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## Title:

Management of partial extensor tendon lacerations of the hand and forearm: A national survey of practice in the UK

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## Abstract

Background: Partial extensor tendon lacerations of the hand and forearm are common. There is a lack of evidence to guide management and it is unclear at what threshold surgeons would consider repair necessary. The aim of this study was to identify national surgical management of partial extensor tendon lacerations of the hand and forearm (zones 2-8) and to assess surgeons' willingness to randomise to a future trial.

Methods: A~~n~~ 34-item online survey was developed by the steering group and, via a trainee-led collaborative model, was disseminated to UK plastic and orthopaedic surgeons. Summary data were calculated for each survey item, and variation between zone and specialty were explored using linear regression.

Results: 142 complete responses were recorded (response rate 71%). On average, respondents said that 46% tendon division was the maximum they would manage in clinical practice

without surgical repair. There was no significant difference in this percentage between zones or surgical specialty. However, ~~Surgeons would be willing to manage without repair a maximum of 46% tendon division.~~ t~~T~~he ~~vast~~ majority (83%) of surgeons would be willing to randomise patients in a trial to repair versus no-repair, within a range of 29-61% tendon division, demonstrating clinical equipoise.~~. There was no significant variation between extensor zones or specialties.~~

Conclusions: There is significant variation in UK practice regarding the surgical management of partial extensor tendon lacerations of the hand and forearm and clinical equipoise exists regarding the decision to repair or not. A definitive randomised trial is warranted to identify optimum management of this common injury.

## Keywords

Hand trauma, tendon injury, extensor tendon, survey

## Introduction

Injuries to the extensor tendon apparatus of the hand and forearm are one of the most common presentations to the acute hand trauma service with over 5000 incidents per year in the United Kingdom[1]. Tendon lacerations typically occur in the younger, working age population and impart significant socioeconomic impact on the individual and wider society[2,3].

Complete traumatic lacerations of the extensor tendons are generally managed with surgical repair and splintage[4]. In partial tendon lacerations, whereby some of the tendon fibres remain intact, the optimum management is an area of clinical uncertainty. The 50% rule implies that

lacerations involving more than 50% of tendon fibres should be surgically repaired. This has historically been used as a decision-making tool for tendon injuries[5] but lacks evidence to support its application in the hand and forearm[6], and in particular for extensor tendon injuries[6].

The decision to repair a partial tendon laceration is important. Partial laceration of tendons reduces their tensile strength[7] which theoretically increases the risk of rupture; however, a previous systematic review found no ruptures in 45 patients with partially lacerated extensor tendons in the hand and forearm. Counterintuitively, ~~Tendon~~ repair of partially lacerated tendons may further decrease tensile strength.[7] ~~and gliding~~ Previous animal and cadaveric studies have demonstrated that repaired partially lacerated *flexor* tendons have lower tensile strength, increased resistance and decreased tendon gliding than non-repaired tendons[8–10], which may in part be due to the trauma of suture insertion and the development of an acellular zone around suture material[11,12]. Furthermore, t~~T~~endon rupture ~~is a known risk~~has been reported following surgical repair of a partial extensor tendon laceration[13]~~.~~. Finally, current rehabilitation protocols~~,~~ tend to ~~and~~ condemn patients to a lengthy rehabilitation period after tendon repair, with significant associated personal and healthcare costs. On the other hand, s~~S~~elective *non-repair* could reduce the risk of tendon rupture, ~~potentially~~ reduce the morbidity associated with tendon injury through earlier return to activities and work, ~~and~~ as well as reduce~~d~~ the burden on hand therapy services. ~~Tendon rupture is a known risk following surgical repair of a partial extensor tendon laceration[11]. Equally, unrepaired partially lacerated tendons might be at risk of rupture due to a reduction in tensile strength.~~

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The lack of evidence on how to manage this common condition poses a challenge for treating clinicians, and for patients, with no robust data to inform national guidelines. Further

research is therefore warranted. The aim of this study was to survey UK hand surgeons regarding the management of partial extensor tendon lacerations of the hand and forearm (zones 2-8), to assess whether current UK practice reflects the lack of evidence in the literature, and to inform a potential future randomised control trial. We hypothesise that self-reported current practice reflects "the 50% rule".

