IABDM Position Paper on Root Canal-Treated Teeth

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Controversy surrounds the removal of teeth with root canal-treatment, teeth that are diseased with an abscess or exposed nerve. There are four options:

1. Do nothing.
2. Root canal-treatment.
3. Re-treatment of the existing root canal-treated tooth.
4. Extraction of the tooth with the proper cleaning of the tooth socket and appropriate grafting of the site.

According to the American Association of Endodontists, "There is no valid, scientific evidence linking root canal-treated teeth and disease elsewhere in the body. A root canal is a safe and effective procedure."[1] At first glance, this statement seems to settle the issue once and for all. But where are the facts to back it up?

There is a significant and growing body of compelling evidence linking root canal-treated teeth to systemic disease. Much of it has been published in peer-reviewed endodontic, periodontal, dental, and medical journals, and has even reported in daily newspapers.

Early Research on Root Canal Toxicity

Early in the 1900s, a group of medical and dental researchers independently saw an unmistakable connection between systemic disease and various bacteria. These pathogens seemed to originate from oral sources in and around periodontally involved teeth, infected teeth, root canal-treated teeth, and extraction sites. Early, important researchers in this area include

- Dr. Charles Mayo, founder of the Mayo Clinic.
- Dr. Frank Billings, past President of the American Medical Association and creator of the Council on Medical Education, "which brought about the standardization of medical education in the United States" in the early 1900s.[4]
- Dr. Weston Price, founder of the research institute of the National Dental Association (which became the American Dental Association) and chair of the NDA from 1914 to 1928.[5,6,7]
- Dr. Edward C. Rosenow, a prolific researcher who consistently produced well-documented works, nearly 300 articles between 1902 and 1958.

Rosenow in particular "built upon two venerable medical concepts: (a) the concept of oral focal infection, whereby distant and/or generalized diseases have been attributed to the dissemination of microorganisms or their toxins through the bloodstream from an oral "focus" or reservoir; and (b) the ability or perhaps even tendency of microorganisms to exist in different phases as a result of dissociation or mutation, depending on environmental conditions.[8]

All four of these clinicians, three physicians and a dentist, independently conducted thousands of experiments implanting extracted root canal teeth from patients who suffered from a multitude of diseases. In every case, the experimental animal (rats or mice) became ill with the same disease the patient had suffered.

Perhaps the most famous research was done by Dr. Weston Price. (After a 16-year old boy had died of endocarditis two weeks after Price had performed root canal therapy, Price successively implanted that same tooth into two hundred rabbits. All died with endocarditis.

The 16-year old boy was his son. Dr. Price worked furiously to find a way to make root canals safe. This research was summarized in his two volume work, *Dental Infections, Oral and Systemic* and *Dental Infections and the Degenerative Diseases*. After 25 years of research, he concluded**: There was no viable way to sterilize a root canaled tooth.**

All this research was performed before the advent of antibiotics, which prevented infections from spreading and killing the advancing organisms causing the disease. Unfortunately, we do see these organisms express themselves over time but not always in the patient's mouths.

These men had no hidden agendas. They only wanted to expose the truth.

In the 1930s, approximately three years after Price's death, Dr. W. L. Holman wrote an article to dismiss all the research of Price, Billings, Mayo, and Rosenow, doing so **without performing any bacteriological research or experiments himself.** Holman's dishonest treatment of Rosenow's work in particular was clearly self-motivated and wrong.[9] The wholesale dismissal of Dr. Rosenow's in no small part seems attributable to a clearly fraudulent misrepresentation of his research results.[10, 11]

The discrediting of the oral-systemic connection has had an impact on modern dentistry for over eighty years.

