

ORTHOSPORTS

QUESTION FOR PHYSIOTHERAPISTS



QUESTION | I HAVE HAD SEVERAL PATIENTS LATELY RECOMMENDED PROLOTHERAPY OR AUTOLOGOUS BLOOD INJECTIONS. WHEN AND WHO SHOULD BE REFERRED TO THESE TREATMENTS, WHAT DO THEY INVOLVE, AND WHAT IS THE EXPECTED RECOVERY FOLLOWING THEM?

ANSWER |

The treatments that have been mentioned in this question are generally recommended in the management of chronic tendinopathy. The general consensus in sports medicine is that the pathology of tendon conditions is one of degenerative and not acute inflammation – hence the change in terminology from ‘tendonitis’ to ‘tendinosis’. Tendinosis is characterised by areas of collagen degradation, increase ground substance and new blood vessel formation.

In light of this, more recent advances in the treatment of tendinopathy have focused on methods of improving tendon healing. The recent mainstay in the physical treatment of tendinosis has been the use of eccentric training programs. The best clinical studies have focused on Achilles tendinopathy (1). The mechanism of action is not necessarily well defined, and may relate to stimulation of fibroblasts for collagen formation, or possibly disruption of neovascularisation. Other areas of tendinosis that have been shown to improve with eccentric exercise include the patella tendon and the common extensor tendon at the elbow.

Aside from exercise therapy it has been postulated that injections of some type of blood product – either autologous whole blood, or PRPP (platelet rich plasma protein) – or prolotherapy, may be helpful in stimulating tendon regeneration. The theoretical use of blood product injections relates to specific platelet derived growth factors (PDGF’s) that are carried in blood, and specifically in platelets. Areas of tendinopathy are generally characterised by poor blood supply which is a factor that may contribute to their slow healing. It has been suggested that injecting fresh blood around tendons may introduce growth factors to the area, which may stimulate a healing response. The first clinical paper supporting autologous blood injections was written by Edwards on the effects of autologous blood on tennis elbow (2). 26 of 28 patients in this study improved after a series of up to 3 injections. This study has been repeated (3) and also shown to be beneficial in medial epicondylitis and patella tendinosis (4,5).

With this in mind, the next logical step in treatment was to try and spin the blood in a centrifuge, which separates the blood into its individual components – red cells, white cells and platelets. The platelet rich portion could then be separated, which in theory would contain more PDGF's, and should provide more benefit in tendon healing. This has produced the PRPP injection. Whilst the theory seems reasonable, at this stage there is still limited literature showing it has any benefit over and above standard treatment or autologous blood injection in the treatment of tendinopathy (6,7,8).

The use of prolotherapy to treat tendinopathy has also been around for many years, dating back to the 1930's. The theory behind this procedure is that injecting a substance that acts as a soft tissue irritant or sclerosant may also initiate a healing response in the tendon. This has generally been an injection of hyperosmolar dextrose. The most recent application of prolotherapy has been suggested by Alfredson, using an agent by the name of polidocanol, in the treatment of chronic Achilles tendinopathy. The suggested theory is that the pain in tendinopathy is caused by the neovascularisation seen histologically and also on colour Doppler (which looks at blood flow). The polidocanol causes sclerosis of this neovascularisation, thus reducing pain. In his pilot study eight out of 10 patients treated with ultrasound guided injections of polidocanol into the area of tendinopathy were happy with the outcome from this treatment (9).

In answer to the original question then, what is the most appropriate management for tendinopathy and when are these various modalities indicated? The first point to make is that tendinopathy is usually self-limiting and as such the prognosis should be considered to be favourable, although may take up to 12-18 months to occur. A small sub-set of patients, however, fail to improve. The mainstay in treatment of tendinopathy is now widely agreed to involve some type of exercise based rehabilitation program, generally involving an eccentric component. There are a number of studies showing the benefits of exercise based therapy over rest (including those for Achilles, patella and common extensor tendons)

The next consideration is whether some type of injectable substance may influence the course of the tendinopathy. It must be remembered that in the preceding text that corticosteroids have not been mentioned. There is no doubt that cortisone injections may be beneficial to pain in chronic tendinopathy. Despite the histology being chronic and not acute inflammation, repeated studies have shown improvements in pain and function in the first 6 weeks after a cortisone injection. This substance has been widely used now for over 60 years and regularly shown to provide benefit. As such it is the more 'tried and true' treatment option which has been more critically studied than any other substance being suggested and seems to give more reliable improvement.

A reasonable approach to injection therapy is to consider a cortisone injection initially to help alleviate symptoms. A cortisone injection may be helpful when there is more acute pain, especially if it is interfering with daily activities or rehabilitation. Once the pain is reduced this may facilitate a strength based rehabilitation program, leading to an overall improvement in function. There may be a role for repeated injections to keep the pain at a manageable level to allow rehabilitation to proceed.

If cortisone injections are unhelpful, or only helpful in the short term, and symptoms dictate that further treatment is required, then one of the other therapies may be indicated. The literature, limited as it is, would suggest that any of the 3 other methods mentioned would be equally effective (10).

From a practical point of view an autologous blood injection is the easiest injection to perform. It involves only taking a small quantity of venous blood and re-injecting that around the affected tendon (generally with a small accompanying amount of local anaesthetic). It can be performed on the day of consultation and does not necessarily need imaging guidance. The PRPP injection requires some more effort. Around 30 mls of venous blood is required and this is placed in a centrifuge and 'spun down' for around 15 minutes. As such it requires a centrifuge, more time, better venous access and generally more expense. As mentioned previously there is no clear indication that the results are any more effective than an autologous blood injection. Prolotherapy, especially if targeting neovascularisation, requires ultrasound guidance with colour Doppler, by either a trained sports physician or radiologist with experience performing this type of injection.

The main side effect from any of these injections is local pain at the site of the injection. The severity and duration of this varies from person to person, but may cause pain anywhere up to 1-2 weeks. This is best treated with local ice and simple analgesics. Maintenance exercises may be performed as soon as the local pain is settling down, and should be encouraged. The recovery time for these injections may be anywhere between 1-6 weeks

The injections may need to be repeated up to 3 times, generally at 6 week intervals, depending on the level of improvement. If there is no improvement then a different strategy may be warranted.

In summary a reasonable paradigm for the treatment of tendinopathy may include:

- Initial physiotherapy with an exercise component (generally an eccentric program)
- If pain persists or is interfering with rehabilitation exercises or daily activities then consider 2-3 corticosteroid injections at 4-6 weekly intervals with continuation of rehab exercises
- If pain is recurring or there is limited improvement with this approach then consider second line treatment with either autologous blood, PRPP or possibly prolotherapy.
- Autologous blood may be suggested first as it is a cheaper alternative to the patient and more readily administered. The limited literature would suggest similar levels of efficacy for all of these treatments in lateral epicondylitis, and certainly nothing to suggest that PRPP injections have advantages over and above autologous blood injections.
- If autologous blood unhelpful (up to 3 injections), then consider a trial of PRPP or prolotherapy
- Surgery as a last option if persistent pain greater than 12 months and interfering with work/daily activities and all other treatment options exhausted.

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