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## Non-Vascular Edema Affecting the Bones: A Three Case Report

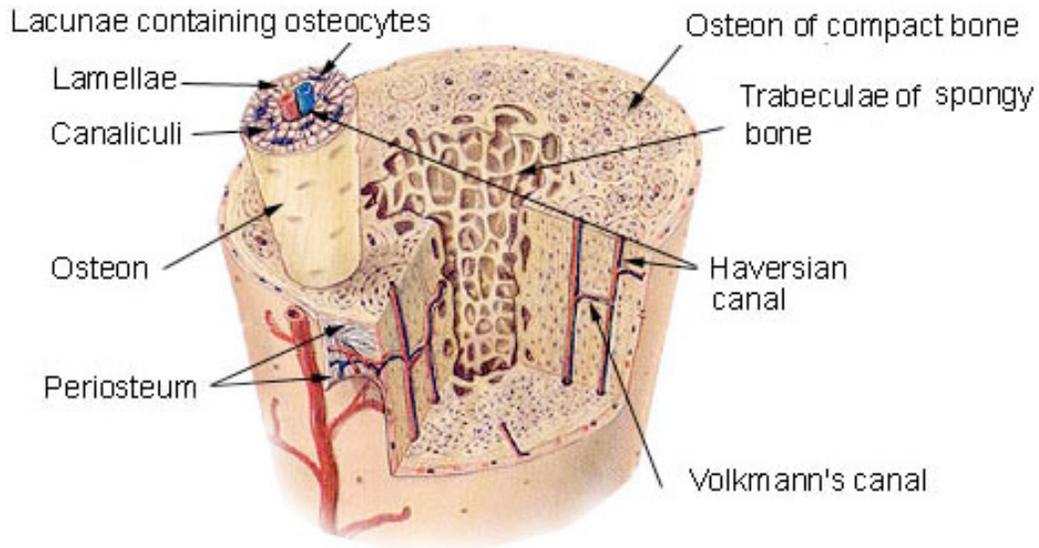
This is my third article written for this publication. In the summer 2010 edition of *Massage Matters*, I explain in some detail the phenomenon of non-vascular edema and resulting tissue degeneration. Please refer to this edition. Briefly, this condition is characterized by an expanded extracellular matrix with a paucity of blood elements and a high concentration of proteoglycans in the tissue. In this paper I'll be discussing three cases involving the long bones. The reason for writing this manuscript is to demonstrate that the nerves and the general physiology within the bones are really no different from other tissues of the body. The underlying pathology is the same. Only the symptoms are different.

To quickly summarize, if the affected body areas are stretched at their end-range then hypothetically the excess fluid will be drained from the area and a more normal blood flow will return. Tissues can be stretched because they are viscoelastic. Relatively speaking, one would think bones are rigid and therefore couldn't really undergo end range loading procedures.

This is not the case. Bones do deform under mechanical loading and an internal fluid shift within does take place.<sup>1-9</sup> I believe the periosteum will also be affected in a similar manner.

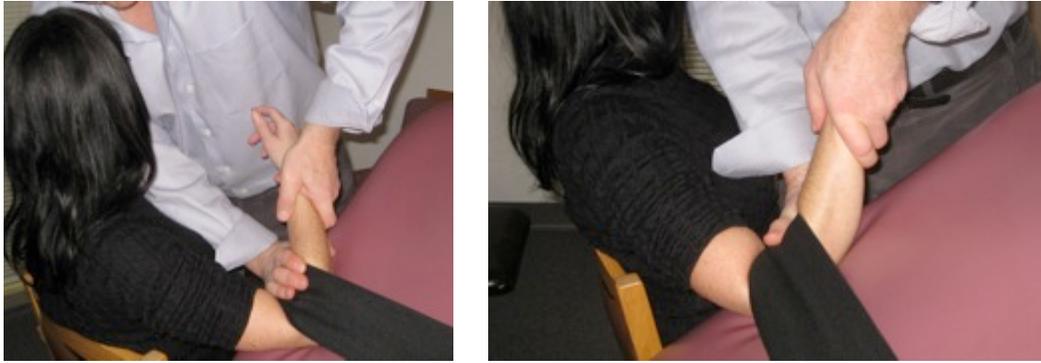
We think of the peripheral nervous system as being flexible and loose. For example, the median nerve has to adapt to various positions of the upper limb. It has to 'uncoil' and 'coil' itself depending if the subject is reaching or conversely flexing his elbow and wrist. In order to end range load and stretch this nerve the arm has to be taken into an extreme position. Since there is very little movement in the periosteum and in the bone in general, there is no need to have the same 'looseness' of the nerves within. That being the case, only a little flexion of the bone and periosteum may be enough to stretch and so drain edema from those nerves.