Over the next couple of decades, Holman's portrayal came to serve as the indispensable foundational citation for a body of incestuously cross-referenced literature,[12] which confronted Dr. Rosenow's otherwise unassailable work. This body of contrary literature continues to undermine and influence modern medical and dental attitudes, theory and practice, establishing Holman's deception as probably the grandest fraud in the history of medicine, if not science.[13]

Crossing the Research Gap

One article in the *Journal of Endodontics*' January 1982 special issue try to make a case that a pulpless tooth is not a dead tooth. It still has a definite and vital relationship with the surrounding tissue; the author insists; the life of the tooth depends on the attachment apparatus, i.e., the periodontium and adnexa. In the words of Dr. Grossman and Dr. Marshall,

> The life of the tooth is dependent upon the integrity of the periodontal membrane and not upon the integrity of the pulp…. If a pulpless tooth were a dead tooth, it should be exfoliated since the body does not tolerate dead tissue. That a pulpless tooth is not dead may be quickly demonstrated by an attempt to remove such a tooth without an anesthetic.[13, 14, 15, 16]

Of course, these doctors had everything to gain and everything to lose if the root canal-treated teeth were declared dead and unhealthy.

What is the current scientific literature, peer-reviewed articles connecting periodontal disease, [17, 18] root canal-treated teeth, and ischemic osteonecrotic or chronic avascular necrotic bone lesions connecting these conditions with systemic disease? Today, research on both periodontal disease bacterial microbiology [19,20] and toxicity of root canal-treated teeth [21] have been published, using advanced biopsy techniques ranging from polymerase chain reaction technique (DNA) to the Limulus amoebocyte lysate (LAL) assay, quantitative kinetic

chromogenic LAL assay (KQCL) and kinetic turbidimetric LAL assay (Turbidimetric), with the exception of the histological techniques. [22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33]

There is a lack of peer reviewed articles connecting histological analysis and DNA testing of microorganisms present. In fact, there is very little incentive for researchers to investigate an established dental procedure that generates over $22,900,000,000.00 annually[34] in the United States of America* for fear of retribution by established dental institutions, whose membership consists of governor-appointed positions recommended by their state dental associations and state dental boards, the American Dental Association, as well as organizations such as: the American Association Of Endodontists, the American College of Oral and Maxillofacial Surgeons, the American Academy of Periodontology, and the American Dental Association.

It is safe to conclude that few if any members of state dental boards have any idea or concept of biological, holistic, or integrative dentistry.

Practical Matters for the Biological, Holistic, or Integrative Dentist

Exemplary **record keeping** is certainly a cornerstone of your defense if a state board, attorney or insurance company asks why you extracted a "perfectly healthy" root canal-treated tooth. Do not trust a board member to interpret your findings and understand what you are doing. **You have to write out all the information.**

In your records you must list

1. The patient's chief complaint.
2. Why the patient wants their root canal-treated teeth removed.
3. Any experience of pain, infection, or a systemic-related condition the patient has had.
4. Radiographic (both CBCT and 16 to 18 full mouth series), EAV, and/or quantitative ultrasound (QUS or CAVITAT™) documentation of dental conditions.
5. A signed and dated informed consent form from the patient and a written statement why they want their root canal-treated teeth (past extraction sites and Titanium implants) removed.
6. The patient's expression of pain level or statements like "After I had my root canal done,I got sick, and I believe these two situations are related."

Chart the facts: existing conditions, missing teeth, restorations, periodontal health, bone health oral cancer screening, TMJ condition, and sinus health. Include the condition of each tooth number or area: failed root canal-treated tooth with granulation tissue, cracked tooth, etc.

Note why you recommend extraction. If the patient had persistent pain and discomfort despite root canal treatment and an absence of positive periapical findings on radiograph, write it in the record. Why is it a failure? Pain? Suppuration? Mobility? Fracture? Un-restorability?

Record your diagnosis. This is where the board will say they "gotcha" because until the biopsy is returned, you may only give possibilities (i.e., differential diagnosis) and not a formal diagnosis. If you use a DNA biopsy report, many dentists do not get the connection between a histological report or a DNA report.

Therefore, state possible differential diagnoses of

1. AVN.
2. Asymptomatic chronic fibrosis.

3. Failed root canal due to radiolucency at the apex of the tooth, no pain.
4. Abscess present with draining fistula.
5. Non-supportive osteomyelitis.

