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# NICO Lesions Neuralgia-Inducing Cavitation Osteonecrosis

## AAE Position Statement

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

NICO lesions have been found to be difficult to diagnose.<sup>6, 10, 11</sup> 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.<sup>12, 13</sup> The overall prevalence of suspected NICO is unknown, but it has been reported to be sexually dimorphic with a 3:1 female predilection.<sup>10</sup>

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.<sup>3-5</sup> Recently, it was reported that the genetic mutation (endothelial nitric oxide synthase) might be associated with NICO.<sup>14</sup> 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.<sup>15</sup> 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.<sup>15</sup>

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. ticdouloureux), 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.<sup>9</sup> **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.**

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