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BESS patient care pathway: Tennis elbow

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Abstract

This article provides a guidance summary for the management of lateral elbow tendinopathy (LET) using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) system of the rating quality of the literature and grading the strength of available evidence. The process began by assembling a guideline development group of volunteers including orthopaedic surgeons, trainees, physiotherapists, rheumatologists, radiologists and patients. Virtual meetings were organised to set out explicit PICO questions, including specification of all important outcomes (including patient reported tennis elbow evaluation (PRTEE) as an important primary outcome) to determine the clinical effectiveness of common treatment options for LET compared with no treatment or placebo. Clinical librarian searched (date 31 April 2022) for available systematic reviews and randomised controlled trials reviewing the management of the LET January 2011 onwards and evidence was collected and summarized using explicit GRADE criteria for rating the quality of evidence that include study design, risk of bias, imprecision, inconsistency, indirectness, and magnitude of effect. Recommendations were characterized as strong or weak (alternative terms conditional or discretionary) according to the quality of the supporting evidence and the balance between desirable and undesirable consequences of alternative management options. This informative summary provides the quality of available evidence for the management of LET.

Keywords

patient care pathway, tennis elbow, GRADE guidelines

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Introduction

Definition

Lateral elbow tendinopathy occurs as a result of altered tissue homeostasis leading to pain in the lateral aspect of the elbow which can radiate down the forearm and affects tasks involving gripping, or fine dexterous skills.[1] It is a common musculoskeletal presentation to both primary and secondary care clinicians. It is diagnosed clinically based on history and examination findings. The incidence is thought to be between 4 and 7/1000.[2]

Shared decision-making

The General Medical Council's Good Medical Practice – Duties of a Doctor guide[3] clearly states in the section on working in partnership with patients that doctors should:

- Listen to patients and respond to their concerns and preferences.
- Give patients the information they want or need in a way they can understand.
- Respect patients' right to make decisions with the doctor about their treatment.
- Support patients in caring for themselves to improve and maintain their health.

This can only be achieved by direct consultation between the patient and their treating clinician, resulting in a shared decision-making.

Background

Lateral elbowtendinopathy (LET) is a common condition that affects about 1−3% of the population (about 4–7 cases per 1000)[4] every year. It is the most common cause of persistent elbow pain, accounting for two-thirds of the cases. It affects

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women and men equally, and those affected are mostly between the ages of 35–54. Although, in many cases, the condition is self-limiting, some individuals suffer from persistent symptoms.[2] A meta-analysis[5] was published outside of the scope of the literature review but has been included because of its relevance and importance. The symptom trajectories of 1085 patients from 24 trials who received no active treatment were included in the meta-analysis. Global improvement, the mean pain and mean disability were pooled using follow-up data of up to 12 months. The symptoms were shown to resolve in an exponential manner unrelated to the duration of symptoms at presentation, with a half-life of global improvement of 2.5–3months. In the first year, 89% of patients experienced global improvement, defined as feeling much better or completely resolved.

Review of existing guidelines

A review of the existing guidance was undertaken to provide context for these new guidelines and to avoid duplication. Medline, Embase, Trip, SIGN, NICE, PEDro and Google were searched for national, international and society publications produced within the last 10 years that provided clinical guidelines for the diagnosis and management of lateral elbow tendinopathy. After excluding the results which were not according to the guidelines or where no translatable access was available, 3 publications were identified. These were published by the American College of Occupational & Environmental Medicine (2013),[6] the Japanese Orthopaedic Association (2014),[7] and a clinical knowledge summary from NICE (2020).[8]

These guidelines assessed systematic reviews, panel grading and consensus opinion for providing their recommendations with different grading systems used in each guideline. Treatment with physiotherapy was the only strong recommendation across these guidelines, with a variety of recommendations for other treatment options. The NICE clinical knowledge summary was aimed at primary care and did not consider secondary care pathways. American and Japanese guidelines are more than five years old and therefore the committee concluded that it was reasonable to consider an up-to-date review of treatment options for lateral elbow tendinopathy using a modern guideline methodology.

Aims of treatment

The overall treatment aim for LET is to relieve pain and improve functioning. Treatment success needs to be defined individually with patients in a shared decision-making process.

