The occasional prolotherapy for lateral epicondylosis (tennis elbow)

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Lateral epicondylosis (formerly epicondylitis), a common overuse condition causing musculoskeletal pain, can be resistant to treatment. Whereas the precise cause of pain is unclear, the etiology of the condition is degenerative in nature, rather than inflammatory. The primary clinical concerns are pain and weakness at the common extensor origin (especially that of the extensor carpi radialis brevis tendon, 1–2 cm distal to its attachment on the lateral epicondyle). Surrounding soft tissue may also be involved.

Tendinopathies and enthesopathies are understood to be primarily degenerative conditions. Thus, current research has focused on addressing this presumed pathophysiology with injectants that may contribute to collagen healing and thereby decrease pain.

Prolotherapy is an injection therapy whose primary intent is to repair damaged connective tissue (i.e., ligament, tendon or cartilage). "Proli" is Latin for "to grow."

The term "prolotherapy" was popularized when early practitioners appreciated tissue hypertrophy after prolotherapy injections using solutions that are currently no longer in use. Although the mechanism of action is not clearly known, it has been reported to be a combination of (brief) local inflammatory effects, induction of local growth factor release and downregulation of neuropathic inflammation.

Injectants such as hyperosmolar dextrose and platelet-rich plasma are both used as regenerative solutions, which may act primarily on collagen fibres, in comparison to other standard of care treatments such as corticosteroid injections and nonsteroidal anti-inflammatory drugs. Once the mainstay for refractory tennis elbow, corticosteroid injections now appear not to be an effective option because they are linked to poorer long-term outcomes.[1]

Prolotherapy and injection of platelet-rich plasma have become more popular over the last few years. Evidence for their use in lateral epicondylosis is accumulating,[2–5] as well as for other chronic musculoskeletal conditions.[6,7] A good peer-reviewed clinical article is available on the subject.[8] The judicial use of prolotherapy by a trained operator may be appropriate for selected patients refractory to more conservative treatments. The following describes a method used in my clinic.

CASE DESCRIPTION

Ms M.C. is a right-handed 32-year-old health care aid, whose job duties include assisting a quadriplegic patient with transferring, dressing and general grooming. She also applies compressive stockings on a daily basis, "which are very difficult to get on." She presents with pain in the right lateral epicondyle region, and has had only partial benefit from physiotherapy and shock wave therapy. She has also tried a corticosteroid injection, with pain relief lasting for only about a week.

PATIENT SELECTION AND PREPARATION

All patients should be counseled, as for any procedure, about the potential benefits and adverse reactions. Common (> 25%) adverse reactions include discomfort or mild pain at the injection site, bruising and mild swelling, and

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itching at the injection site for 1–2 days. Uncommon (< 0.1%) reactions include allergic reaction to the solution, infection, and nerve or vascular injury.[8]

Patients should be advised to stop taking nonsteroidal anti-inflammatory drugs and corticosteroids for at least a week before injection, and for at least 3 weeks after treatment, because these drugs interfere with the inflammatory cascade that is necessary for optimal healing. Simple analgesics such as acetaminophen and weak opioids such as tramadol are fine.

Patients who smoke should be counseled to quit, because tobacco use decreases healing of collagen. Patients with an allergy to lidocaine, which is rare, should be counseled about potential alternate treatments.

METHOD

A knowledge of the anatomy of the surface and deeper structures of the elbow is required (Figs. 1 and 2).

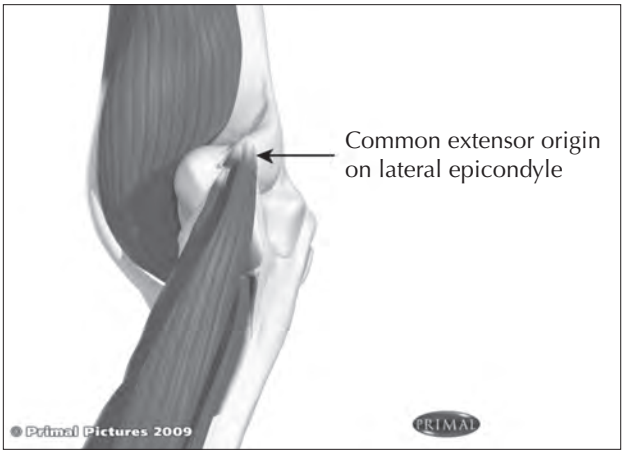


Fig. 1. Left elbow showing muscle origins and entheses. Reproduced with permission from Primal Pictures Ltd. (www.primalpictures.com).

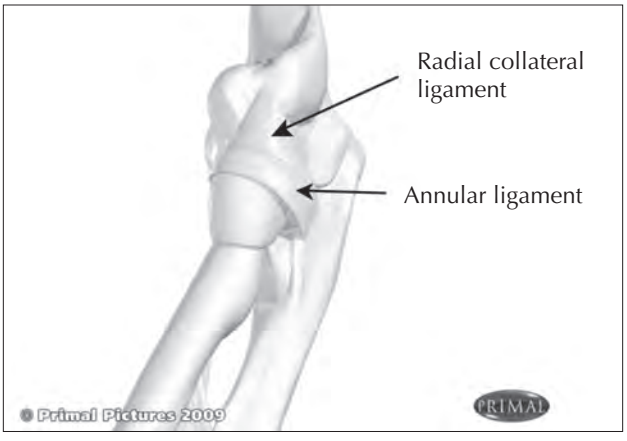


Fig. 2. Left elbow showing deeper ligaments. Reproduced with permission from Primal Pictures Ltd. (www.primal pictures.com).