## Methods

The online survey (Supplementary Material 1) was developed by a steering group of plastic surgeons with experience in survey methodology (n=7). A pilot was undertaken with consultant plastic surgeons (n=8) at Stoke Mandeville Hospital (Aylesbury, UK) to assess content and face validity, and adjustments made prior to national distribution. Pilot respondents were asked to complete the survey and provide feedback after which minor changes were made to the wording for clarity, and the format of responses to questions regarding the % of tendon laceration (numerical sliders changed to typed numerical percentages due to difficulties using the sliders, particularly on mobile devices).

The final survey consisted of 34 items including questions relating to: respondent demographics (specialty, job title, place of work), confirmation that respondents treat patients with extensor tendon injuries of the hand and forearm, respondents' management of isolated single partial extensor tendon lacerations (adult patients, zones 2-8), and their willingness to randomise a patient to repair versus non-repair. Respondents were asked four identical questions for each zone of injury (see Figure 1 for example survey items for zone 2 injuries).

Closed injuries, ~~zone 1 injuries (i.e. open mallet injuries),~~ and injuries to the thumb were ~~all~~ excluded. Zone 1 injuries (i.e. open mallet injuries) were also excluded as the management of these injuries may be determined by additional factors not relevant to the other extensor tendon injury zones (for example the degree of distal-interphalangeal joint subluxation), and the surgical approach may differ (for example the use of dermatotenodesis). Furthermore, guidelines on the management of mallet injuries (including open injuries) have previously been published in the United Kingdom which recommend surgical washout and then manage as per closed injures; the majority of which are managed non-operatively[14]. Zone 3 lacerations were defined as central slip injuries, and zone 8 were defined as tendinous injuries (not muscle belly). Surgical repair was defined as the use of sutures to repair a tendon laceration (by any method). Non-repair was defined as washout of the wound and skin closure, with or without splintage and rehabilitation. The survey including information provided to surgeons responding is available (Supplementary Material 2).

| **Zone 2** | |
|---|---|
| For a patient with a zone 2 injury, what is the highest % tendon laceration you would manage without surgical repair? | _____ (Please enter a number between 1 and 100 (no % symbol required)) |
| At the time of exploration would you be willing to randomise a patient with a partial zone 2 laceration to either surgical repair (by any method) or non-repair? | ◯ Yes ◯ No (Please note: if 'yes' selected you will be able to specify a % range in which you would be willing to randomise a patient (for example between 20-80%)) |
| What would be the lowest % tendon laceration you would be willing to randomise to surgical repair versus non-repair? | _____ (Please enter a number between 1 and 100 (no % symbol required)) |
| What would be the highest % tendon laceration you would be willing to randomise to surgical repair versus non-repair? | _____ (Please enter a number between 1 and 100 (no % symbol required)) |

**Figure 1.** Example survey items for Zone 2 injuries.

Local collaborators (n=24) and consultant supervisors were recruited via the Reconstructive Surgical Trials Network (RSTN, https://reconstructivesurgerytrials.net/), the trainee research collaborative for plastic and hand surgery. Collaborators distributed the survey to consultant plastic and orthopaedic surgeons, and associate specialists within their centre. A map of collaborating centres was generated using Google Maps. Data collection occurred between 24th March and 29th June 2023. Study data were collected and managed using REDCap© electronic data capture tools[15], hosted by the Kennedy Institute of Rheumatology, University of Oxford. Duplicate responses were excluded, as were responses from clinicians that do not treat patients with extensor injuries of the hand and forearm. There were no incentives or remuneration for responses.

Data were analysed in Stata/MP v18. Continuous variables approximated the normal distribution and are summarised by the arithmetic mean and standard deviation (SD), alongside rank-based statistics and Raincloud plots[16] to comprehensively show the variability of responses. Variation in the percentage of extensor tendon division by zone and specialty was explored using linear regression. Non-responder analysis was performed for specialty (plastic surgery versus orthopaedics) using Fisher's exact test. 95% confidence intervals (CI) are reported. ~~As a self-reported survey of practice, ethical approval was not required.~~ Raw data are available on request.