Pre-primary care (at home)

For people experiencing pain from LET, there is potential for simple patient self-management strategies like stretching exercises and topical medications at home prior to the need for a general practitioner consultation, although research to develop and assess the impact of such strategies would be needed.

Primary care/community triage services

(https://cks.nice.org.uk/topics/tennis-elbow/management/management/)

- Diagnosis is primarily based on the history and examination (See the figure, which also provides guidance on early treatment and referral).
- Making the correct diagnosis is crucial, and will ensure an efficient and optimum treatment for the patient.
- Plain radiographs of the elbow are not essential for confirming the diagnosis. Specialist imaging such as magnetic resonance imaging (MRI) or computed tomography (CT) scans are not needed for treatment of LET in the primary care setting.
- Patient counselling regarding self-management, the self-limiting nature of the conditions and early access to physiotherapy is recommended.

Features of importance are:

- Insidious onset of pain, location over lateral epicondyle, radiation down the forearm.
- Hand dominance.
- Occupation and level of activity or sports.
- Duration of symptoms.
- No history of trauma or minor trauma.
- Pain provoked by grasping or twisting of the forearm.
- No report of loss of range of movement, neurological symptoms or mechanical symptoms such as locking.
- The patient may state their arm feels weak due to pain inhibition
- Tenderness on palpation over the lateral epicondyle or when the patient extends their wrist or fingers. Certain special tests like Cozens, Mills or Maudsley's test which can be done to add clinical weighting to the diagnosis.

Red flags for the elbow:

Any elbow 'red flags' identified during primary care assessment needs urgent secondary care referral.

- Child or adolescent: refer to trauma & orthopaedics
- History of injury likely to cause harm: fracture or dislocation, refer to fracture clinic
- Swelling/lumps: refer to the orthopaedic clinic
- Inflammation/ multiple joints involved: Refer to rheumatology
- A suspected malignancy or tumour needs urgent referral following the local two-week cancer referral pathway.

Treatment in primary care and community triage services: (Figure 1)

Following interventions are suitable for primary care:

- Analgesics/non-steroidal anti-inflammatory drugs (NSAIDs) (topical/ oral)
- Physical therapy and orthotics if available
- Reassurance: this is a self-limiting condition and most symptoms respond within three months.
- Patient education leaflets suggesting activity modification and modified lifting techniques.
  Exercise sheets including stretching exercises and eccentric loading of extensor tendons. https://bess.ac.uk/tennis-elbow.

- Avoiding steroid injections.
- Beware of red flags such as tumours, infections, fractures, or inflammatory arthritis.
- Failure of improvement within 12–24 weeks should trigger a referral to secondary care.

Secondary care (Figure 1)

- Confirming diagnosis with history and examination.
- Obtaining images with plain radiographs if the diagnosis is not certain to rule out other differentials such as fractures, arthritis or loose bodies. Specialist imaging with ultrasound, CT or MRI scans may be needed if the diagnosis is not certain.
- Ensuring a multidisciplinary approach for care including physiotherapists and surgeons.
- The following nonsurgical interventions maybe considered in secondary care but patients should be made aware that there is no evidence of benefit compared to placebo:
  - PRP injection
  - Orthotics and Splints
  - Dry Needling
- If symptoms fail to resolve with nonsurgical treatment over three to six months, then arthroscopic or open surgical interventions may be considered but patients should be made aware that there is no evidence of the benefit of surgery compared to a placebo.

Linked metrics

- Diagnosis Codes T69.1, T74.4
- Procedure Codes (OPCS 4.7) – W78.5
- HRG codes: HN65Z: minor elbow procedures for non-trauma, HN64A intermediate elbow procedures for non-trauma, HN66Z: minor elbow procedures

Outcome metrics

The core outcome set for LET defined by Bateman et al.[9]

- PRTEE
- PRTEE pain & function subscale
- Pain-free grip strength
- Time off work

Research and audit

General LET research recommendations:

- Researchers should consider research priorities identified by the James Lind Alliance Priority setting partnership.[10] Which for this topic is "What is the best treatment approach (surgery or without surgery) in the management of early or persistent elbow tendinopathies (such as tennis/golfer's elbow)?"
- All future research should include the core outcome set for LET defined by Bateman et al.[9]
- Future studies should compare interventions to a placebo or no intervention arm.
- Future studies need a minimum follow-up of 12 months.

