

Prolotherapy: how to take care of bad tendons!

edit by Luciano Bassani, Physiatrist.

Prolotherapy is an infiltrating therapy of bad tendons and ligaments after some degenerative and traumatic events, which has the goal to take care of these bone structures.

Since the benign pain, which many people complain about, is wrongly due to a degeneration of bones and cartilages (rheumatism), I want to explain that in reality its origin is due to an alteration of capsules, tendons and ligaments, and so, we understand the interest of the prolotherapy to act deeply and specifically on these anatomic structures. Prolotherapy bases its mechanism of action on the activation of a reparative process against capsule-tendon-ligament bad structures that the body by itself is not able to recover; a pulled muscle or a distraction of tendons are the main causes of chronic pain when they are not completely recovered.



This situation, called **"insufficiency of connective tissue"**, is characterized by a very weak structure that sends messages to the nervous central system, which elaborates and transforms them in painful sensations. Prolotherapy has some medicines which are filtrated in the zone between the tendons and ligaments and that, causing a first phase of localized inflammatory reaction, stimulate in the end the reparation and the tension of bad tissues. The term prolotherapy was first used by George Hackett in 1950 who defined them **"the rehabilitation of an incompetent structure trough the generation of a new cellular tissue"**. The prefix prolo stands for proliferate. The assumption of prolotherapy is that benign pains of the column and articulations come from an alteration of ligaments and tendons that, if straighten for traumatic or degenerative reasons, do not tend to naturally regenerate, causing the rising of chronic pain. In every traumatic episode, but also for the persisting of situations of bad functions for bad posture, due to repeated stresses on tendons and ligaments, there are relations that tend to get worse instead of improving.

DISTORSION

To an important ligament distortion, for example a distortion of an ankle or knee, follows a cellular damage which in normal situations provokes a inflammation followed by proliferation and migration of fibroblasts in the first 48 hours which function is the one to deposit a new tissue in the damaged structure. This tissue, called collagen, is deposited as pro-collagen and become collagen in the following eight weeks after the trauma. During the phase of maturation, water is lost, causing the constriction and tension of tendon or ligament with a consequent reinforcement of the structure itself. If the loss of the contractile force is not recovered, a chronic pain appears.

In a situation of connective insufficiency, every single trauma is unable to provoke a proliferated stimulus so that even a little insult is able to cumulate damage in the point of chronic pain. So, if there is not a adequate proliferated reaction, we have a tendon-ligament insufficiency responsible of the articular chronic pain.

How does prolotherapy work?

The therapy consists of the infiltration of proliferative agents directly in the ill ligament where it meets the bone with the goal to activate or re-activate a reparative sequence that never ended or worst never starter. Doing some infiltrations, the doctor can see the appearance of an immediate and localized inflammation that decreases in the following days. It is important that in this first phase of localized reaction, the patient do not take any anti-inflammatory medicines, which would reduce or neutralize the action of the prolotherapy.

After few weeks or months, the pain vanishes and the doctor can see a real strengthen of the structure with a consequence improving of the articular function.

This therapy is commonly done injecting in the structures some dextrose in high concentration or other substances that stimulate a reaction in the structure itself that, after an inflammatory phase, tends to get stronger.

Patient with clinical relaxation generally do not show any pain, either spinal or charged on the peripheral articulation, associated to creakings and rigidity with reduction of mobility. This would cause different pain situations that present the characteristic to get worst when resting and improving when moving. It is a ligament pain called "theatre syndrome" because of its characteristic to oblige people, who suffer from it, to stand up frequently to alleviate the pain.

This type of patient often needs massages or osteopathic manipulations which give him momentary benefits which oblige him to more and more often get these treatments since they do have a short effect.

PROLIFERANT SUBSTANCES USED IN PROLOTHERAPY

The first class of proliferative is characterized by solutions defined irritant or apteral. Some of them are phenol, guaiacol and the tannic acid.

These substances stimulate the inflammation and activate the process of recovery trough the recall of granulocytes in the injection spot.

The second class of proliferative are the osmotic agents that act removing water from the cells. More concentrated solutions determine a passage of solvent trough permeable membranes of less concentrated solutions.

In this case the less concentrated solution is in the living cells and the cells' membranes characterize the permeable membrane.

Some of the used osmotic substances are the concentrated dextrose, glycerin or the sulphate zinc. These substances injected in the ligaments start a localized inflammatory reaction from a recall of granulocytes and macrophages attracted in the injection spot to who will follow fibroblasts with collagen. The proliferative solutions vary in their mechanism with who cause the localized inflammation but in general all of them act causing a trauma of tissue or an inflammation of cells.

The swollen ligaments after the inflammation due to prolotherapy is stronger, more stretch for the contraction, which is due to the deposit of collagen.

Why, we can ask, the proliferative treatment is necessary if the inflammation (after the initial trauma) is naturally followed by a tissue repair?

Maybe because the repair that followed the trauma is incomplete or the modern medical treatment interferes with the process of recovery.

Open studies with results in whiplash, cephalaea, chronic cervix pain, chronic lumbar pain, pain due to overloaded temporal-mandibular articulation demonstrated an improvement between 70% and 80% trough the use of dextrose or other proliferative substances.

Indications of prolotherapy

Neck and superior extremities benefit of proliferative therapy, in fact many pathologies can start from these anatomic parts: cephalaea, dizziness, dysphasia, brachial pain, scapula-humeral peri-arthritis, epicondylgic, hands pain.

A particular mention has to be done for which plash, post-traumatic pathology which present big therapeutic problems both for the doctor and the therapist. As you all know, the which plash is determined by violent solicitations of the rachis on the sagittal plan with a consequent traction-distension of the capsule-ligament structure.

Since ligaments are scarcely extensible, a relaxation with a progressive articular instability follows and then an algid auto-maintained solution grown in determined movements due to the stimulations of mechanoreceptors and algoreceptors.

Prolotherapy thanks to its localized pro-inflammation promotes a deposit of collagen in the ligament structures that, finding their normal tension, give stability to their articulation and cancel the nociceptor afferents.

Prolotherapy is also useful for chronic dorsal pains.

Results are good for chronic lumbar pain, in the pseudo-sciatica that start from ligaments of the pelvis, in the traumatic or degenerative pathologies of hip, knee and foot.

Prolotherapy is useful for the tibial-tarsal distortion that benefits positively of the treatment because after the traumatic event, usually on the external collateral ligament, an algic situation is determined which tends to auto-maintain for the chronic suffering of the capsule-ligament structures that was previously formed. The physiatrist has to face these forms of relaxation of the ligaments following these obliged phases: the proliferative phase and the proprioceptive phase.

- The proliferative phase is followed for distortions with the aim to recreate a capsule-ligament tension, essential to obtain a passive stability of the articulation
- The proprioceptive phase that follows the first one, has the aim to recreate an equilibrate function of postural anti-gravitational muscles, that ensure the active articular stability; it is also very useful the postural re-programming since there is often a postural imbalance at the beginning of these problems.

Dott.Luciano Bassani - Physiatrist
lcbass@tin.it