■ ANNOTATION

Is it time to reconsider the indications for surgery in patients with tennis elbow?

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Tennis elbow (lateral epicondylitis or lateral elbow tendinopathy) is a self-limiting condition in most patients. Surgery is often offered to patients who fail to improve with conservative treatment. However, there is no evidence to support the superiority of surgery over continued nonoperative care or no treatment. New evidence also suggests that the prognosis of tennis elbow is not influenced by the duration of symptoms, and that there is a 50% probability of recovery every three to four months. This finding challenges the belief that failed nonoperative care is an indication for surgery. In this annotation, we discuss the clinical and research implications of the benign clinical course of tennis elbow.

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Introduction

Tennis elbow (or lateral epicondylitis or lateral elbow tendinopathy) is a common condition causing lateral elbow pain and disability in middle-aged adults.[1] Its prevalence is strongly associated with age, rising sharply after the age of 30 years, peaking between the ages of 45 and 65 years, and being rare after the age of 65 years.[1,2]

Indirect evidence suggests that tennis elbow has a benign clinical course. A screening study found that between 1% and 2% of people between the ages of 35 and 55 years have typical clinical findings of tennis elbow, but the reported incidence in the same age group is less than half of that.[1-3] This suggests that many patients with tennis elbow never see a doctor. Furthermore, about half of those who are diagnosed with tennis elbow only visit a doctor once or twice, and three-quarters are no longer seeking care three months after their initial visit.[2] Another indicator of its excellent long-term prognosis is that despite the lack of a specific cure, the condition is rare in people aged > 65 years.[1,2]

The direct and indirect costs related to the treatment of tennis elbow are considerable. Registry studies have shown an annual incidence of 30 to 45/10,000 people in the USA, suggesting a high use of primary healthcare resources. Of these patients, an estimated one in 50 eventually undergo surgery, and up to one in ten of those with symptoms for > six months have surgery,[3] despite the lack of evidence that this provides benefit.[2-5] According to an insurance database study, the costs of surgery doubled between 2007 and 2014.[3] Tennis elbow is also associated with high indirect costs (e.g. lower productivity or absence from work), particularly for blue collar workers.[6]

In order to study the clinical course of tennis elbow, we pooled data from patients in the control arms of published randomized controlled trials (RCTs) studying the effects of various forms of treatment.[7] Our data suggest that the symptoms of tennis elbow have a half-life of between three and four months. At every three- to four-month interval, half of the patients in the control arms (those not receiving active treatment) reported that their symptoms were either much better or had resolved completely. This rate seemed constant, with only 10% of patients reporting no recovery after one year despite most having symptoms for many months before joining the trial. The mean pain and disability (on a group level) followed a similar half-life trajectory. The mean pain and disability halved every four months, approaching between 15% and 20% of the baseline values at the end of the first year.

On an individual level, a steady half-life means that the duration of symptoms or length of follow-up could be largely irrelevant and provides little prognostic value. It also means that the future course is completely unpredictable. Recovery seems to be a random process akin to the biological half-life of drugs. A molecule lasting several half-lives is no different from a molecule that is eliminated first. This does not mean that a patient should expect their symptoms to halve every four months, but rather that the probability of recovery in future persists irrespective of the time passed.

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While the underlying mechanisms for the half-life pattern are unclear, these findings have relevance for everyday clinical practice and future research. In this annotation we discuss what the findings mean for the usual practice of operating on patients whose symptoms fail to settle with nonoperative treatment. Second, we consider how the findings influence the interpretation of other studies. Finally, we discuss what our advice should be to patients who are frustrated by long-standing symptoms and seek advice about whether surgery should be undertaken.

'Failed' nonoperative treatment

Failed nonoperative treatment as an indication for surgery is an uncontested principle of musculoskeletal surgery. The assumption is that those with persistent symptoms have a different prognosis and that time sifts out a subgroup who simply will not recover spontaneously. Then, if the symptoms resolve after surgery, we assume that this occurred because of the operation – a logical fallacy called post hoc, ergo propter hoc.

Our data, however, suggest otherwise.[7] The duration of symptoms does not seem to be associated with recovery at all. For example, patients in the placebo surgery group of a study by Kroslak and Murrell[5] had a mean duration of symptoms of six years. Nevertheless, their symptoms resolved as promptly as in those in the surgical group. Similar findings were seen in most patients in the control groups of the trials which were included in our review, despite them receiving no biologically active treatment.

The problem with 'failed' nonoperative treatment is that we cannot predict who will 'fail' nonoperative treatment, or when it has failed. Furthermore, once we consider nonoperative treatment to have failed, it does not mean that surgery will be effective. Based on our findings, the probability of recovery does not change with the passage of time, meaning that it is a constant irrespective of a short or long duration of symptoms. It thus makes no sense to advise surgery after an arbitrary period of time unless rigorous evidence from RCTs indicates otherwise; currently, it does not.