## Compact Bone & Spongy (Cancellous Bone)



*Fig.1 Anatomy of a typical bone.*

In November 2010, a fifty-six year old female presented with upper right radial forearm numbness, pain and stiffness. The problem began four years prior, about the time she was diagnosed with osteopenia. The condition was slowly becoming worse. Examination showed restricted excursion of the elbow in extension, swelling and tenderness to deep palpation in the common extensor area and motor weakness in dorsiflexion and radial deviation of the wrist. In her history she described a fall in 1964 where she fractured her upper radial aspect of the right forearm in three places. This fracture had to be surgically reduced at the time of injury. This lady was treated twice in November, 2010. Therapy included bending the upper radius and ulna in such a direction as to reproduce the symptoms. On December 01, 2010 she reported a 98% abatement of symptoms and disability. She had no pain on deep palpation, no swelling, exhibited a full range of motion, and exhibited full strength in her right wrist. Her diagnosis is non-vascular edema in the proximal radius and ulna resulting in her disability and caused by the fall in 1964.



*Fig.2 Mechanical loading of the upper radius and ulna.*

In November 2010 a sixty year old female presented with right hip symptoms. She suffered from constant pain, stiffness and numbness from the lateral aspect of her hip down along the anterior thigh and into the knee. She also complained of right lower back and buttock pain and stiffness. She couldn't lie on her right side, at times the right leg would give out while she was walking, and the right leg would usually feel weak while she was walking. This started in 1978 when she skied into a snow drift. It took half an hour for her to wriggle free. Afterwards she experienced moderate to severe hip pain along with bruising in the area. I treated her on two occasions in November and checked her once in early December 2010. Therapy included bending the femur in such a manner as to reproduce the symptoms. In December she reported a 75% decrease in symptoms. She can now lie on her right side, has no more sense of weakness or the leg giving out while she is walking and feels she is more active now. Her diagnosis is non-vascular edema in the right proximal femur. The treatment was end range loading of the femur.



*Fig.3 Loading the superior aspect of the lateral femur*

A seventy-seven year old lady presented January 12, 2011 with right upper arm and shoulder pain and stiffness. She had fallen and fractured her right upper humerus and shoulder joint in two places. This occurred in December, 2007. Her arm was in an immobilizer for four and a half months. For the past three years her symptoms have plateaued. She couldn't sleep on her right side, had difficulty in reaching up, felt a constant tightness in her biceps area and experienced

constant low grade pain. The treatment consisted of end range loading her upper right humerus. As of January 18, 2011 she had noticed the following improvements. She could now sleep on her right side. She could reach behind with her right arm and undo her bra. Her range of motion had improved markedly. She had no pain or achiness.



*Fig. 4 Notice the upper humerus is being loaded differently in these diagrams. Reproducing the pain during the procedure will target the tissues we want to affect.*

Many conditions involve bones. A lack of blood supply within would be an obvious cause to many chronic conditions. Consider for example degenerative arthritis of the hip. We know that a function of articular cartilage of the femoral head is the protection of the underlying bone. With degeneration, the cartilage disappears and the bone of the femoral head is susceptible to mechanical stress. This stress causes the nerves and associated connective tissue within to secrete proteoglycans and so the edema/avascularity scenario develops. Perhaps end range loading the upper aspects of the femur will alleviate the pain and disability brought on from osteoarthritis of the hip. On a personal note, my right hip has advanced OA. Loading the femur in my case dramatically eased the pain. I underwent one treatment six months ago and today still have no pain while laying down at night. Other conditions may include tendinopathies at the bone junction, medial tibial stress syndrome, old boney injuries, and so forth.

End range loading of bones fits well within the massage therapists' scope of practice. I encourage you to learn and practice these procedures.

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