Future research questions for the treatment of patients with LET:

- Research is required to determine whether imaging alters the management or guides prognosis in the treatment of LET.
- Research is needed to compare physiotherapy to no intervention in patients with LET after surgery.
- Research is needed to compare physiotherapy to no intervention in patients with LET with greater than 12 months of duration of symptoms.
- Research is needed to compare surgery to placebo or no intervention in patients with LET who have not responded to a period of non-surgical treatment.
- Research is needed to compare PRP injection to placebo in patients with LET.

Evidence based on PICO questions: lateral Elbow Tendinopathy (Table 1)

Does physiotherapy alone alter the course of LET?

We searched for systematic reviews of randomised trials comparing the effectiveness of physiotherapy interventions (excluding electrotherapies, acupuncture and taping) versus wait-and-see or no intervention. 183 results were screened by title and 22 were screened by full text, leaving two systematic reviews that included relevant meta-analyses targeting the review question. Olaussen et al. in 2013[11] conducted studies using patient information and wait-and-see, placebo saline injection or sham ultrasound therapy as 'no intervention' comparators. Karanasios et al. in 2021[12] conducted studies using patient information and wait-and-see as comparators.

There is strong evidence of benefit and we recommend that patients should be offered physiotherapy treatment for LET. Pooled data demonstrate that physiotherapy