## Results

After deduplication (n=1) and exclusion of respondents who did not treat extensor tendon injuries of the hand and forearm (n=3), 142 responses were included. The response rate was 71%. Respondents were consultants (97%, n=138), or consultant-level associate specialist doctors (3%, n=4). The majority of respondents were plastic surgeons (76%, n=108). The

remaining were orthopaedic surgeons (243.5%, n=32), ‘hand surgeon’ (n=1, 0.7%), or ‘both’ plastic and orthopaedics (n=1, 0.7%). There was no evidence of non-response bias between specialties. All survey responses were complete (there was no missing data).

Clinicians worked in 23 different centres across England (n=21), Scotland (n=1) and Northern Ireland (n=1) (Figure 2). The highest number of responses from a centre was 14 (100% response rate).


**Figure 2.** Collaborating centres

**Highest percentage extensor tendon laceration managed without surgical repair**

On average, across all zones, respondents said that 46% tendon division was the maximum they would be willing to manage without surgical repair (Figure 3, and eTable 1). There was

no significant difference between zones (p=0.112). The median and modal responses were similar across zones (50%). However, ~~particularly more~~ distal~~ly~~ ~~(~~zones (2, 3 and 4) exhibit more variability in responses (SDs 15, 16 and 13, respectively) with actual responses ranging from 1-100% (eTable 1). There was no significant difference in responses between surgical specialty (plastic vs orthopaedic surgeons). ~~However, this may be a type 2 error because Figure 3 and eTable 1 suggest that the tolerance of some surgeons for not repairing lacerations may be broader for zones 2 and 3. Specifically, surgeons may not be willing to leave larger lacerations in zone 3 un-repaired (reflected in the lower 1st quartile value of 33%) in comparison to other zones where the lower quartile values were higher, at 40% for zones 5-7 and 50% for zones 1, 4 and 8.~~

~~It appears that at the level of the PIPJ and distally there is considerably uncertainty. In zones 2 and 3, 5% of surgeons would manage >75% lacerations without repair and a small number of surgeons even indicated that they would even manage 100% lacerations without repair (zone 2: n=4, zone 3: n=3). Conversely, two surgeons said they would repair lacerations of <5%. Interestingly, we observed smaller variability in surgeon tolerance for non-repair in the more proximal zones (particularly zones 4 and 8) which might represent truly smaller tolerances for non-repair proximal to the proximal interphalangeal joint, but may equally represent responder fatigue.~~

