

Autologous blood injection for tendinopathy

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NICE interventional procedure guidance 438

guidance.nice.org.uk/ipg438

NHS Evidence has accredited the process used by the NICE Interventional Procedures Programme to produce interventional procedures guidance. Accreditation is valid for 5 years from January 2010 and applies to guidance produced since January 2009 using the processes described in the 'Interventional Procedures Programme: Process guide, January 2009' and the 'Interventional Procedures Programme: Methods guide, June 2007'



1 Guidance

This document replaces previous guidance on autologous blood injection for tendinopathy (interventional procedure guidance 279).

- 1.1 The evidence on autologous blood injection for tendinopathy raises no major safety concerns. The evidence on efficacy remains inadequate, with few studies available that use appropriate comparators. Therefore, this procedure should only be used with special arrangements for clinical governance, consent and audit or research.
- 1.2 Clinicians wishing to undertake autologous blood injection for tendinopathy should take the following actions.
- Inform the clinical governance leads in their Trusts.
 - Ensure that patients understand the uncertainty about the procedure's efficacy (especially in the long term), make them aware of alternative treatments and provide them with clear written information. In addition, use of NICE's [information for the public](#) is recommended.
 - Audit and review clinical outcomes of all patients having autologous blood injection for tendinopathy (see [section 3.1](#)).
- 1.3 NICE encourages further research comparing autologous blood injections (with or without techniques to produce platelet-rich plasma) against established non-surgical methods for managing tendinopathy. Trials should clearly describe patient selection (including the site of tendinopathy, duration of symptoms and any prior treatments) and document whether a 'dry needling' technique is used. Outcomes should include specific measures of pain, quality of life and function, and whether subsequent surgical intervention is needed.

2 The procedure

2.1 Indications and current treatments

- 2.1.1 'Tendinopathy' describes a range of conditions that affect tendons, causing pain, weakness and stiffness. The symptoms are usually associated with overuse. Sites commonly involved are the extensor (elbow), Achilles (heel) and patellar (knee) tendons. Tendinopathy also has other names – for example, tendonosis and tendonitis – and it encapsulates a range of pathologies, including inflammatory, non-inflammatory and degenerative changes.
- 2.1.2 Tendinopathy usually resolves over a period of several months. Conservative treatments include rest, analgesics, anti-inflammatory medication, use of orthotic devices, eccentric exercise and physiotherapy. Local injection of steroids, extracorporeal shockwave therapy, or sometimes surgery to release the tendon from the underlying bone or constricting surrounding tissues, can also be used. A period of rehabilitation is usually needed after any surgical intervention.

2.2 Outline of the procedure

- 2.2.1 Autologous blood injection (using whole blood or platelet-rich plasma) is claimed to promote healing through the action of growth factors on the affected tendon.
- 2.2.2 A variable amount of blood is withdrawn from the patient by standard venesection. Sometimes the blood is centrifuged to produce a platelet-rich sample. About 2–3 ml of whole blood or platelet-rich plasma is injected into and around the damaged tendon, sometimes with ultrasound guidance. Local anaesthetic is usually used. 'Dry needling' (repeatedly passing a needle through the tendon to disrupt the fibres and induce bleeding) may be performed before injection of the blood. A 'peppering' technique is sometimes used to inject the autologous blood; this involves inserting the needle into the tendon, injecting some of the blood, withdrawing without emerging from the skin, slightly redirecting and reinserting. After the procedure, patients are usually advised to avoid strenuous or excessive use of the tendon for a few

weeks, after which physiotherapy is started. The procedure may be repeated if needed.

Sections 2.3 and 2.4 describe efficacy and safety outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [overview](#).

2.3 Efficacy

- 2.3.1 In a randomised controlled trial (RCT) of 150 patients with tennis elbow, 70 were treated by autologous blood injection and 80 were treated by platelet-rich plasma injection. Technical success was defined as an improvement in patient-rated tennis elbow evaluation score of 25 points at final analysis; measured on a scale of 0–100, with a higher score indicating more pain and functional disability. Of those patients followed up at 6 months, technical success was reported in 72% (43/60) of patients treated by autologous blood injection and 66% (46/70) treated by platelet-rich plasma injection ($p=0.59$).
- 2.3.2 In an RCT of 100 patients with tennis elbow, 51 were treated by platelet-rich plasma injection and 49 were treated by corticosteroid injection. Successful treatment was defined as a reduction of 25% on the visual analogue scale pain score (measured on a scale of 0–100, with a higher score indicating more pain) and no reintervention after 2 years. At 2-year follow-up, successful treatment was achieved in 76% (39/51) of patients treated by platelet-rich plasma injection and 43% (21/49) treated by corticosteroid injection ($p<0.0001$).
- 2.3.3 In an RCT of 54 patients with Achilles tendinopathy, 27 were treated by platelet-rich plasma injection and 27 were treated by placebo injection. The mean difference on the Victorian Institute of Sports assessment – Achilles (VISA-A) scale (assessing the severity of Achilles tendinopathy on a scale of 0–100, with a lower score indicating higher severity) was not significant (6 points [95% confidence interval (CI) –5 to 16]) at 1-year follow-up (p value not reported).