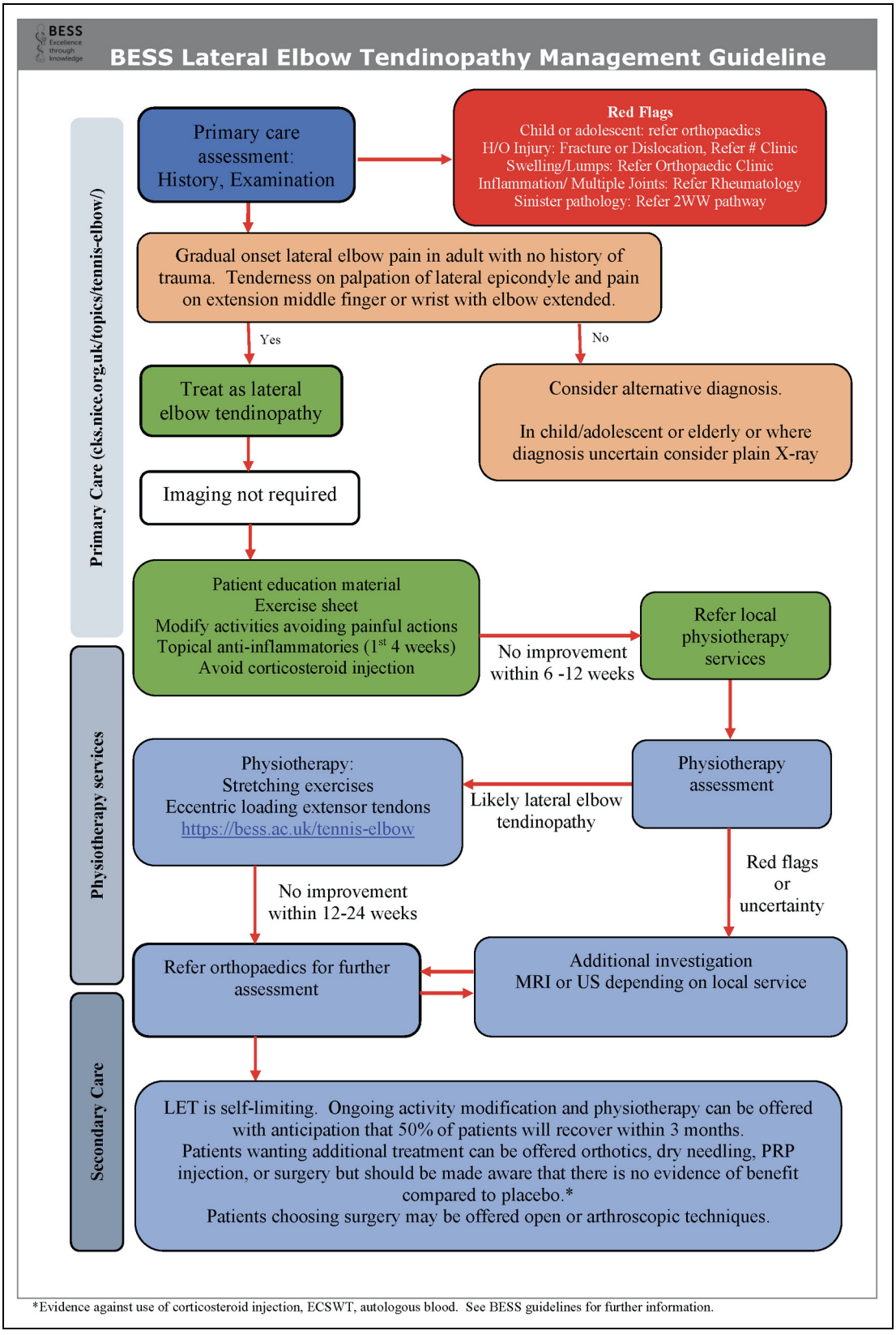

Figure 1. Flow chart lateral elbow tendinopathy.

Table 1. Summary of recommendations.

Patients should be offered physiotherapy for LET.	Strong
Corticosteroid injection should not be used in the treatment of LET	Strong
Extracorporeal shockwave therapy should not be used for treatment of LET.	Strong
Imaging should be considered for patients with symptoms of LET only where there is diagnostic uncertainty.	Conditional neutral
The choice of imaging modality in patients with symptoms of LET but with diagnostic uncertainty will depend on the patient and local organisation factors.	Conditional neutral
Patients who have had symptomatic LET for more than twelve months may be offered physiotherapy to support them during their recovery particularly if they have not been offered physiotherapy before.	Conditional neutral
Patients may be offered physiotherapy after surgery for LET to support them during their recovery.	Conditional neutral
Patients being offered PRP for the treatment of LET should be made aware that it may have no benefit over a placebo.	Conditional neutral
Patients being offered dry needling for the treatment of LET should be made aware that there is no evidence of benefit compared to a placebo.	Conditional neutral
Patients being offered surgery for LET should be made aware that there is no evidence of benefit compared to a placebo.	Conditional neutral
Patients choosing to have surgery for LET may have treatment with an open or arthroscopic technique.	Conditional neutral
Autologous blood injection should not be used in the treatment of LET.	Conditional
Orthotics may be offered in the treatment of LET but patients should be made aware that they may not give benefit.	Conditional
Topical or oral NSAIDs can be used for short-term pain relief in LET (up to 4 weeks). Topical NSAIDs may be preferred due to the potential gastrointestinal side effects of oral NSAIDs.	Conditional

provides significant improvement in overall outcome in the short term but no difference in the medium and long term. Lower-quality evidence suggests that physiotherapy may result in significantly reduced pain and disability in the long term but certainty is low. The evidence is limited by a lack of high-quality studies measuring mid- and long-term outcomes, and the lack of studies using validated outcome measures.

Is there a role for corticosteroid injection in the treatment of LET?

A search was conducted for the meta-analyses of randomised trials and randomised controlled trials comparing the effectiveness of corticosteroid injections versus no intervention or placebo. The search yielded in 20 systematic reviews and 43 RCTs, of which 4 met the inclusion criteria and were included in this review (3 systematic reviews[11,13,14] and 1 RCT[15]).

There is strong evidence that corticosteroid injections should not be used in the treatment of LET. This recommendation is based on three meta-analyses of randomised controlled trials (RCTs) and one recent RCT. The clinical evidence was rated from moderate to very low quality. The evidence in these studies were downgraded due to the risk of bias associated with the RCTs considered. The evidence also showed inconsistency caused by heterogeneity between studies. Those studies, although weak to moderate in quality, suggest that corticosteroid injections alone does not improve the outcomes of LET. Minor improvement in pain scores was seen in the first month but by six months this effect was reversed such that the outcome was worse than that with a placebo.

Does imaging help decision making in some patients with LET?

We searched for studies discussing the role of imaging in management decisions of LET.

No relevant randomized controlled trials or high-quality literature were found during the literature search for this PICO question.

Imaging should be considered for patients with symptoms of LET only where there is diagnostic uncertainty. There is currently no evidence for or against the use of imaging in the management of LET. The consensus of the Guideline Development Group was that imaging may have a role when the diagnosis of LET is uncertain.

Is there any difference between ultrasound and MRI scan in helping the management of LET?