Careful patient selection

If recovery occurs randomly, how can we identify a subgroup of patients who are likely to benefit from surgery? Even if the process is only seemingly random, we can consider it random if we do not understand the determinants behind the process. Even if experts believe that they can identify patients who will not recover with nonoperative management – which we doubt because evidence shows that prediction is difficult even for experts – that would not solve the problem.[7,8] If this was possible, we should be able to spell out the characteristics of patients who will not recover and be able to apply it widely. Currently, so-called careful patient selection is merely a retrospective concept: we managed to select carefully those patients who were happy with the outcome. Those who were not happy were not selected carefully. However, we do not know what would have happened to them if they had not had surgery; maybe most would have recovered, as our data suggest.

Prognostic factors may not offer help. People with more pain at the time of presentation or do more strenuous work report more pain at follow-up.[9-11] However, this could be related to the measurement as well as the perception of pain, and these patients may report more pain after surgery. In other words, pain or physical strain at work may be prognostic, but it does not mean that they are modifiers of the effects of treatment. Previous studies failed to identify any factors influencing the treatment effect of steroid injections compared with no treatment, or exercise, for tennis elbow, although injections showed benefits in the short term.[11]

Implications for conducting and interpreting clinical research

Most patients with tennis elbow recover, but not all. Thus, intriguing research questions remain, and future studies could try to explain why this is the case. The reasons are likely to be multifactorial including biological, psychological and social factors. Patients with a poor prognosis are those who have the greatest potential to benefit from surgery. However, if psychological and social factors were responsible for poor recovery, they may also have a poor prognosis with surgery, as surgery does not control these factors.

Instead of wasting research on observational studies, we should direct our resources to sufficiently powered rigorous trials dealing with the efficacy of treatment. At best, the benefits of surgery are transient as most people recover eventually. Indeed, for surgery to be beneficial it would need to deliver benefits quickly to be able to improve on the natural course of the condition. For example, with an expected 75% recovery rate in the no-treatment arm at six months, a 90% recovery rate would mean only a 15% difference in risk (corresponding with a number needed to treat of 6.7). In order to show such a difference, 200 patients would need to be recruited and followed up (with 0.8 power) and the benefit would be lost by nine months. Transient benefits could, however, be important for people who are on sick leave and anxious to get back to work. This might be a group of interest for surgical efficacy trials.

Another important issue is the interpretation of studies dealing with tennis elbow. Observational studies showing high rates of recovery after an intervention are largely redundant as recovery is, most of the time, not explained by the intervention. Furthermore, we should be suspicious when large long-term effects of any intervention are found in a trial, as the known excellent prognosis for patients with this condition does not provide room for large effects. In our review, we identified three control groups which had strikingly poor long-term outcomes for no apparent reason, based on the inclusion and exclusion criteria.[12-14] These studies showed large long-term benefits for the active intervention. However, if we compare the active groups from these studies with the average trajectory across all studies, there would have been no effect at all. The long-term effect may have occurred because of an unexplained poorer prognosis in the no-treatment group (i.e. baseline imbalance), but such large effects are not plausible outside these studies, since most patients recover without treatment. Large effects could be achieved only by identifying a subgroup of patients who do not recover spontaneously and treating them with an effective form of treatment.

Clinical implications

The mechanical rationale for surgery for tennis elbow in patients with chronic tennis elbow appears compelling. By removing tendinopathic tissue or releasing tension from it, the problem is notionally solved. Certainly, many patients get better. But if the source of the pain is gone, why do we see recovery rates of only between 80% and 90% after surgery?[15] Complications could explain some and misdiagnosis others. But the problem is that the outcomes seem very similar to the outcomes after placebo surgery or no treatment, making the rationale for surgery less compelling.[5,7]

The best current experimental evidence suggests that surgery may not be efficacious, but it is based on a single small placebo-controlled trial.[7] It may be possible that surgery could be beneficial for some subgroups.[5] However, until trials of surgery demonstrate benefit in particular subgroups, we should inform our patients about the favourable prognosis from tennis elbow even in those with longstanding symptoms instead of recommending that they 'try' surgery as a last resort. Many patients would be relieved to hear this.

Take home message

- Symptoms of tennis elbow seem to have a steady half-life of between three and four months, indicating that longer symptom duration does indicate poorer prognosis without surgery.
- Failed nonoperative treatment should not be used as an indication for surgery unless we can reliably identify people who will not recover without surgery in the near future.
- Until rigorous trials demonstrate efficacy of surgery, people with longstanding symptoms should be informed about the favourable prognosis instead of trying surgery as a last resort.

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