

**NIHR Innovation Observatory  
Evidence Briefing: May 2017****Tendoncel for the treatment of tennis elbow**

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**LAY SUMMARY**

Tennis elbow is an irritation or damage of the tendon (flexible cord which attaches muscles to bones) in the elbow which causes pain and tenderness. It is usually caused by overuse of the muscles in the arm, particularly by doing activities which involve straining or twisting the wrist (e.g. typing). In 80% of cases, tennis elbow will settle down by itself within a year and will require little treatment except avoiding activities which may cause pain, using over the counter painkillers and physiotherapy. However in some people, symptoms may last longer and be more severe. For these people, steroid injections into the elbow and surgery might be used to treat the tennis elbow.

Tendoncel is a gel which can be applied directly onto the skin of the elbow. Tendoncel gel contains a mixture of growth factors (a small substance which encourages cells to grow) which help the tendon to repair and heal. A clinical trial of tendoncel in people with severe tennis elbow showed improvements in elbow pain.

If tendoncel was licensed in the UK, it would provide a less invasive treatment option to people with severe or prolonged tennis elbow which may delay the need for surgery and improve symptoms.

*This briefing is based on information available at the time of research and a limited literature search. It is not intended to be a definitive statement on the safety, efficacy or effectiveness of the health technology covered and should not be used for commercial purposes or commissioning without additional information.*

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## TARGET GROUP

Tendon injury: chronic grade 3 and 4 lateral epicondylitis (tennis elbow); severe; second line after rest

## TECHNOLOGY

### DESCRIPTION

Tendoncel is a novel patented regenerative allogenic topical gel. It incorporates platelet growth factors (including PDGF-BB, VEGF, PDGF-AA, thrombospondin and angiopoietin) in a cellulose derived gel which controls the growth factor release to optimise bioavailability and dose. These growth factors have been seen to facilitate the healing of cutaneous and soft tissue injuries with variable efficacy. In the phase II clinical trial, tendoncel gel is administered once daily for 21 days.<sup>1</sup>

## INNOVATION and/or ADVANTAGES

If licensed, tendoncel will offer a novel alternative treatment option for patients with severe (grade 3 and 4) tennis elbow who currently have few effective therapies available. Tendoncel has the potential to improve symptoms in patients with severe tennis elbow and delay the need for invasive treatments or surgical intervention.<sup>2</sup>

## DEVELOPER

Celixir; Cell Therapy

## AVAILABILITY, LAUNCH or MARKETING

Tendoncel does not currently have Marketing Authorisation in the EU for any indication. A phase II trial was completed for use in tennis elbow.<sup>1</sup>

## PATIENT GROUP

### BACKGROUND

Tennis elbow (or lateral epicondylitis) is a type of tendinopathy which occurs when the common extensor tendon (tendon which attaches the forearm muscles to the outer elbow) becomes inflamed or damaged causing pain and tenderness. It most commonly occurs between the ages of 40 and 50 years and usually develops in the dominant arm. Tennis elbow is most commonly caused by the overuse of the muscles in the arm, particularly repetitive activities which involve straining or twisting the wrist, therefore e.g. plumbers, bricklayers, painters, gardeners and those who spend large amounts of time at computers are most likely to suffer from it.<sup>3</sup> The subsequent strain on the tendons and muscles from this overuse can cause tiny tears and inflammation near the lateral epicondyle on the outer elbow. Symptoms can develop gradually over time or a few days after a particularly strenuous activity. The most common symptom is pain in the outer elbow and forearm muscles. This pain may be exacerbated by lifting/bending the arm, gripping small objects (e.g. a pen) or by twisting the forearm (e.g. when opening a jar). Pain can range from mild pain during use of the elbow to severe pain which is felt when the arm is still.<sup>4,5</sup>

## CLINICAL NEED and BURDEN OF DISEASE

Tennis elbow is a common condition, with approximately 4 to 7 in 1,000 people visiting their GP about tennis elbow in the UK every year.<sup>5,6</sup> One study estimated age adjusted incidence rates of 2.38 per 1,000 person years in males and 2.43 per 1,000 person years in females.<sup>7</sup> Prevalence of tennis elbow in the UK population is estimated at between 1% and 3% of the total population. The direct cost to society in terms of lost productivity and healthcare usage is high, particularly in those with severe disease whose symptoms persist.<sup>6</sup>

In 2015, there were 7,590 admissions for enthesopathies (disorder of the tendon or ligament attaching to a bone) excluding lower limb (ICD10: M77) in England, resulting in 1,184 bed days and 7,590 finished consultant episodes.<sup>8</sup>

## PATIENT PATHWAY

### RELEVANT GUIDANCE

#### NICE GUIDANCE

- NICE interventional procedures guidance. Extracorporeal shockwave therapy for refractory tennis elbow (IPG313). August 2009.

## NHS ENGLAND and POLICY GUIDANCE

- NHS England. 2013/14 NHS Standard Contract for Specialised Orthopaedics. D10/S/a.

## OTHER GUIDANCE

No other guidance was identified.