We searched for studies discussing the role of imaging in the management decisions of LET, and studies comparing

the difference between ultrasound and MRI. No randomized controlled trials or high-quality literature was found during the literature search for our PICO question.

The choice of imaging modality in patients with symptoms of LET but with diagnostic uncertainty will depend on the patient and local organisation factors. No comparative studies were identified that addressed the PICO question. The consensus of the Guideline Development Group was that if imaging was felt to be necessary because of diagnostic uncertainty, the choice of modality would be dependent on the patient and local organisation factors.

Are non-steroidal drugs effective in the management of LET?

We searched for systematic reviews of randomised trials comparing the effectiveness of topical and oral NSAIDs versus placebo. One systematic review[16] was identified that addressed the research question.

Topical or oral NSAIDs can be used for short-term pain relief in LET (up to 4 weeks). Topical NSAIDs may be preferred due to the potential abdominal side effects of oral NSAIDs.

Topical NSAIDs. Our conclusions are limited by a lack of high-quality trials. The quality of evidence for topical NSAIDS versus the placebo is low to very low. Our results suggest that topical NSAIDs are significantly more effective than the placebo in the short term for pain relief (up to 4 weeks). However, firm conclusions cannot be made due to the methodological deficiencies of the individual studies.

Oral NSAIDs. Our results are limited by a lack of high-quality trials. In the one trial that could be included in our analysis, oral NSAIDs provided a small but statistically significant greater improvement in pain compared with the placebo at 28 days. This study was of low to very-low quality and therefore firm conclusions cannot be made. It should be noted that this study also involved the immobilisation of all elbows in a long arm cast for 14 days.

Is physiotherapy beneficial if symptoms are present beyond 12 months?

We searched for randomised trials comparing the effectiveness of physiotherapy versus no intervention in the management of chronic LET with a duration of symptoms greater than 12 months. There were no studies within our search parameters that addressed this specific group. Within the literature search that was performed there were only three studies that looked at the use of physiotherapy in patients with a mean duration of symptoms greater than 12 months.[17–19] In all three of these studies, however, patients who had had their symptoms for less than 12 months were included. This meant that we were unable to draw conclusions from the data presented as the effect observed could be confounded by the inclusion of patients outside our required study population as per the PICO characteristics of the review question. Moreover, none of these three studies included a true control group (with no intervention), instead of comparing either two forms of physiotherapy[17,18] or physiotherapy versus corticosteroid injection.[19] The effects observed in these studies therefore cannot be concluded to be a result of the interventions used. This is particularly relevant when considering a systematic review by Ikonen et al. in 2022[5] which demonstrated a tendency for LET patients to improve without any intervention with 89% of patients having global improvement or symptom resolution in the first year. Furthermore, the improvement seen in their study was independent of the symptom duration suggesting that their findings may also apply to this question with patients with more than 12 months of symptom duration.

There is no evidence for or against the use of physiotherapy in patients who have symptoms for greater than 12months. The consensus of the Guideline Development Group was that patients who have symptoms for longer than 12 months may be offered physiotherapy to support them during their recovery particularly if they have not been offered physiotherapy before on the basis that physiotherapy has been shown to shorten the duration of symptoms at earlier time points.

Is post-operative physiotherapy helpful in the management of LET?

We searched for randomised trials assessing the role of physiotherapy after surgery. No trials were identified that would address this PICO question. No other lower levels of evidence were identified.

There is no evidence for or against the use of physiotherapy in this patient subgroup. No trials were identified that would address the PICO question. The consensus within the Guideline Development Group was that patients may be offered physiotherapy after surgery for LET to support them during their recovery.

Should PRP be offered to patients with LET?

We searched for randomised trials comparing the effectiveness of PRP in patients with LET.

We identified two systematic reviews[20,21] and seven randomised trials.[22–28]

Patients being offered PRP for the treatment of LET should be made aware that it may have no benefit over a placebo. The current evidence does not show any effect of PRP compared to the placebo for the outcomes of pain

and function. The evidence available is of very low-quality and no firm conclusions can be drawn.

Should autologous blood injection be offered to patients with LET?

We initially searched for randomised trials comparing the effectiveness of autologous blood injection versus placebo (e.g., sham needle injection). There were no available studies with this comparator. Therefore, we searched again for randomised trials comparing the effectiveness of autologous blood injection versus normal saline injection. Two randomised controlled trials[22,29] were identified.

