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Introduction to Prolotherapy

What is Prolotherapy?

Prolotherapy is an injection technique used to treat structural dysfunctions of ligaments, joints and tendons throughout the body. These dysfunctional areas may be painful, weak, loose, or degenerated.

The affected ligaments or tendons are injected at the bone-tissue junction (enthesis or fibro-osseous junction) by a solution that directly stimulates the growth of healthy, strong tissues. The resultant strengthening of the tissue leads to an increase in stability, increase in function, and a decrease in pain. Dysfunctional joints affected by arthritis may be treated similarly, with an increase in function and a decrease in pain being noted in many cases.

The word originates from the Latin *proles*—to stimulate growth. The mechanism for this stimulation may be the inflammatory response or stimulation of growth factors, both of which initiate the healing cascade, with cellular and tissue proliferation occurring. Monocytes appear in the area within hours, fibroblast proliferation and migration occurs within 48 hours, pro-collagen deposition occurs within one week, and maturation of pro-collagen to collagen occurs by 8 weeks. In the maturation phase, water is lost, causing constriction of the tissue and tightening of weak or loose ligament, tendon or joint capsules. The tissue reaction to the proliferant solution is similar to the tissue response seen following a laceration (cut) on the body, with the initial clotting occurring, followed by the formation of granulation tissue, and ultimately by scarring and shrinking of the scar over the next year. Following prolotherapy injections, the newly formed tissue planes line up parallel with the existing tissue, while scarring results in newly formed tissue fibers in a haphazard pattern.

The solutions used are irritants of various classes, with the basis being a concentrated sugar solution. In addition to the sugar solutions, which consist of glucose and glycerin (osmotics), phenol (haptens) and sodium morrhuate (chemotactics) are used.

Is Prolotherapy new?

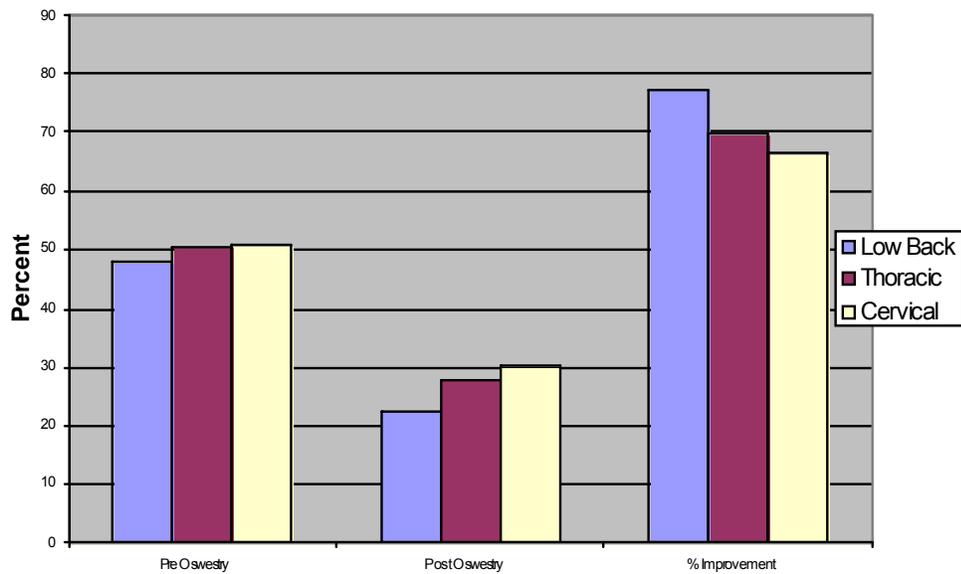
Prolotherapy originated in the late 1930's. Dr. Earl Gedney, an osteopathic physician from Philadelphia, was the first to use an injection to strengthen sacroiliac ligaments and termed it *Sclerotherapy*. Dr. George Hackett, and industrial surgeon from Canton, Ohio, active in the late 1950's,

correlated pain patterns from strained ligaments with instability. He treated thousands of patients with ligament strengthening injections which he renamed *Prolotherapy* and reported a 90% improvement. Although prolotherapy had not been popular for 30-40 years because of complications reported in 5 cases in the early 60's, resurgence in its use has taking place in the last 5-10 years. Synonyms used for the injection technique include *Regenerative Injection Therapy* and *Ligament Strengthening Injections*.

Several excellent studies published in the last few years in respected specialty journals that have shown beneficial results to prolotherapy (1,2,3,4). In addition, the Mayo Clinic Health Letter spoke positively about prolotherapy and its future.(5) There have been two review articles recently published indicating significant benefits from prolotherapy and chapters are included in two newly published pain management textbooks (6,7,8,9). In addition, an outcome study in our practice following patients who have been treated with prolotherapy injections of the spine and the extremities is currently on-going. The results have been excellent. Patients are included in the study if the proliferant injections had been completed at least six months prior to the outcome determination. Various disability indices were used, including the Oswestry index for back and neck, Lyshom Index for the knee, and Shoulder Pain Index for the shoulder. In our study over 85% of our patients reported an improvement greater than 50%. The following charts summarize our current results.

(Pre and post Oswestry disability results indicate Pre-treatment and Post-Treatment indices.)

