still doubt that the same disease occurs in the alveolar processes of the human maxilla and /or mandible.⁷ It is our hope that a recent Pennsylvania action taken against a dentist providing treatment for JON which was later overturned by a hearing examiner for the Pennsylvania State Board of Dentistry will be helpful to advancing the issue. It was the finding of the examiner that 1) JON is accepted as a pathological entity by the majority of dental pathologists, 2) Treatment of this entity is within the standards of care of the State of Pennsylvania, 3) The use of a “thru transmission Ultrasonography” device known as a Cavitat™ is helpful in the diagnosis of this osseous pathology.⁸ The IAOMT hopes national and state dental regulating entities that have jurisdiction, licensing, and enforcement powers will become familiar with the current body of research regarding JON and base their opinions upon these facts (“Science”), rather than personal opinion or some other agency dictated agenda.

In order to fulfill the mission of educating practitioners and patients about JON, it is essential to acknowledge the existence of the disease entity known as Human Jawbone Osteonecrosis (JON). Also known as Cavitations, Cavitational Osteonecrosis, Ischemic Osteonecrosis, NICO’s, and various other labels, the presence of necrotic, dead, or dying bone in the jawbones is well established as a known pathology of mankind⁹. With application of the scientific method, it is clear that pathologically observed areas of JON are found in human jawbones. These bony defects when observed clinically present themselves in numerous ways. Some report that over 75% of lesions are completely hollow or filled with soft, grayish-brown and mushy tissue, often with yellowish oily material (oil cysts) found in the defective areas with surrounding normal bone anatomy¹⁰. Others report the presence of “cavities” having varying overlying cortical bone density that upon opening appear to have linings with fibrous black, brown or grey filamentous materials¹¹. Still others report gross changes variously described as “gritty”, “like sawdust”, “hollow cavities”, and “dry” with occasional sclerotic, tooth-like hardness of the cavity walls. These lesions upon histological examination appear similar to the

⁷ Freedman PD, Reich, FR, Steinlauf AF: Letters to the editor. Oral Surg Oral Med Oral Pathol, July 1998; 86 no 1: 3-4.

⁸ Hearing Examiner’s Proposed Adjudication And Order, Commonwealth of Pennsylvania, Bureau of Professional and Occupational Affairs v. Stephen R. Evans, D.D.S., May 10, 2007.

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⁹ Bouquot JE, Roberts AM, Person P: Neuralgia-inducing Cavitational Osteonecrosis (NICO): Osteomyelitis in 224 jawbone samples from patients with facial neuralgias. Oral Surg Oral Med Oral Pathol 1992; 73: 307-319.

¹⁰ Shankland WE, et al: Medullary and Odontogenic Disease in the Painful Jaw: Clinicopathologic Review of 500 Consecutive Lesions. Cranio 2002; 20, no. 4: 295-303.

¹¹ Ratner EJ, Person P, Kleinman DJ, Shklar G, Socransky SS: Jawbone cavities and trigeminal and atypical facial neuralgias. Oral Surg 1979, 48, no. 1: 3-20.

necrosis in other bones of the body and are histologically different from Osteomyelitis¹². It is therefore the position of the IAOMT that Human Jawbone Osteonecrosis (JON) is a diseased state that exists in human jawbones.

Diagnosis is difficult due to the fact that some JON is almost invisible on standard radiographic films commonly used in dentistry. Ratner and others have stated that since 40% or more of the bone needs to be altered to show changes on standard dental radiographs, the disease state is sometimes referred to as “undetectable” on dental films¹³. The interpretation of dental films is subjective and it is not uncommon for many trained researchers and clinicians to review identical films and come away with different interpretations¹⁴. For these reasons, Tech 99 scans, MRI with filters, CAT scans, and “through transmission Ultrasonography” (Cavitat™)¹⁵, digital radiography, and other methods to visualize these lesions are necessary. Techniques as described by Ratner utilizing digital palpation and pressures, diagnostic local anesthetic injections, history and location of radiating pain if present and other manual testing procedures are needed. Complicating the issue is the fact that some JON lesions cause pain (hence the coined term NICO that describes a neuralgia component) and other JON lesions do not cause unprovoked pain, swelling, redness, or even fever¹⁶. The histological markers are the same but the symptoms different. We believe that systemic illness previously not attributed to JON needs to be further evaluated¹⁷.

