



# Autologous blood injections for resistant tendinopathy

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The majority of overuse tendon injuries show degenerative rather than inflammatory changes. Conservative treatments include rest from aggravating activities, physiotherapy (including eccentric exercise regimes), analgesics, NSAIDs, glyceryl trinitrate patches and cortisone injections. Many cases of tendinopathy remain resistant to treatment and autologous blood injection (ABI) has shown promising results. Improvement in pain and function in 70-90% of patients has been reported with this new treatment modality.

Members of the Australian men and women's hockey teams, local AFL teams and Olympic track and field athletes have been treated with ABI for hamstring, patella and adductor tendinosis. Although cortisone injection may provide more rapid pain relief (within the first few weeks post injection), the outcome over weeks to months seems superior with ABI. For chronic tendon injuries (>3 months' duration), the primary role of ABI is to strengthen the tendon through fibroplasia. There are no good research studies comparing cortisone to ABI.

## Pathophysiology

Overuse tendon injury (tendinopathy) is due to tendon overload and results in pain, reduction in function, and reduced exercise tolerance. The hallmark degenerative changes include microtearing with disruption of collagen bundles, vascular and fibroblast proliferation and focal hyaline degeneration. Repetitive microtrauma results in a chronic cycle of tendon degeneration and repair with progressive tendon weakening.

## How does ABI work?

Decreased blood supply to the tendon is believed to play a role in the development of tendon degeneration. Conversely, it appears that potent chemical factors in blood can stimulate both vascular regrowth and fibroblast activity – ABI provides cellular and humeral mediators that interrupt the degenerative cycle and hasten return of the normal healing process.

For example, platelets are rich in growth factors, particularly *transforming growth factor-b* and *basic fibroblast growth factor*, which induce a healing cascade in chronic tendon injuries.

Tenotomy (or fenestration; repeated dry needling of an area of tendinosis) promotes local bleeding through mechanical disruption of a tendon, thus initiating a healing response. This technique is used in conjunction with ABI.

## Tendinopathies that can be treated with ABI:

- Lateral and medial epicondylitis
- Hamstring tendinosis
- Achilles tendinosis

- Patellar tendinosis (jumper's knee)
- Adductor tendinosis
- Plantar fasciitis
- Rotator cuff tendinosis

## ABI technique.

Ultrasound most accurately identifies the tendon pathology prior to injection (and is used to monitor tendon healing). An initial tenotomy is performed followed by injection of blood (about 3ml from an antecubital vein) back into the degenerate portion of tendon.

**Precautions.** Pain is usual for 24-48 hrs afterwards (sometimes more than with cortisone injection). There is occasional bruising. Blood disorders or anticoagulant treatment are potential contra-indications.

**Instructions post-ABI.** There is no formal exercise for 7 days after injection (although normal daily activity is continued). Graduated incremental activities over 2-3 weeks (preferably specific rehabilitation exercises) should see a gradual symptomatic improvement over 2-8weeks. A second injection may be needed between 1 to 3 months later, and occasionally a third (depending on clinical assessment). ■

## ABI outcomes – various studies

Lateral epicondylitis: 60% pain reduction at 4/52; 80% at 6/12; 90% by 2 years.

Medial epicondylitis: 50-60% pain reduction at 4/52; 90% at 10/12.

Patellar tendonitis: 60% better pain/function at 6/52.

Plantar fasciitis: Significant less pain from 6/52, improving further at 3-6/12. Steroid injection similar response.