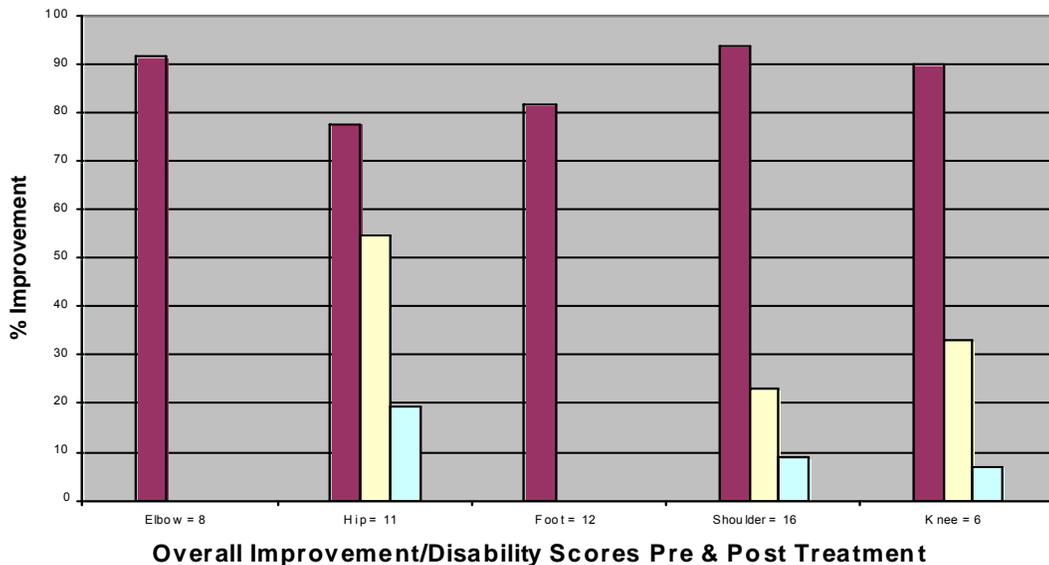
Outcome Study Spinal Prolotherapy



10/17/2005 **Low Back N=81** **Thoracic N=26** **Cervical N=37**

31

Outcome Study Prolotherapy of Extremities



Overall Improvement/Disability Scores Pre & Post Treatment

10/17/2005

32

Can there be any complications?

Prolotherapy is a very safe procedure. The risks are far less than taking NSAIDs or opioids for a lifetime to temporarily alleviate chronic pain. There is,

of course, a slight risk in any medical procedure. In prolotherapy, the risks and side effects will vary depending on the area being treated. There are some potential complications. Injections are almost always performed at the fibro-osseous junction. This is a safety factor to avoid nerves and blood vessels. Rarely, however, injection material can be deposited near nerve tissue. This may cause increased pain or temporary numbness. Other complications may include infection, abscesses, weakness, pneumothorax, allergic reactions, dizziness, or nausea.

How is prolotherapy performed?

Prolotherapy involves injecting small amounts of solution at the fibro-osseous junction into ligamentous/tendinous structures that are dysfunctional (weak, degenerative, loose, painful). Also treated are mild to moderately degenerative joints. Depending on the site and size of area involved, this usually necessitates more than one injection site. Injections are painful, often require sedation (oral or intravenous), and are performed under fluoroscopic guidance in hospital pain clinics or in a private office setting as well.

After the procedure, most patients feel a fullness and numbness in the areas injected. Often, pain is relieved for several hours because of the local anesthetic that is injected along with the proliferant. The pain will usually become quite evident several hours later and usually peaks in 3-8 hours. For the next 24-48 hours there may be considerable discomfort at the injection sites prior to the pain intensity lessening. The pain will continue to decrease over the next 3-7 days. Some patients never experience much discomfort at all. The injections are usually repeated every 2-3 weeks, with 3-4 injections being done at each area.

Is manipulative therapy and exercising done during the treatments?

Patients are encouraged to have manipulative therapy (chiropractic adjustments or physical therapy joint mobilizations) just prior to or one week after injections. After the individual injections, patients are encouraged to do regular flexibility and stretching exercises. However, they are advised to not overstress the areas injected as this may prevent proper healing from taking place. Once sufficient healing has taken place (4-5 weeks), more strenuous exercise may begin under supervision, including strengthening and stabilization exercises. Occasionally, repeat injections may be needed 3-6 months after completing the treatment if dysfunction (weakness, laxity, enthesopathy) still persists.

Are all patients with structural dysfunctions (ligament/tendon/joints) candidates for injections?

Proper patient selection is crucial to the success of prolotherapy treatment. Patients require a healthy healing potential and a strong immune system to benefit from this treatment. Good nutrition, exercise, and sleep habits are very important. Nutritional supplements including glucosamine, chondroitin sulfate, MSM, vitamin C, multi-vitamin/minerals are very beneficial. Poor prognosis is associated with patients who have primary discogenic pain or failed

fusions. Individuals who are alcohol or drug abusers, heavy smokers, have chronic illnesses, including diabetes and immunosuppressive diseases, are bedridden with chronic pain, have a true myofascial pain syndrome (fibromyalgia), have secondary gain issues, or a pain scale totally out of proportion to the clinical findings also do not do well with prolotherapy.

Are prolotherapy injections covered by insurance companies?

This depends on the insurance company. Some insurance companies will cover all or part of the treatment, pending pre-authorization.

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