Once the location and size of the lesions are determined, treatment modalities are needed. The IAOMT believes that it is generally unacceptable to leave “dead bone” in the human body. It is believed that JON lesions can be the foci for systemic toxins to begin the process of degrading patients’ overall health. Hydrogen sulfide has long been regarded as the most toxic material the human body can produce. The Affinity Labeling Technologies Lab Corporation has found substances that are far more toxic to five

¹² Bouquot JE, Roberts AM, Person P: Neuralgia-inducing cavitational Osteonecrosis (NICO): Osteomyelitis in 224 jawbone samples from patients with facial neuralgias. *Oral Surg Oral Med Oral Pathol* 1992; 73: 312-315.

¹³ Ratner EJ, Person P, Kleinman DJ, et al: Jawbone cavities and trigeminal and atypical facial neuralgias. *Oral Surg Oral Med Oral Pathol* 1979; 48, no. 1: 3-20.

¹⁴ Cohen S: Diagnostic procedures. In: *Pathways of the pulp*. 6th ed. Cohen S, Burns RC (eds). St. Louis: CV Mosby Co; 1994:10.

¹⁵ Imbeau J: Introduction to Through-Transmission Alveolar Ultrasonography (TAU) in Dental Medicine. *Cranio* April 2005, Vol. 23, No.2: 100-112.

¹⁶ Bouquot JE, LaMarche MG: Ischemic Osteonecrosis under fixed partial denture pontics: Radiographic and microscopic features in 38 patients with chronic pain. *J Prosthetic Dent* 81:148-158.

¹⁷ Bouquot, JE: Characterization and identification of chemical toxicants isolated from cavitational material and infected root canal teeth; in situ testing of teeth for toxicity and infection. *Proceedings of Annual Meeting, International Academy of Oral Medicine and Toxicology*; San Diego, California; 1997.

essential mammalian enzymes than hydrogen sulfide in JON biopsy samples¹⁸. Biopsy to confirm the diagnosis of JON and rule out other disease states including cancer is mandatory. Then, adequate treatment to remove or eliminate the involved pathology and stimulate the regrowth of normal, vital bone is necessary. At this time in the peer reviewed literature, surgical therapy excising the affected non-vital bone appears to be the favored treatment for JON. However, alternative techniques that are used in Europe and other parts of the world as primary or supportive therapies should also be evaluated. These include homeopathy, electrical stimulation, ionizing radiation such as laser and infrared, medical grade oxygen/ozone, hyperbaric oxygen, anticoagulation modalities, Sanum remedies, nutrition and nutraceuticals, energy treatments, and others. The IAOMT believes these forms of treatment should be evaluated and confirmed to be viable forms of treatment or shown ineffective and eliminated from use¹⁹. Standards of care to ensure proper healing and detoxification should be established. Techniques for evaluating success should be tested and standardized. Protocols or procedures to help determine when treatment is appropriate and when it is not should be put forth for evaluation.

Researchers have shown that JON is a disease of reduced blood flow²⁰. Genetic predisposition, effects of certain medications, trauma and infections, and other factors like smoking and atmospheric extremes lead to the formation of JON²¹. In no other bone is the potential for trauma and infection as great as in the jawbones. Those with reduced immune function are at increased risk for developing JON²².