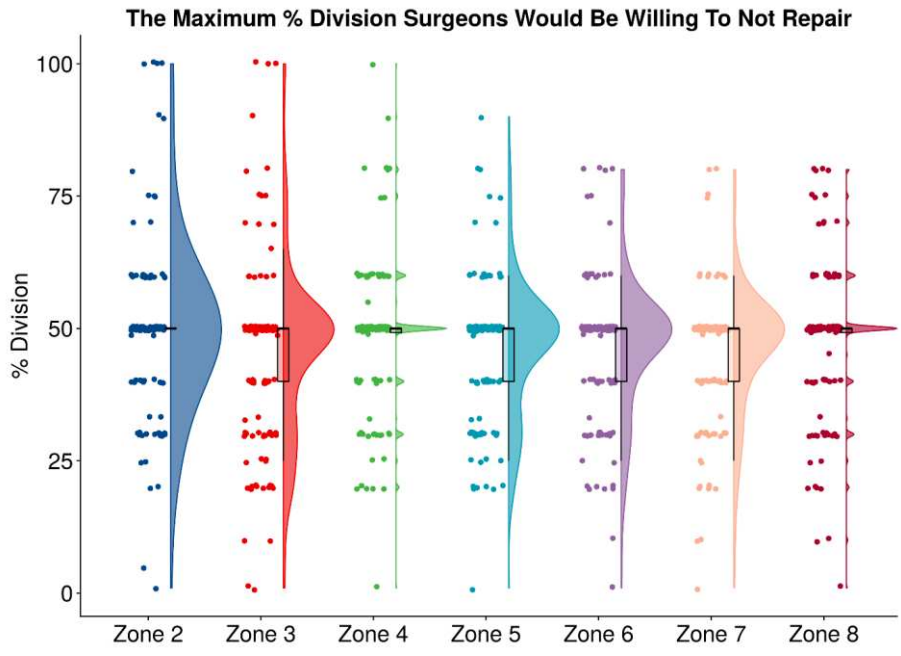


**Figure 3.** A raincloud plot showing that the ~~average~~ mean maximum % of extensor division that surgeons would be willing to not repair was 46%, with no significant differences between zones.

**Willingness to randomise to repair versus non-repair**

The majority of surgeons (83%) were willing to randomise patients with partial extensor tendon lacerations to either surgical repair or non-repair, even in zone 3 (79%). There was no difference in willingness to randomise between plastic and orthopaedic surgeons for each zone.

**Lowest and highest percentage tendon laceration that surgeons are willing to randomise**

The mean ~~smallest~~ lowest percentage division of an extensor tendon that surgeons would be willing to randomise was 29% (SD 16, Figure 4) and this did not differ by zone (p=0.983, eTable 2) or specialty. The mean highest percentage division that surgeons would be willing to randomize was 61% (SD 16, Figure 5) which again did not differ by zone (p=0.324, eTable 3) or specialty.

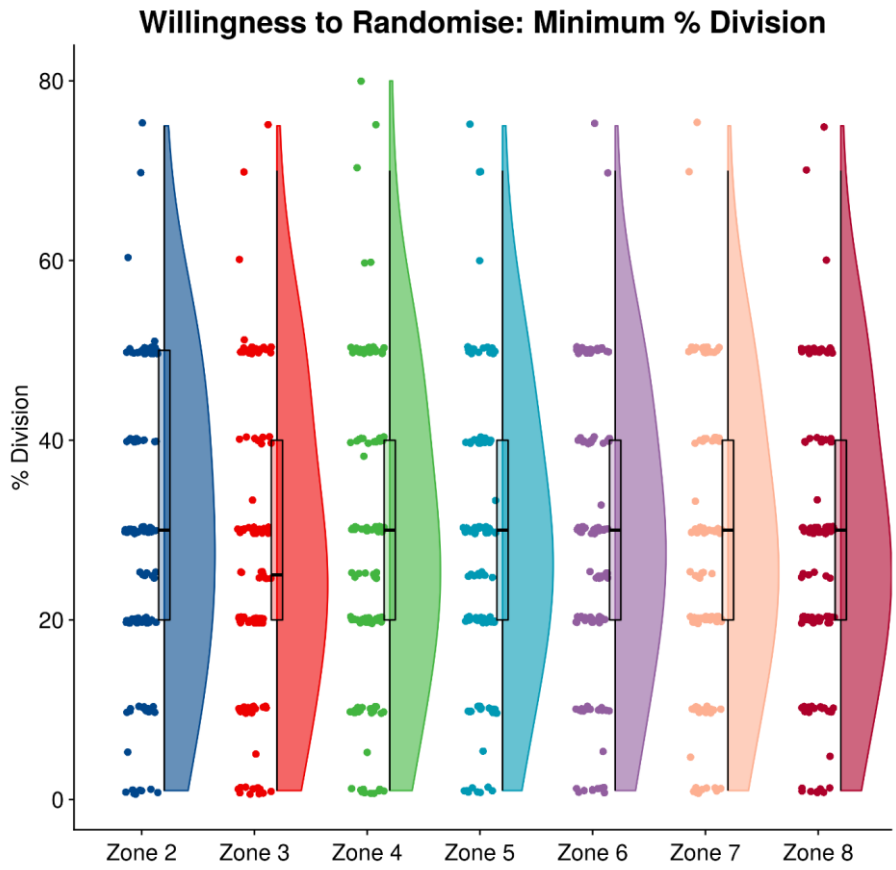


**Figure 4.** A raincloud plot showing that the minimum % of extensor division that surgeons would be willing to randomize was ~29%, with no significant differences between zones

