



AAE POSITION STATEMENT

The following statement was prepared by the AAE Research and Scientific Affairs Committee to address issues being raised by some endodontic patients. AAE members may download a copy of this position statement at www.aae.org/guidelines and may photocopy it for distribution to patients or referring dentists.

NICO LESIONS

NEURALGIA-INDUCING CAVITATIONAL OSTEONECROSIS

The NICO lesion (Neuralgia-Inducing Cavitational Osteonecrosis, also known as Ratner's bone cavity) was first described in dental literature in 1920 by G.V. Black.¹ However, the concept of NICO gained notoriety decades later when it was used to describe bony lesions associated with symptoms characteristic of trigeminal neuralgia-like facial pain.² The concept has been expanded to explain the histopathologic properties of the lesion including coagulopathies with bone marrow ischemia and autoimmune alterations.³⁻⁶ Due to its indefinite disease characteristics with unclear etiology and pathogenesis, there have been growing doubts regarding whether NICO is a distinct disease entity.⁷⁻⁹

NICO lesions have been found to be difficult to diagnose.^{6,10,11} The suspected lesions sometimes present very subtle radiographic changes only detectable by advanced imaging techniques such as Technetium-99m scan, thin-sliced spiral computed tomography scans or ultrasonic scans with many false negative diagnostic results.^{12,13} The overall prevalence of suspected NICO is unknown, but it has been reported to be sexually dimorphic with a 3:1 female predilection.¹⁰

The etiology of NICO is unclear. However, it has been suggested that it includes osteomyelitis secondary to bone marrow ischemia, hypercoagulopathies and autoimmunity evidenced by the presence of anticardiolipin antibodies, thrombophilia, hypofibrinolysis and anti-peripheral nerve myelin antibodies.³⁻⁵ Recently, it was reported that the genetic mutation (endothelial nitric oxide synthase) might be associated with NICO.¹⁴ Although odontogenic infections have been suggested as initiators based on anecdotal case series, there have been no scientific studies that have demonstrated a causative relationship between endodontic therapy and the formation of NICO.

Despite the lack of knowledge regarding the true existence of NICO lesions, aggressive treatment that includes decortication and curettage of the bony tissues has been recommended.¹⁵ Noteworthy: patients often require multiple surgical procedures to achieve some pain relief, which may take several months. However, long-term assessment of the intensity and recurrence of symptoms following these surgical interventions has not been evaluated in randomized clinical trials. In addition, NICO has a strong tendency to recur and to develop in other jawbone sites.¹⁵

Some patients with long, frustrating histories of pain associated with endodontically treated teeth have been presented the treatment option of tooth extraction followed by periapical curettage in an attempt to alleviate pain. There are a number of non-odontogenic orofacial pain conditions including, trigeminal neuralgia (i.e. tic-douloureux), atypical odontalgia, myofascial pain, among others, that may coexist with bony lesions but are unrelated in pathogenesis. Thus, the American Association of Endodontists cannot condone surgical interventions intended to treat suspected NICO lesions. Even when a NICO lesion is suspected to be associated with an endodontically treated tooth, no surgical procedures should be performed until orofacial pain specialists confirm the diagnosis. It is also recommended that the treatment be performed and followed up by the orofacial pain specialists.⁹ In addition, the practice of recommending the extraction of endodontically treated teeth for the prevention of NICO, or any other disease, is unethical and should be reported immediately to the appropriate state board of dentistry.

References

1. Bouquot JE. G.V.Black's forgotten disease: NICO (neuralgia-inducing cavitation osteonecrosis).The Maxillofacial Center: Morgantown, West Virginia, 1994
2. Bouquot JE, Roberts AM, Person P, Christian J. Neuralgia-inducing cavitation osteonecrosis (NICO). Osteomyelitis in 224 jawbone samples from patients with facial neuralgia. Oral Surg Oral Med Oral Pathol. 1992;73:307-19
3. Glueck CJ, McMahon RE, Bouquot J, et al. Thrombophilia, hypofibrinolysis, and alveolar osteonecrosis of the jaws. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1996;81:557-66.
4. Gruppo R, Glueck CJ, McMahon RE, et al. The pathophysiology of alveolar osteonecrosis of the jaw: anticardiolipin antibodies, thrombophilia, and hypofibrinolysis. J Lab Clin Med 1996;127:481-88.
5. McMahon R, Boquot J, Mahan P, Saxen M. Elevated antimyelin antibodies in patients with maxillofacial osteonecrosis (NICO). J Oral Pathol Med 1998;27:345-46.
6. Boquot JE, McMahon RE. Neuropathic pain in maxillofacial osteonecrosis. J Oral Maxillofac Surg 2000;58:1003-20.
7. Zuniga JR. Challenging the neuralgia-inducing cavitation osteonecrosis concept. J Oral Maxillofac Surg 2000;58:1021-28.
8. Sciubba JJ. Neuralgia-inducing cavitation osteonecrosis: a status report. Oral Dis 2009;15:309-12.
9. Klasser GD, Epstein JB. Neuralgia-inducing cavitation osteonecrosis: a possible diagnosis for an orofacial pain complaint? J Am Dent Assoc. 2011;142:651-3
10. Ratner EJ, Langer B, Evins ML. Alveolar cavitation osteopathosis. Manifestations of an infectious process and its implication in the causation of chronic pain. J Periodontol 1986;57:593-603.
11. Segall RO, del Rio CE. Cavitation bone defect: a diagnostic challenge. J Endod 1991;17:396-400.
12. Bouquot JE, Adams W, Spolnick K, Deardorf K. Technetium-99 m MDP (tech99) radioisotope scans and bone biopsies in 56 patients with chronic facial pain (abstract). Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001;92:543.
13. Bouquot JE, Spolnick K, Adams W, Deardorf K. Technetium-99mTc MDP imaging of 293 quadrants of idiopathic facial pain: 79% show increased radioisotope uptake. Oral Surg Oral Med Oral Pathol Oral Radiol. 2012;114:83-92.
14. Glueck CJ, McMahon RE, Bouquot JE, Khan NA, Wang P. T786C polymorphism of the endothelial nitric oxide synthase gene and neuralgia-inducing cavitation osteonecrosis of the jaws. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010;109:548-53.
15. Bouquot JE, Christian J. Long-term effects of jawbone curettage on the pain of facial neuralgia. J Oral Maxillofac Surg 1995;53:387-97.