## CURRENT TREATMENT OPTIONS

As tennis elbow is a self-limiting condition, it will get better without treatment. However tennis elbow and its symptoms usually persist between six months and two years, with 90% of people recovering within a year.<sup>4</sup> Treatments start with modifying activities which cause strain on the tendon up to surgery in the most severe cases. The current treatment options available for tennis elbow are summarised below:<sup>9</sup>

- Avoidance or modification of activities which strain the muscles and tendon of the arm
- Painkillers and NSAIDs (e.g. paracetamol and Ibuprofen) – topical formulations are preferred to avoid side effects of oral painkiller and NSAID use
- Physiotherapy – including manual therapy and exercises to strengthen the forearm
- Orthoses (e.g. braces, strapping, support bandages and splints)
- Corticosteroid injection into the elbow joint
- Shock wave therapy – high energy shock waves are passed through the skin directly over the joint
- Surgery – damaged part of the tendon is removed

## EFFICACY and SAFETY

<b>Trial</b>	<b>Tendoncel; adults with chronic grade 3 (severe) lateral epicondylitis; tendoncel gel vs. placebo gel; phase II trial</b>
<b>Sponsor</b>	Cell Therapy Ltd.
<b>Status</b>	complete and published in abstract
<b>Source of Information</b>	Abstract, <sup>6</sup> poster <sup>1, 2</sup>
<b>Location</b>	Not reported
<b>Design</b>	Randomised , placebo-controlled double-blind trial
<b>Participants</b>	N=34, aged above 18 years, diagnosed with chronic grade 3 lateral epicondylitis confirmed with Cozen's test
<b>Schedule</b>	Randomised to tendoncel topical gel or placebo gel (applied to the lateral epichondyle) once daily for 21 consecutive days.
<b>Follow-up</b>	Active treatment for 21 days, follow-up 3 months
<b>Primary Outcomes</b>	Improvement in tendon injury assessed using DASH (Disabilities of the Arm, Shoulder and Hand) and PRTEE (Patient-rated Tennis Elbow Evaluation) questionnaires.
<b>Secondary Outcomes</b>	Not reported
<b>Key Results</b>	Statistically and clinically significant improvements in outcomes were observed. 70% (p=0.002) improvement in DASH and 74% (p=0.002) improvement in PRTEE questionnaires in the tendoncel group were reported from the start of treatment to the three month follow up. There were no significant differences between treatment and placebo group at baseline in DASH Score (p=0.1) or PRTEE Score (p=0.16).
<b>Adverse effects (AEs)</b>	No serious adverse events or changes in IgE levels (to assess any systemic affects) were reported.
<b>Expected reporting date</b>	-

## ESTIMATED COST and IMPACT

### COST

The cost of tendoncel is not yet known.

### IMPACT – SPECULATIVE

#### IMPACT ON PATIENTS and CARERS

- Reduced mortality/increased length of survival
  Reduced symptoms or disability

- Other: *improved patient convenience, wider societal benefits (e.g. earlier return to normal activities, including employment)*       No impact identified

## IMPACT ON HEALTH and SOCIAL CARE SERVICES

- Increased use of existing services       Decreased use of existing services
- Re-organisation of existing services       Need for new services
- Other       None identified

## IMPACT ON COSTS and OTHER RESOURCE USE

- Increased drug treatment costs       Reduced drug treatment costs
- Other increase in costs       Other reduction in costs: *reduced need for interventional procedures (surgical procedures)*
- Other: *specify, e.g. uncertain unit cost compared to existing treatments*       None identified

## OTHER ISSUES

- Clinical uncertainty or other research question identified       None identified

## REFERENCES

- 1 Cell Therapy. Cell Therapy Ltd announces positive Phase II clinical trial results of Tendoncel™, a first-in-class topical regenerative medicine for severe tendon injury. Cell Therapy 2015.
- 2 Reginald A, Mousiadou A, Evans M, Panagiotis G. Tendoncel phase II placebo controlled randomised clinical trial results of a novel allogenic regenerative topical medicine in treatment of chronic tendon injury *European Society of Gene and Cell Therapy Congress, 17-20 September 2015, (ESGCT 2015)*. Helsinki, Finland: Cell Therapy Ltd 2015.
- 3 Bupa UK. Tennis Elbow. 2015 06-2015 [cited 09-05-2017]; Available from: <https://www.bupa.co.uk/health-information/directory/t/tennis-elbow>
- 4 NHS Choices. Tennis Elbow - Symptoms 2014 27-09-2014 [cited 09-05-2017]; Available from: <http://www.nhs.uk/Conditions/Tennis-elbow/Pages/Symptoms.aspx>
- 5 NHS Choices. Tennis Elbow - Overview. 2014 27-09-2014 [cited 09-05-2017]; Available from: <http://www.nhs.uk/Conditions/Tennis-elbow/Pages/Introduction.aspx>
- 6 BMJ Best Practice. Tennis Elbow. 2011 27-06-2011 [cited 09-05-2017]; Available from: <http://bestpractice.bmj.com/best-practice/evidence/background/1117.html>

- 7 Titchener AT, Fakis A, Smith CP, Clark DI, Hubbard RB. Study of Lateral Epicondylitis (Tennis Elbow) Using the Health Improvement Network Database. *Shoulder & Elbow*. 2012;2012/07/01;4(3):209-13.
- 8 NHS Digital. Hospital Episode Statistics for England. Admitted Patient Care statistics, 2015-16 . Office of National Statistics: Office of National Statistics; 2015.
- 9 NHS Choices. Tennis Elbow - Treatment. 2014 27-09-2014 [cited 08-05-2017]; Available from: <http://www.nhs.uk/Conditions/Tennis-elbow/Pages/Treatment.aspx>