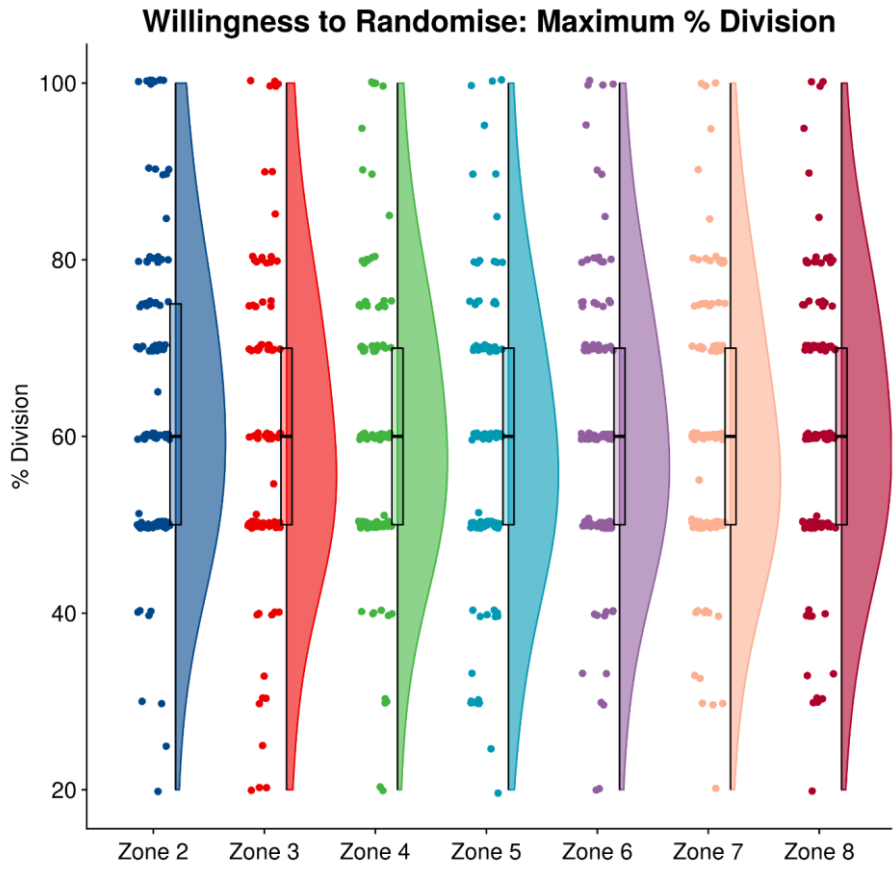


**Figure 5.** A raincloud plot showing that the maximum % of extensor division that surgeons would be willing to randomize was ~61%, with no significant differences between zones

## Discussion

This study has provided insight into current views of surgeons in the UK who manage partial extensor tendon lacerations of the hand and forearm. There was a large variation in responses for ~~all~~ extensor zones ~~(~~2-8~~)~~ regarding the highest percentage tendon laceration surgeons would manage without repair, reflecting the lack of consensus on the optimum management of these injuries. ~~For example, in zone 2, two consultant surgeons were unwilling to manage even 5% lacerations without repair, whilst four consultant surgeons were will to manage all partial lacerations, and even complete lacerations (100% division) without repair.~~