1. Gather the materials you will need (Fig. 3). Injectate: 12.5% dextrose in 0.75% lidocaine (prepare by adding 1.25 mL of 50% dextrose to 3.75 mL of 1% lidocaine to a total volume of 5 mL). Prepare a sterile dressing tray.
2. Clean the skin with chlorhexidine and alcohol, and take aseptic precautions.
3. Analgesic skin wheals are not routinely used, but a topical anesthetic spray may be used.
4. Using a 27-gauge 1/2-inch needle, inject the origin (the enthesis) of the extensor carpi radialis brevis, as well as tender areas involving the annular ligament (the ligament spanning across the radial head) with 0.3–0.5 mL per tender site (Figs. 4–6).
5. Use a barbotage approach with multiple small injections, and do the injections on periosteal contact (i.e., gently "on bone") because this area is rich in afferent nerves that maintain a neuropathic pain state.

Prolotherapy can be guided by ultrasound (a high-frequency linear probe such as the SonoSite 13-6 MHz transducer with a SonoSite M-Turbo machine is practical), but ultrasound guidance is not necessary for the elbow, and this procedure can easily be done in the office.[3]



Fig. 3. Simple tray setup.

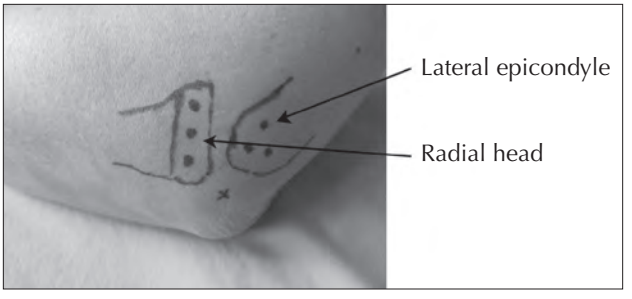


Fig. 4. Potential injection sites (lateral epicondyle and annular ligament) on the left elbow. "X" shows the entry site for intra-articular injection (rarely needed).

Injections are done monthly. Substantial relief is usually obtained after the second or third treatment.

It is very important for patients to do eccentric loading exercises involving the common extensor tendons of the forearm (loading the tendons while they lengthen with a dumbbell or elastic tubing). This can be started 2 days after treatment, or as soon as the treated area allows it, under the guidance of a physiotherapist. Our clinic uses a very slow ramp up and encourages relative rest from pain-producing activities.

CONCLUSION

Prolotherapy requires some training, and various good courses address this (see www.hacketthemwall.org and www.aaomed.org).



Fig. 5. Injection into the annular ligament. The injector's finger is pushing the musculature, and radial nerve more medially, so as not to cause a (temporary) wrist drop.



Fig. 6. Injection into the lateral epicondyle. Injection trajectory is at 90 degrees to the structure being injected.

Prolotherapy is a safe, economical and effective intervention for pain associated with lateral epicondylosis. Rural physicians should consider it as a treatment option for lateral epicondylosis, especially when more conservative approaches have not been successful.

Competing interests: None declared.

REFERENCES

1. Coombes BK, Bisset L, Brooks P, et al. Effect of corticosteroid injection, physiotherapy, or both on clinical outcomes in patients with unilateral lateral epicondylalgia: a randomized controlled trial. *JAMA* 2013;309:461-9.
2. Mishra AK, Skrepnik NV, Edwards SG, et al. Platelet-rich plasma significantly improves clinical outcomes in patients with chronic tennis elbow: a double-blind, prospective, multicenter, controlled trial of 230 patients. *Am J Sports Med* 2013 July 3. [Epub ahead of print].
3. Scarpone M, Rabago DP, Zgierska A, et al. The efficacy of prolotherapy for lateral epicondylosis: a pilot study. *Clin J Sport Med* 2008;18:248-54.
4. Rabago, D, Lee KS, Ryan M, et al. Hypertonic dextrose and morrhuate sodium injections (prolotherapy) for lateral epicondylosis (tennis elbow): results of a single-blind, pilot-level, randomized controlled trial. *Am J Phys Med Rehabil* 2013;92:587-96.
5. Carayannopoulos A, Borg-Stein J, Sokolof J, et al Prolotherapy versus corticosteroid injections for the treatment of lateral epicondylosis: a randomized controlled trial. *PM R* 2011;3:706-15.
6. Distel LM, Best TM. Prolotherapy: a clinical review of its role in treating chronic musculoskeletal pain. *PM R* 2011;3(Suppl 1):S78-81.
7. Topol GA, Podesta LA, Reeves KD, et al. Hyperosmolar dextrose injection for recalcitrant Osgood-Schlatter disease. *Pediatrics* 2011; 128:e1121-8.
8. Rabago D, Slattengren A, Zgierska A. Prolotherapy in primary care practice. *Prim Care* 2010;37:65-80.

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