

## Severe Long-term Knee Pain and Limp Mitigated with Biotransducer

### Case Study of Patient with Possible Ahlback Disease

A 71-year-old diabetic patient with hepatitis C presented with a history of right knee osteoarthritis due to a fracture suffered 20 years ago. The patient came limping in to the radiology department to investigate his severe right-sided knee pain that hindered his gait.



The initial MRI images, taken Oct. 14, 2014, showed severe osteoarthritis, complete cartilage loss in the medial femoral condyle, osteoarthritic changes, and marked edema in the medial femoral condyle, suspicious of “Ahlback disease” (spontaneous osteonecrosis of the knee).

After discussing therapeutic options with the patient, which in his case are limited due to his medical condition and age, the option of pulsed electromagnetic frequency therapy using Tennant Biotransducer®, used in conjunction with the Tennant Biomodulator®, was suggested as a free-of-charge trial. Beginning Nov. 3, 2014, the patient was treated with daily, in 30-45 minutes sessions.

The patient reported reduction in pain and swelling of the knee and reduction in limping during the period of therapy. An MRI scan done on Dec. 2, 2014, documented any differences.



The MRI images shows an 80% to 90% complete resolution of the medial femoral condyle edema and the normal bone marrow signal return almost 90% to normal. The lack

of significant changes in the tibia is simply because the position of the Biotransducer was concentrated for almost one month mainly over the medial femoral condyle region, the focus of pain. The patient is scheduled for another one-month therapy trial with concentration over the tibia, and another MRI scan is scheduled for the end of December 2014.

In each of the “before” and “after” MRIs (at right) the reduction in edema is clearly apparent. In addition, the reappearance/thickening of cartilage is visible.

### **Tennant Biotransducer® and Biomodulator® Technology**

A transducer is a device that converts one type of energy to another. The Tennant Biotransducer® uses a combination of technologies including actuation, piezoelectricity, semi-conduction and modulation to create a field that will transmit the frequencies of the Tennant Biomodulator®, a microcurrent device, past the skin and into the tissue more efficiently. The Biotransducer may be used over injured tissue, an acupuncture point or near difficult-to-access tissue. This hand-held, no-touch unit plugs into the accessory port of the Tennant Biomodulator®. When powered by the Biomodulator, it addresses the underlying cause of pain and inflammation without drugs or invasive medical procedures. It does not need skin contact and is able to transmit voltage and frequency through clothing.

The Tennant Biomodulator® uses specific, patented microcurrent technology to encourage the body to use its own resources to produce a healing outcome. Microcurrent has been shown <sup>1,2,3,4</sup> repeatedly to reduce pain and improve a variety of health conditions. While basic microcurrent technology has been around for more than 40 years, the Biomodulator uses a proprietary set of frequency patterns developed by Jerry Tennant, MD.

These patterns or “modes” are delivered by patented microchips to produce very specific outcomes. These hand-held Biomodulator devices are FDA-cleared for the symptomatic relief and management of chronic, intractable pain and adjunctive treatment in the management of post-surgical and post-traumatic pain. This microcurrent device uses different neural paths and a different wave form than a traditional TENS device. Rather than just masking pain, the Biomodulator targets C-fibers of the nervous system (most TENS devices work on the A- and B-fibers). C-fibers stimulate the production of neuropeptides and other regulatory peptides, which the body uses to heal itself.<sup>5</sup>

The Tennant Biomodulator® device produces unique, pulsed high-voltage, biphasic damped sinusoidal microcurrent electro-stimulation designed with Dr. Tennant’s frequency modes. The Biomodulator and Biotransducer are manufactured in the U.S. by Avazzia, a Dallas-based company, exclusively for Senergy Medical Group.

### **Before and After Data Provided by Dr. Al-Tabaikh, Kuwait**

Jarrah Ali Al-Tubaikh, MD specializes in radiological diagnostics of rare disorders. He is a member of the German Board of Radiology and currently works in the Radiology Department, Sabah Hospital, Kuwait City, Kuwait.

Since Dr. Al-Tubaikh was introduced to the Tennant Biomodulator® medical device for drug-free, non-invasive pain relief along with its accessory, the Tennant Biotransducer®, and protocols of Jerry Tennant, MD, MD(H), PScD of Colleyville, Texas, USA, Dr. Al-Tubaikh has significantly improved or eliminated ongoing pain for co-workers, family and patients. He takes images before and after treatment to document changes that have taken place after Biomodulator treatment. “It is hard to argue against radiological images because the evidence is clear; it is not placebo anymore.”

**Conclusion: Drug Free, Non-invasive Pain Relief**

The differences revealed in the before and after MRIs following one month of non-invasive, drug-free treatment using the Tennant Biotransducer® in conjunction with the Biomodulator can be objectively measured, revealing dramatic, measureable changes in the structure and tissue of the knee. Dr. Al-Tubaikh also reports the male patient received immediate decrease in pain.

It is apparent that in the hands of a medical professional, the Biotransducer, coupled with the Biomodulator, provided significant pain relief for this patient from his old injury. The value of the Biotransducer, along with the Biomodulator, as tools for the physician is apparent. Medical professionals, including physicians, chiropractors, and physical and occupational therapists, would improve patient outcomes with access to these devices.

Dr. Jarrah Ali Al-Tubaikh is an internist, surgeon and well-regarded radiologist who trained in Germany (LMU Klinikum Grosshadern, Munich). He now works at a Kuwaiti-government (Al-Sabah) hospital. He has several publications to his credit, including the texts *Congenital Diseases and Syndromes: An Illustrated Radiological Guide* (Springer; 2009) and *Internal Medicine: An Illustrated Radiological Guide* (Springer; 2010).

Dr. Jerry Tennant has written several books including *Healing is Voltage, The Handbook* (2010, 3<sup>rd</sup> edition 2013) and *Healing is Voltage – Healing Eye Diseases* (2011), teaches courses, presents at medical conferences, and continues to see patients at the Tennant Institute for Integrative Medicine. Interviews can be seen on *Healing Quest* news magazine, televised on PBS.

**Sources**

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