It appears that there is most uncertainty for ~~at the level of the~~injuries distal to zone 4 ~~proximal interphalangeal joint and distally there is the most uncertainty~~. In zones 2 and 3, 5% of surgeons would manage >75% lacerations without repair and a small number of surgeons even indicated that they would even manage 100% lacerations without repair (zone 2: n=4, zone 3: n=3). Conversely, two surgeons said they would repair lacerations of <5%. Interestingly, we observed smaller variability in surgeon tolerance for non-repair in more proximal zones (particularly zones 4 and 8). It is possible that surgeons are more tolerant of non-repair in distal zones due to familiarity with the non-operative management of closed zone 1 (mallet) and 3 (central slip) injuries. Although zone 1 injuries were excluded in this study, zone 2 injuries may involve only the terminal tendon and as such some surgeons may feel that they can be managed in a similar fashion to zone 1 injuries. ~~However, this may be a type 2 error because Figure 3 and eTable 1 suggest that the tolerance of some surgeons for not repairing lacerations may be broader for zones 2 and 3. Specifically, surgeons may not be willing to leave larger lacerations in zone 3 un-repaired (reflected in the lower 1st quartile value of 33%) in comparison to other zones where the lower quartile values were higher, at 40% for zones 5-7 and 50% for zones 1, 4 and 8.~~

~~It appears that at the level of the PIPJ and distally there is considerably uncertainty. In zones 2 and 3, 5% of surgeons would manage >75% lacerations without repair and a small number of surgeons even indicated that they would even manage 100% lacerations without repair (zone 2: n=4, zone 3: n=3). Conversely, two surgeons said they would repair lacerations of <5%. Interestingly, we observed smaller variability in surgeon tolerance for non-repair in the more proximal zones (particularly zones 4 and 8) which might represent truly smaller tolerances for non-repair proximal to the proximal interphalangeal joint, but may equally represent responder fatigue.~~

The mean percentage ~~injury~~ laceration surgeons would manage without repair (46%) appears to align with "the 50% rule" in keeping with our hypothesis. Whilst this rule of thumb has been previously recommended for the management of extensor tendon injuries[4,17,18], it is not supported by any robust experimental or clinical data. The 50% rule originated from a 1984 study of 122 chicken flexor tendons, in which partial tendon lacerations managed with suture tenorrhaphy and immobilisation resulted in better outcomes than those managed without repair, with a suggested threshold effect at 50%, and tendon lacerations of 75% faired significantly worse overall than those of 50% and 25%[19]. The results of this study has subsequently been extrapolated to human tendons[5]; however, a recent systematic review found no robust clinical evidence for this approach in extensor tendons of the hand and forearm[6]. Of the five ~~included~~ studies included in the review, only one cohort study (l~~L~~evel 4 e~~E~~vidence) looked specifically at partial extensor tendon injuries, and concluded that partial lacerations (55-90%, zones II, IV, VI-VIII of the fingers; and zones II, IV, and V of the thumb) could be safely managed without repair[20]. This study was limited by selection bias (patients were excluded from the study if they did not return to manual work for a minimum

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of 6 months following their injury) and lacked validated patient-reported outcome measures (PROMs). Current practice is therefore not supported by any robust experimental or clinical evidence.

~~Current practice is not evidence-based and~~ This ~~our survey~~study suggests that there is equipoise regarding the surgical management of partial extensor tendon lacerations. This is reflected by the fact that most surgeons (83%) that would be willing to randomise patients ~~within~~ in a trial to repair versus non-repair within a range of 29-61% tendon laceration. We anticipate that most surgeons would consider that lacerations of <29% do not require repair, whilst lacerations >61% should be repaired and that within this central 'grey-zone' the decision to repair is based on surgeon or local preferences, dogma (the 50% rule), and other factors relating to the patient and injury. The availability and type of rehabilitation available may also impact the decision whether to repair a partially lacerated tendon. The appropriate rehabilitation of partially lacerated extensor tendons – whether repaired or not – requires further investigation including the use of relative motion orthoses which can improve early active movement, and facilitate earlier return to work after extensor tendon repair[21].

Partial extensor tendon injuries in the hand and forearm are a common and significant injury, and therefore understanding how best to manage these injuries to ~~Addressing this uncertainty~~optimise outcomes and reduce the risk of complications is ~~a clinical priority~~important. Current management is not evidence-based, and our study demonstrates that there is significant variation in practice. ~~and~~F~~f~~urther research is warranted. Cadaveric studies of human extensor partial tendon lacerations could provide important information about tendon tensile strength and glide at varying percentages of partial tendon laceration,

with and without surgical repair. Clinical data is also lacking, and a large preferably prospective observational study would represent a significant step forward in our understanding of how these injuries are managed and patient outcomes.