In his book *Six-foot Tiger, Three-foot Cage*, Dr. Felix Liao states the case for connecting the oral cavity to the rest of the body, with and without endodontic care. The book supports the perio-endo-systemic connections:

- A 2016 study in *PLoS Medicine* showed the link between periodontitis (gum disease) and memory decline. "The presence of periodontitis at baseline," it said, "was not related to baseline cognitive state but was associated with a six fold increase in the rate of cognitive decline…." [35]

- Bacteria from the mouth have been shown to spread to the rest of the body. For instance, people with periodontal disease have double or triple the risk of having a heart attack or stroke.[36]

- Oral bacteria have been found in heart attack clots. "Dental infection and oral bacteria, especially viridans streptococci, may be associated with the development of acute coronary thrombosis," wrote researchers in the journal *Circulation*. [37]

- One study found that DNA from endodontic (root canal) bacteria was found in 56% of 36 samples of heart attack clots. Periodontal bacteria was found in 47% of those samples. The authors concluded that "dental infection could be part of pathophysiology in intracranial aneurysm disease [stroke]." [38]

- Bacterial DNA was detected in 21/36 (58%) of specimens. A third of the positive samples contained DNA from both endodontic and periodontal bacteria. DNA from endodontic bacteria were detected in 20/36 (56%) and from periodontal bacteria in 17/36 (47%) of samples. Bacterial DNA of the *Streptococcus mitis* group was found to be most common. [39]

Upon the arrival of biopsy reports, a diagnosis may be stated or the personal opinion given on the patient's situation. This maybe entered at the time you review patient results or in a letter to the patient, with a copy placed in the patient's chart.

State dental boards have no idea how to interpret a DNA report because it does not list a diagnosis like a histology report does. Therefore, they will argue the validity of the biopsy. There are new insurance dental codes that distinguish between Histological Reports (D7285) and DNA (0422) Reports.[35] **Always have a biopsy of either type for all surgical procedures that include surgery of avascular necrosis sites, removal of root canal-treated teeth, bone lesions, or soft tissue excisions.**

Protocol for the Removal of Root Canal-Treated Teeth

In *Root Canal Cover-up*, Dr. George E. Meinig explains the method he has suggested since 1993. There have been many good suggestions added to his basic protocol, but his lays the foundation for the basics.[36] The basic protocol is also recommended for the extraction of non-root canal-treated teeth, but it is not the only way to prepare an extraction site.

Once the tooth has been extracted and tooth, tissues and blood samples have been collected for biopsy, a #8 or #10 round burr is used to remove one to two millimeters of the entire bony socket, including the apex area.

Of course, there are exceptions to every rule. In mandibular third and second molar areas, one should know exactly where the neurovascular bundle is and the mental foreman/nerve. On occasion, I avoid cleaning the lower one-third of the socket to avoid neurological damage.

In the upper arch, the round burr is started in the apex area and brought to the surface, avoiding the possibility of going directly into the sinus. It is very common to extract a failed root canal-treated tooth or abscessed tooth and discover an oral-antral fistula exists into the sinuses. If this happens, a protein rich fibrogen (PRF) or collagen membrane can be inserted into the apex of the socket or in the sinus via the opening and a bone augmentation material, such as artificial bone, cadaver bone, autologous bone, or a beta-tri-calcium phosphate paste may be placed in the sinus area and socket. A similar membrane may be secured in the socket, sutured into place by suturing the tissues in such a manner to secure the healing site. Make sure there is a good blood flow into the area by not injecting an anesthetic with epinephrine, unless there is a contraindication.

Whenever a lower third molar appears to be entangled around the neurovascular bundle, always refer that patient to an oral surgeon for removal. If the surgeon encounters a problem, their license makes it less likely they will be involved in a board complaint or legal action. Never attempt to be a dental hero.