Autologous blood injection should not be used in the treatment of LET. There is moderate to very low-quality evidence to suggest that autologous blood injection offers no significant clinical benefit over saline injection for patients with lateral elbow tendinopathy. There was no significant difference in the critical outcome (PRTEE score) at 26 weeks. It must be highlighted that these studies define a 'placebo' as a saline injection. There may be some clinical benefits from the saline injection (dry needling). There are no high-quality studies quantifying the effect of ABI vs. 'a true placebo'. More work is needed to compare the effectiveness of ABI vs a true placebo (e.g., sham needle injection).

Should dry-needling be offered to patients with LET?

We searched for trials investigating the effectiveness of dry-needling in LET. Seven hundred and sixty-four studies were assessed and after exclusions no studies were identified that compared dry needling to the placebo.

Eight studies were identified that compared dry-needling to a comparator treatment and were included in a supplemental narrative review. All of these studies used different dry-needling protocols and there was significant heterogeneity in the outcome measure choice, outcome interval and comparator groups. This variability in study design inhibited the ability to perform a meta-analysis of treatment efficacy. A non-comparative assessment of treatment effect (standardised mean difference) was undertaken for the dry needling intervention groups finding positive response (improvement in PROMs) at three weeks (SMD 4.0, (95% CI 2.3, 5.7)) and 6 months (SMD 3.8 (95% CI 2.3, 5.3)). Two studies compared dry-needling to corticosteroid injection.[30,31] However, differences in the PROM used (PRTEE and DASH) prevent meta-analysis of outcomes for these interventions. In these studies, Uygur et al.[30] demonstrated the superiority of DN to CS injection, whilst Gungor et al.[31] did not. Dry-needling treatment protocols between the studies were markedly different in keeping with technique variations across all studies. In the remaining included studies, dry-needling was superior to Ibuprofen with arm bracing[32] and Kinesio taping or stretching exercises.[33] However, it was found to have equivalent efficacy to open surgery,[34] autologous plasma injection[35] or PRP injection[31] and the study suggested it to be inferior to percutaneous electrolysis.[36] A large randomised controlled trial reported by Mishra (2014),[27] in 230 patients, reported dry-needling to be equivalent to PRP at 12 weeks but inferior at 24 weeks. The quality of the evidence was low in four, moderate in two and high in two studies. No adverse events from dry-needling were reported in any of the included studies.

Patients being offered dry-needling for the treatment of LET should be made aware that there is no evidence of benefit compared to a placebo. No studies were identified that addressed the PICO question. Eight studies were identified that compared dry-needling to a comparator treatment. However, due to the differential application of the dry-needling technique and lack of a consistent comparator group the results from these studies can only be presented in a narrative format.

Analysis of patient-focused outcomes demonstrated a large positive effect size (SMD) for improvement in pain and function from dry-needling over the short (weeks) and medium term (6 months). It is, however, impossible to demonstrate that this is superior to any other intervention, or indeed to no intervention for LET. Based on the limited and highly heterogeneous evidence available, it is not currently possible to recommend dry-needling for treatment of LET.

Is there a role for orthotics in the management of LET?

We searched for randomised controlled trials and systematic reviews of randomised trials comparing the effectiveness of forearm or wrist orthoses versus no orthotic. One systematic review[37] and one randomised controlled trial[38] not included in the systematic review were identified.

The systematic review included seven cross-over trials comparing the immediate effects of orthoses on a variety of outcomes including pain-free grip strength, maximum grip strength which were considered important for this review.[37] Other outcomes reported were not considered to be important. This review found low-quality evidence for an effect of an orthosis on increasing pain-free grip strength but the effect of orthoses on outcomes over a period of time was not assessed. A small randomised trial comparing the effects of counterforce bracing (n = 17) to placebo bracing (n = 14) over a period of 26 weeks was examined.[39] The results of the study were only presented in the graphical form preventing further analysis and interpretation. There was no evidence of harm from the included studies.

Orthotics may be offered in the treatment of LET but patients should be made aware that they may not provide a benefit. No studies provided reliable evidence of the effect of orthosis on patients with LET over time compared to the placebo/no intervention. A single high-quality study

reported an immediate reduction in forceful grip using an elbow brace, although improvements failed to surpass measurement error thresholds (minimal clinical difference) and there was no evidence regarding the effect over time. No additional studies were identified to support these findings. The recommendation is made on the basis that there is no evidence of harm.

