Biological Dentistry

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Biological dentistry is a more bio-compatible approach to oral health and offers alternative therapy to the conventional dentistry. It regards the patient as a whole and does not treat the mouth in isolation. What happens to the teeth and gingiva has an impact on the rest of the body, and conversely, a systemic condition can affect oral health. Teeth are often considered as a gateway to the general state of health. It involves a more organic approach to care, with less invasive protocols and materials. Biological dentists always seek the safest, least toxic way to accomplish the mission of therapy and all the goals of modern dentistry. Biological dentistry describes a philosophy that can apply to all facets of dental practice and healthcare in general.

Oral ecology

The human mouth contains around 500-1,000 different types of bacteria with various functions as part of the human flora and oral microbiology. Individuals who practice oral hygiene have 1,000 to 10,000 bacteria living on each tooth surface, while clean mouths can have between 500 million and one billion bacteria on each tooth. Some of the bacteria in our mouths are harmful and can cause serious illness, while others are beneficial and prevent disease. Periodontal treatment is an essential part of biological dentistry to prevent diseases such as diabetes, cardiovascular disease, rheumatoid arthritis, chronic bone disease, Alzheimer’s disease, and others.

Immune system

The biological dentists will give the patient nutritional advice and prescribe vitamins and food supplements to enhance the immune system for a better outcome for therapy. For example, in biological dentistry, it is commonly known that a high vitamin D level and low LDL cholesterol are key factors for a better outcome for bone surgery and implant osseointegration.

Dental mercury

An amalgam restoration is of great concern in biological dentistry. While amalgam is because 95% of it consists of mercury, which is one of the most toxic non-radioactive elements on the planet. Therefore, biological dentists always seek the safest, least toxic way to accomplish the mission of therapy and all the goals of modern dentistry. Biological dentistry describes a philosophy that can apply to all facets of dental practice and healthcare in general.

Metals and oral galvanism

Biological dentists believe that placing metal and other foreign materials in the teeth and gingiva may have unintended consequences. That is why biological dentists only offer metal-free alternatives such as ceramics or composites. Composites are also chosen with care, as they should be non-toxic, non-allergenic, and easy to use. Consequently, they are free of HEMA, bis-GMA and TEGDMA.

A bridge framework and titanium implants are replaced by a zirconia alternative, which offers versatility and great osseointegration and a biocompatible ceramic material free of metal. These types of implants prevent complete assimilation into the jawbone and the surrounding gingiva.

Aside from their ability to provoke immune reactivity, metals are electrically active. Oral galvanism has been discussed for well over 100 years, but dentists have tended to ignore it as a small inconvenience. Biologically, macromolecules can influence the rate of corrosion by interfering in different ways with anodic or cathodic reactions. When combined with mechanics (such as static load causing dynamic loading or wear) and inflammation, corrosion is intensified. The corrosion behaviour of a metal in non physiological in vitro studies versus physiological in vitro studies and versus in vivo studies may vary dramatically. The corrosion control in vivo is currently limited to careful design, proper material selection and surface modification. The effectiveness of coatings may be limited in vivo due to wear.

Endodontic treatment

Endodontically treated teeth are dead tissue left in the body. This type of procedure is not found in any other medical discipline. Inflammation is common at the root apex, as it is almost impossible to clean thoroughly in this area. Even the best endodontic specialist can never achieve a complete cleaning of bacteria. Accessory lateral channels and the endodontic-periconical connection via the dentinal tubules remain sealed. Thus, bacteria harboured in root canal areas such as intratubular, dentinal tubules and ramifications may evade disinfection. These pathogenic bacteria produce toxic and potentially carcinogenic hydrogen sulphide compounds (thiosulfate and mercaptans) from the amino acids cysteine and methionine as by-products of anaerobic metabolism. Studies have revealed several different strains of bacteria found in endodontically treated teeth with periapical periodontitis. Enterococcus faecalis and yeast, mainly Candida albicans, are very resistant and have been repeatedly identified as the species most commonly recovered from root canals undergoing retreatment, in cases of failed endodontic therapy and with persistent infections. The predominance of Gram-negative anaerobes associated with endodontic infections and evidence of cytotoxic production in inflamed pulp and periapical granulomatous tissue have shown an elevation of systemic levels of inflammatory markers in endodontic patients which could have an impact on distant organs.

Since the human body and its robust immune system can combat relatively well, and conventional medicine does not consider the body to be an integrative system, and focuses much more on its parts, the link between the oral cavity and symptoms elsewhere in the body has not been well established. The biological dentists take this relation very seriously and watch endodontically treated teeth closely. The best way to diagnose inflammation of the root apex is to rely on a radiographic imaging (CBCT). It has been shown that in many cases it can detect periapical periodontitis where a 2-D radiograph shows a sound picture.

Cavitation or osteonecrosis

Cavitation or ischaemic osteonecrosis is a hole in the jawbone, occurring mainly after a tooth extraction that has not healed correctly. Dr Greene Vanderbilt Black, one of the found fathers of modern dentistry, described this process as early as 1915. Pathogens, a biofilm formation of bacteria, are also present in this dead tissue and release highly toxic waste products that can pass into the bloodstream and have detrimental effects on the heart, kidney and joints, as well as the nervous, vascular and endocrine systems.

Recent work in the field of facial pain syndromes and NICO has led to the realisation that the jawbones are a frequent site of ischaemic osteonecrosis. This can be called aseptic necrosis of the jaw. As a result, many extraction sites that appear to have healed have actually not healed completely. It may trigger pain in other parts of the face and head, and in distant parts of the body. Even though most of these sites present with no symptoms at all, pathological examination reveals a combination of dead bone and slowly growing anaerobic pathogens in a mixture of highly toxic waste products where there otherwise appears to be proper healing.

The blame for these infections has been placed on the periodontal ligament left behind after extraction. However, it is most likely that cavitation occurs as a result of a combination of initiating events, predisposing risk factors and environmental factors. Notably, if patients have infections after their extractions or experience traumatic events such as dry sockets, there is a higher likelihood of cavitation development. Usually this is the result of a combination of dead bone and slowly growing anaerobic pathogens in a mixture of highly toxic waste products where there otherwise appears to be proper healing.

Biological Dentistry Today

Dentistry is a rapidly evolving field. Especially, biological dentistry is always seeking the latest research for a better and safer approach. In the past, it was revolutionary to be able to restore a tooth instead of just pulling it out; amalgam, gold and dental composites were, at the time, innova-
tive materials and a better option than extraction. But today, we can do better dentistry in a less toxic, more individualised, more integrated and more environmentally friendly way than ever. Biological dentistry is a mindset more than a specialty: It could also be called advisory dentistry or common sense dentistry. When dentists choose to put biocompat-
ibility first, they can look forward to practising effective dentistry while knowing that patients are provided with the safest experience for their overall health.

References

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