Of special interest and concern recently pertaining to JON is the increased use of a category of drugs called Bisphosphonates. These drugs are commonly prescribed for osteoporosis and for other diseases such as multiple myeloma. A recent Medline search in June of 2007 on the topic of Bisphosphonates and JON yields over 450 articles in peer reviewed journals showing an increased risk of developing JON following trauma, infection, or surgery of the jawbones. This class of drugs decreases the turnover rate of bone. Recent research as shown in peer-reviewed journals is showing alarming rates of JON when patients, either on current regimens of these drugs or having taken them in the

¹⁸ Haley B. Characterization and identification of chemical toxicants isolated from cavitation material and infected root canal teeth; in situ testing of teeth for toxicity and infection. Proceedings of Annual Meeting, International Academy of Oral Medicine and Toxicology; San Diego, California; 1997.

¹⁹ Ali M, et al. Curriculum for Doctorate of Integrative Medicine. Capital University of Integrative Medicine; Washington, DC; 2000.

²⁰ Glueck CJ, McMahon RE, Bouquot JE, Rabinovich B: Thrombophilia, hypofibrinolysis, and osteonecrosis of the jaws. *Oral Surg Oral Med Oral Path* 1996; 81:557-566.

²¹ Bouquot, JE, McMahon RE: Neuropathic pain in maxillofacial Osteonecrosis. *J Oral Maxillofac Surg* 2000; 58:1003-1020.

²² Brown P, Crane L: Avascular Necrosis of Bone in Patients with Human Immunodeficiency Virus Infection: Report of 6 Cases and Review of the Literature. *Clinical Infectious Diseases* 2001; 32:1221-1226.

past, have oral surgery²³²⁴²⁵. The IAOMT believes these findings should be a major concern for the dental profession. Having this knowledge is essential so that dentists will be cognizant of the need to be thorough in checking the medical and pharmacological history of patients prior to performing invasive surgical procedures.

Education of our professional peers is necessary in order to understand the necessity for testing our patients for genetic predisposition of reduced osseous blood flow. Dissemination of information regarding laboratories such as Hemex (Phoenix, Arizona), Thrombocare(Dallas, Texas), and research facilities such as Dr. Glueck's lab at the University of Cincinnati Medical Center that provide testing to determine risk factors for increased blood clotting tendencies in the osseous tissues is necessary²⁶. Knowing and reviewing risk factors from the environment, medicines, and genetics, as well as previous medical and dental treatments is essential. The need for proper pre and post surgical therapy and proper techniques to be used in performing extractions and other osseous surgeries is indicated. Providing information to the patients regarding post surgical nutrition, blood flow maintenance, and prevention is also needed. Educating our Dental Boards and national dental agencies regarding the current state of research in JON is essential. If decisions are made using out of date information and holding practitioners to dated standards of care, then no basis for continuing research, understanding, and treatments will be forthcoming for our patients.

The IAOMT urges the dental, medical, and research communities to continue applying the scientific method in order to diagnose, treat, educate, and ultimately prevent the occurrence of Human Jawbone Osteonecrosis (JON).

²³ McMahon RE, Bouquot JE, Glueck DJ, Spolnik KJ, Adams WR: Osteonecrosis: a multifactorial etiology. *J Oral Maxillofac Surg.* 2004; 62(7):904-905.

²⁴ Marx RE, Sawatari Y, Fortin M, Broumand V: Bisphosphonate-induced exposed bone (osteonecrosis/osteopetrosis) of the jaws: Risk factors, recognition, prevention, and treatment. *J Oral Maxillofac Surg.* 63:682k-689; 2005.

²⁵ Migliorati CA, Casiglia J, Epstein, Jacobsen PL, Siegel MA, Woo SB: Managing the care of patients with bisphosphonate-associated Osteonecrosis. *JADA.* 136: 1658-1668; 2005.

²⁶ Bick RL: Disorders of Thrombosis and Hemostasis. *Clinical and Laboratory Practice.* Roger Bick (ed). Third ed., Philadelphia, Pa.:Lippincott Williams and Williams; 2002