Is there a role for extra corporeal shock wave therapy (ECSWT) in the management of LET?

We searched for randomised trials comparing the effectiveness of extracorporeal shock wave therapy (ECSWT) for lateral epicondylitis (tennis elbow). Four randomised controlled trials meeting the protocol were identified but three studies[40–42] were included in meta-analysis and the evidence from these studies is summarised below. Guler et al.[43] did not present adequate data to be pooled in the meta-analysis.

Extracorporeal shockwave therapy should not be used for treatment of LET. The critical outcome was the patient rated tennis elbow evaluation (PRTEE), which is a validated outcome measure for tennis elbow. There was moderate level evidence that there was no change in this outcome up to 12 weeks. There was very low evidence to suggest any clinical significance improvement in PROMs with ECSWT when compared with placebo / sham / control at mid-term follow-up (3–6 months). The clinical evidence was rated from moderate to very low quality. The evidence was downgraded due to the high risk of bias, especially the blinding methodology. The evidence also demonstrated inconsistency in the choice of PROMs throughout RCTs.

There was very low evidence to suggest any clinical significance improvement in pain with ECSWT when compared with placebo / sham / control at mid-term follow-up (3–6 months). The clinical evidence was rated from moderate to very low quality. The evidence was downgraded due to the high risk of bias, especially the blinding methodology. There was inconsistency in pain assessment across RCTs, but the most common method remains the visual analog scale pain score.

There was very low evidence to suggest any clinical significance improvement in grip strength with ECSWT when compared with placebo / sham / control at mid-term follow-up (3–6 months). The clinical evidence was rated as very low quality due to the high risk of bias and inconsistency throughout the RCTs.

Should surgery be offered to patients with LET?

We searched for trials investigating the effectiveness of surgery in LET. A total of 643 studies pertaining to surgery were returned via the search strategy. These were then reviewed via title, abstract and full manuscript screening to identify reports of the primary research investigating surgery for LET.

Studies comparing surgical techniques (i.e., arthroscopic surgery versus open, or a comparison of two open surgical techniques) were excluded. Dry-needling was not considered surgery irrespective of the environment (i.e., neither outpatient or theatre settings). Furthermore, trial protocols, case series with no comparative arm and reviews were not included.

Six primary studies were identified, four prospective randomised trials and two retrospective observational studies. Given the availability of prospective research data and the inherent associated bias with retrospective and observational studies, two studies were excluded. Further studies were removed from further analysis as control groups underwent intervention (extracorporeal shockwave therapy or autologous platelet-rich plasma) which meant the relative effect of the surgery could not be determined.

One prospective randomised controlled trial (Kroslak 2018)[39] investigated the surgery (open debridement) compared to the sham surgery. However, this study had multiple methodological flaws (including tendon incision in both groups, non-validated descriptors for outcome measures, and unblinding at six months), small numbers of recruited patients (13 per group) and results published in the graphical format without supporting numerical figures. In addition, the authors chose outcome measures that were verbal descriptors from questionnaires based on Likert and L'Insalata measures. As such these were not standardized scoring systems. Results from this trial were challenging to interpret as they were presented as categorical data with conclusions drawn from improvements of each arm from baseline rather than direct comparison from one another. They were also presented in the graphical format without numerical data presented to perform further analyses.

Patients being offered surgery for LET should be made aware that there is no evidence of benefit compared to the placebo.

Should patients undergoing surgery be offered arthroscopic or open surgery?

We searched for randomized controlled trials or systematic reviews evaluating the effectiveness of arthroscopic and open surgery for the management of lateral elbow tendinopathy. Original articles were then sourced from any review articles. 698 results were screened by title and 17 by full text. We identified two randomized controlled trials[44,45] targeting the review question which showed no difference in the outcome when arthroscopic and open surgical approaches were used.

Patients choosing to have surgery for LET may have treatment with an open or arthroscopic technique. The

evidence is limited by small sample sizes and lack of medium- and long-term outcome measures.

What is the role of novel therapies in the management of LET?