To definitively answer the question of whether partial extensor tendon lacerations in the hand and forearm should be surgically repaired or not, a~~A~~ multi-centre~~, parallel,~~ pragmatic randomised ~~control~~ trial ~~(RCT) with intra-operative randomisation of patients to repair versus non-repair of partial extensor tendon lacerations c~~should be undertaken~~answer this important question, generating robust data that could inform national guidelines.~~ . The primary outcome of S~~s~~such a trial should ~~focus on~~ be a ~~outcomes relevant to hand trauma patients, including with relevant~~ patient-reported outcome measuring ~~outcome measures of~~ hand function ~~as the primary outcome.~~, Secondary outcomes could include assessment of ~~hand function, range of movement~~motion, ~~and~~ and aadverse events ~~(, including~~such as tendon rupture)and cost-effectiveness. ~~. HHealth economic analysis of repair versus no repair is also essential to determine cost-effectiveness, taking into account potential benefits of surgery, the associated risks, and the increased cost.~~

Despite significant anatomical variation across the extensor tendon zones 2-8, our study demonstrated no significant difference in either the highest percentage surgeons would manage without repair, or the range within which they would be willing to randomise between zones. This suggests that in the context of an RCT the inclusion/exclusion criteria for percentage tendon laceration would not need to vary between zones. It is possible that our survey over-simplifies the complex anatomy in certain areas (for example zone 3) and further consensus discussion between relevant parties may be required. Our study also assumes that surgeons can easily and accurately assess the percentage of tendon fibres lacerated and does

not take into account differentee orientations of lacerations (e.g. horizontal, vertical, oblique). A feasibility study is required to assess how surgeons assess percentage tendon laceration. ~~and how accurately they are able to do so. In the context of a randomised controlled trial an accurate and independent method of assessing percentage tendon laceration would be required.~~

Limitations of this study include the potential for selection bias, as well as the geographical restriction of responses to the UK. That being said, the RSTN model has allowed national representation of hand surgeon opinion, across England, Scotland and Northern Ireland. Our findings are limited to adults with single tendon injuries in extensor zones 2-8 of the digits (thumb excluded) and cannot be generalised to multiple or complex injuries. This reflects a potential future trial ~~question~~ question. ~~however~~However. ~~O~~, our survey assumes that % tendon laceration is the main factor influencing surgeons' decision to or not to repair partial tendon injuries and does not explore other factors for example the mechanism of injury, patient factors, or access to certain rehabilitation regimes for example using relative motion orthoses. Strengths include the high number of responses from a relevant population – surgeons who regularly manage these injuries. The response rate was high (71%), with no evidence of non-responder bias between specialties. It is therefore likely that the responses in our survey reflect current UK management.

## Conclusion

This survey has provided insight into the current management of partial extensor tendon lacerations of the hand and forearm in the UK and demonstrated significant variation in practice. The majority of surgeons would be willing to engage with a randomised ~~clinical~~ trial ~~to answer this important question~~comparing surgical repair with non-repair ~~of these injuries~~.

~~This~~ Addressing this question is important as there is currently a lack of evidence supporting clinician and patient decision-making, and clinical equipoise exists ~~regarding the decision to repair or not~~.

## Lay Summary

Partially cut tendons can either be allowed to heal or surgically repaired but evidence supporting the management of these injuries is limited. This survey reveals that UK surgeons repair extensor tendons of the hand/forearm if 46% or more of the tendon fibres are cut and that surgeons would be willing to recruit to a future clinical trial.

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## Conflict of Interest

The authors have no conflict of interest to declare.

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## Ethical Approval

As a self-reported survey of practice, ethical approval was not required.