- 2.3.4 In the RCT of 100 patients with tennis elbow, 12% (6/51) of patients treated by platelet-rich plasma injection and 29% (14/49) of patients treated by corticosteroid injection needed further intervention within 2–14 months. Of those treated by platelet-rich plasma injection, 6% (3/51) had subsequent corticosteroid injections. Of those treated by corticosteroid injection, 16% (8/49) had subsequent corticosteroid or platelet-rich plasma injections.
- 2.3.5 In the RCT of 54 patients with Achilles tendinopathy, 57% of the platelet-rich plasma group and 42% of the placebo group returned to their previous level of sporting activity (absolute figures not reported). The adjusted between-group difference for return to sports was 2% (95% CI –25 to 28) at 1-year follow-up. This difference was not significant ($p=0.89$).
- 2.3.6 The Specialist Advisers listed key efficacy outcomes as pain relief and improved function.

2.4 Safety

- 2.4.1 In a case series of 28 patients with tennis elbow, 7% (2/28) of patients needed narcotic analgesia because of pain after autologous blood injection. Most patients in this series reported that the pain was similar to the pain they had experienced after previous steroid injections into the tendon.
- 2.4.2 Moderate pain and stiffness after the injections, which persisted for a few days, was reported in all patients in a case series of 20 patients with patellar tendinosis. One patient had more severe pain after the injection which took 3 weeks to resolve (no further information reported).
- 2.4.3 The Specialist Advisers listed anecdotal adverse events to be increased pain, flare of pain, reduced functioning, and damage to surrounding tissues. Theoretical adverse events were considered to be tendon rupture, damage to the tendon and infection.

2.5 Other comments

- 2.5.1 The Committee noted that autologous blood injection for tendinopathy can be performed using either autologous whole blood or platelet-rich plasma. The latter aims to deliver a greater concentration of growth factors. Studies comparing the use of whole blood and platelet-rich plasma did not demonstrate any substantial differences in efficacy. Therefore, the Committee considered it reasonable to evaluate the evidence on injection with either whole blood or platelet-rich plasma as equivalent treatments in this guidance.
- 2.5.2 A number of RCTs have been published since this procedure was evaluated in 2009 (NICE interventional procedure guidance 279). However, the Committee considered that the comparators used in most of the studies were not useful in determining whether autologous blood injection for tendinopathy is efficacious.
- 2.5.3 The Committee was advised that Achilles tendinopathy may respond differently to treatment compared with tendinopathy at other sites, so it may not be valid to extrapolate the findings of studies using this procedure to different sites.
- 2.5.4 The Committee noted that some of the published studies involved the use of a 'dry needling' or 'peppering' technique before the injection of autologous blood, but it was not possible to differentiate between the effects of these variations to the procedure.

3 Further information

- 3.1 This guidance requires that clinicians undertaking the procedure make special arrangements for audit. NICE has identified relevant audit criteria and has developed an audit tool (which is for use at local discretion).
- 3.2 For related NICE guidance see our [website](#).

Information for patients

NICE has produced information on this procedure for patients and carers ([Information for the public](#)). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

About this guidance

NICE interventional procedure guidance makes recommendations on the safety and efficacy of the procedure. It does not cover whether or not the NHS should fund a procedure. Funding decisions are taken by local NHS bodies after considering the clinical effectiveness of the procedure and whether it represents value for money for the NHS. It is for healthcare professionals and people using the NHS in England, Wales, Scotland and Northern Ireland, and is endorsed by Healthcare Improvement Scotland for implementation by NHSScotland.

This guidance was developed using the NICE [interventional procedures guidance process](#).

It replaces NICE interventional procedure guidance 279.

We have produced a [summary of this guidance for patients and carers](#). Tools to help you put the guidance into practice and information about the evidence it is based on are also [available](#).

Your responsibility

This guidance represents the views of NICE and was arrived at after careful consideration of the available evidence. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. This guidance does not, however, override the individual responsibility of healthcare professionals to make appropriate decisions in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

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