The purpose of removing the first 1 to 2 mm of bone is to perform a partial ostectomy squestrectomy for removal of the periodontal ligament (PDL), non-vital, loose, or sloughed-off dead bone caused by infection or reduced blood supply. aiding healing of the site. As we learned in school; the PLD has four purposes:

- To secure the tooth to jawbone.
- To facilitate fluid flow through the dentinal tubule structures. When the tooth is “depressed” into the socket, it acts as a cushion. When the pressure is released, the tooth moves back to its original position and acts as plunger to the fluids in the dentinal tubules, creating pressure to pull the liquids out from the tooth’s inner structures into the PDL and the interstitial spaces.
- To give feeling without pain.
- To prevent bone growth. (Teeth are considered bone by the body.)

Ligaments allow freedom of movement between bones. So if a tooth is removed but the PDL remains in the socket, the body reacts as if the tooth is still present. It prevents the creation of capillary beds which bring in the blood vessels establishing circulation. Without proper circulation, osteoblasts and osteoclasts cannot be generated and no new bone will grow. A lesion is created, and an anaerobic environment is established for bacteria, viruses, and toxins to live in and thrive.

With root canal teeth, endotoxins have been found 100% of the time,[37, 38] This means the PDL and adjacent bone were exposed to toxins and should be completely cleaned.

The basic principles of cleaning the jawbone socket are recognized in the American Dental Association’s Dental Procedures Codes 2017. The principle of cleaning the surgical sites is the same for a root canal-treated tooth, a non-root canal tooth, and areas of avascular necrotic lesions.

D7140: extraction, erupted tooth or exposed root (elevation and/or forceps removal). [Includes removal of tooth structure, minor smoothing of socket bone, and closure, as necessary.]

D7210: extraction, erupted tooth requiring removal of bone and/ or sectioning of tooth, and including elevation of mucoperiosteal flap if indicated. [Includes removal of tooth structure, minor smoothing of socket bone, and closure, as necessary.]

D7550: Partial ostectomy/squestrectomy [for removal of non-vital, loose, or sloughed-off dead bone caused by infection or reduced blood supply].[40]

While the procedure is being performed, the area should be irrigated with copious amounts of sterile saline water via your surgical hand piece or a separate water syringe.

While cutting the bone, the PDL and toxins are removed and the bone is "perturbed" or stimulated. As the blood vessels are established in the socket or other bony lesions, this perturbation of the bone stimulates a change from osteocytes to osteoblasts. The latter are the cells that generate new bone formation.

After the socket has been cleaned, it is recommended to prepare it. *There is no one set method to perform any or all of the suggestions below. Whatever works in the specific, individual case is appropriate.*

1. Fill the socket with a non-vasoconstrictor (no epinephrine) local anesthetic. Allow the liquid local anesthetic to set for about thirty (30) seconds, then gently remove most of the anesthetic, leaving a small amount to continue stimulating osteoblastic activity.

2. Irrigate the surgical site with sterile saline water, hydrogen peroxide (and set for 30 seconds), ozonated water (and left to set for 1 minute), or other preferred cleaning solutions.

3. Rinse the site with another antiseptic solution.

Once the surgical site has been cleaned, place your bone augmentation material(s) or PRF/PRP tissues along with primary closure via suturing the site. Each practitioner needs to decide whether to place anything into the surgical site. Materials used by many of our members include: nothing, sterilized cadaver or xenograft materials, synthetic bone; and protein rich fibrogen or plasma rich protein, with or without the addition of homeopathic remedies.

Some biological and integrative dentists will simply clean the site, placing nothing because their patients often suffer from autoimmune conditions. Their experience with this type of patient is less is more.

All surgical sites should be closed as much as possible by suturing the surgical site with an absorbable or Teflon suture for better healing and less build-up of plaques. Addition of homeopathic remedies, PRF, PRPP liquids, ozone, or another product may be added to the sites to aid in healing. For postoperative care, gentle mouth swishing with salt water or a non-toxic mouth wash is recommended.

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