## References

1. Manley OWG, Wormald JCR, Furniss D. The changing shape of hand trauma: an analysis of Hospital Episode Statistics in England. J Hand Surg Eur Vol. 2019 Jun;44(5):532–6.
2. Patillo D, Rayan GM. Open Extensor Tendon Injuries: An Epidemiologic Study. Hand Surg. 2012 Jan;17(01):37–42.
3. Robinson LS, Sarkies M, Brown T, O'Brien L. Direct, indirect and intangible costs of acute hand and wrist injuries: A systematic review. Injury. 2016 Dec;47(12):2614–26.
4. Amirtharajah M, Lattanza L. Open Extensor Tendon Injuries. J Hand Surg. 2015 Feb;40(2):391–7.
5. Pedowitz RA, Higashigawa K, Nguyen V. The "50% Rule" in Arthroscopic and Orthopaedic Surgery. Arthrosc J Arthrosc Relat Surg. 2011 Nov;27(11):1584–7.
6. Dickson K, Mantelakis A, Reed AJM, Izadi D, Wade RG, Wormald J, et al. The management of partial extensor tendon lacerations of the hand and forearm: A systematic review. J Plast Reconstr Aesthet Surg. 2023 Oct;85:34–43.
7. Hariharan JS, Diao E, Soejima O, Lotz JC. Partial lacerations of human digital flexor tendons: a biomechanical analysis. J Hand Surg. 1997 Nov;22(6):1011–5.
8. Ollinger H, Wray RC, Weeks PM. Effects of suture on tensile strength gain of partially and completely severed tendons. Surg Forum. 1975;26:63–4.
9. Reynolds B, Wray RC, Weeks PM. Should an incompletely severed tendon be sutured? Plast Reconstr Surg. 1976 Jan;57(1):36–8.

10. Lineberry KD, Shue S, Chepla KJ. The Management of Partial Zone II Intrasynovial Flexor Tendon Lacerations: A Literature Review of Biomechanics, Clinical Outcomes, and Complications. Plast Reconstr Surg. 2018 May;141(5):1165–70.

11. Wong JKF, Alyouha S, Kadler KE, Ferguson MWJ, McGrouther DA. The cell biology of suturing tendons. Matrix Biol. 2010 Jul;29(6):525–36.

12. Wong JKF, Cerovac S, Ferguson MWJ, Mcgrouther DA. The Cellular Effect of a Single Interrupted Suture on Tendon. J Hand Surg. 2006 Aug;31(4):358–67.

13. Crosby CA, Wehbé MA. Early protected motion after extensor tendon repair. J Hand Surg. 1999 Sep;24(5):1061–70.

14. British Society for Sugery of the Hand. Mallet Injuries – standards for treatment [Internet]. 2020. Available from: https://www.bssh.ac.uk/_userfiles/pages/files/professionals/Trauma%20standards/7%20Mallet%20Injuries.pdf

15. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009 Apr;42(2):377–81.

16. Judd N, van Langen J, Allen M, Kievit RA. ggrain: A Rainclouds Geom for "ggplot2". [Internet]. 2023. Available from: https://CRAN.R-project.org/package=ggrain

17. Griffin M, Hindocha S, Jordan D, Saleh M, Khan W. Management of Extensor Tendon Injuries. Open Orthop J. 2012 Feb 23;6(1):36–42.

18. Hanz KR, Saint-Cyr M, Semmler MJ, Rohrich RJ. Extensor Tendon Injuries: Acute Management and Secondary Reconstruction: Plast Reconstr Surg. 2008 Mar;121(3):109e–20e.

19. Chow SP, Yu OD. An experimental study on incompletely cut chicken tendons--a comparison of two methods of management. J Hand Surg Edinb Scotl. 1984 Jun;9(2):121–5.

20. Al-Qattan MM. Conservative Management of Partial Extensor Tendon Lacerations Greater Than Half the Width of the Tendon in Manual Workers. Ann Plast Surg. 2015 Apr;74(4):408–9.

21. Merritt WH, Wong AL, Lalonde DH. Recent Developments Are Changing Extensor Tendon Management. Plast Reconstr Surg. 2020 Mar;145(3):617e–28e.