Percutaneous ultrasonic tenotomy (PUT): in a systematic review (Vajapey 2021),[46] five of the seven studies reviewed involved the use of PUT for elbow tendinopathies (76 patients). There were statistically significant improvements in pain/disability scores for all outcome measures in one year, including VAS, DASH-work, DASH-compulsory and Q-DASH. One study (Ang 2021)[47] found a sustained improvement in pain relief and functional recovery at 9 months in their cohort of 19 patients, as well as sonographic tissue healing at 16 months. No comparative studies were identified.

Dextrose prolotherapy (DPT): a meta-analysis (Zhu 2022)[48] reviewed eight studies comparing DPT against active control groups. Outcome measures included VAS, handgrip strength, PRTEE and DASH. Pooled results from four RCTs favoured DPT compared with active controls in reducing pain intensity at 12 weeks (SMD = -0.44, 95% CI, −0.88 to −0.01, P = .04) and I2 = 49%. Pooled results also favoured DPT compared with active controls on DASH at 12 weeks, PRTEE at 12 weeks, and grip strength at 12–16 weeks. However, the total participant size was small, and the time-frame of 12–16 weeks available for data pooling was short, so more data is needed on longer-term outcomes. Publication bias could not be assessed and there was a large variation in the active controls used.

Iontophoresis: three small prospective studies compared dexamethasone delivered by iontophoresis against corticosteroid injection (Stefanou 2012),[49] Cyriax-type exercises (Fathy 2015),[50] and galvanic current (da Luz 2019).[51] All three iontophoresis groups showed improvements in outcome measures compared to baseline, and mixed results against the comparison groups.

Transcatheter arterial embolization (TAE): we did not identify any RCTs in the literature for TAE. A case series from Japan (Iwamoto 2017)[52] with 24 patients demonstrated improvements in VAS, quickDASH and PRTEE at all time intervals up to 24-months compared to the baseline.

Bone marrow aspirate injection (BMAI): we did not identify any RCTs in the literature for BMAI. A case series from India (Singh 2014)[53] with 30 patients showed a significant improvement in post-injection PRTEE scores compared to the baseline. A follow up was conducted after12 weeks.

Patients being offered novel therapies for the LET of percutaneous ultrasonic tenotomy, dextrose prolotherapy, iontophoresis, transcatheter arterial embolisation and bone marrow aspirate injection should be made aware that there is no evidence of benefit compared to placebo. All novel interventions should be assessed in prospective randomised trials. The quality of evidence is very low. Given the novel nature of the interventions and the limited evidence supporting the above therapies, we recommend that they should only be used in trials.

What are the risk factors for recurrence of LET?

Although various prognostic factors are discussed in the literature, little information is available regarding the rate at which lateral elbow tendinosis recurs or the percentage of patients who need surgical intervention. In a recent retrospective chart review study, the 2-year recurrence rate of LET was 8.5%.[54] Data from other types of tendinopathy show that older age and short recovery periods were predictors of recurrent tendinopathy.[55] Other patient-specific factors include manual worker, radial tunnel, and prior orthopaedic surgery. In some reports, chronic LET for more than 12 months, acute pain at onset, and corticosteroid injections were associated with a higher risk of recurrence.[56,57] Inadequate adherence to the management plan was linked to a higher risk of LET recurrence.[58]

What surveillance tools should be used in the management of LET?

An international consensus document was published in 2020,[59] stating that nine health-related domains should be measured as a minimum in tendinopathy research. These were: a patient rating of condition, participation in life activities (day to day, work and sport), pain on activity/loading, function, psychological factors, physical function capacity, disability, quality of life, and pain over a specified time. Based upon these nine domains, a core outcome set[9,60] was developed for patient populations with LET. A systematic review of 256 randomised controlled trials found 60 different measurement instruments had been previously used. These were filtered using the OMERACT system, assessed for quality by the EMPRO psychometric evaluation tool and recommendations decided via an international consensus involving expert clinicians, researchers and patients. It was agreed that the patient-reported tennis elbow evaluation (PRTEE) questionnaire should be used to measure disability but this was the only firm recommendation that met all of the inclusion criteria. The patient rating of condition, quality of life and psychological factor domains lacked any recommendations. Interim recommendations were made to use PRTEE sub-scales, time off work, pain- free grip strength and a numerical rating scale measuring pain on gripping as measures of function, pain over a specified time, participation in life activities, physical function capacity and pain on activity/loading. A template of the recommended tool is publicly available (supplementary file 4): https://bjsm.bmj.com/content/56/12/657.

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