Reviewer’s report

Title: A cadaveric and sonographic study of the morphology of the tibialis anterior tendon – a proposal for a new classification

Version: 0 Date: 09 Dec 2018

Reviewer: Sarah Stewart

Reviewer's report:

Thank you for the opportunity to review this manuscript which proposes a new classification for morphology of the tibialis anterior tendon using cadaveric dissection and ultrasound imaging. The introduction provides a good justification regarding knowledge of the anatomy of the tibialis anterior tendon as important in surgical and non-surgical treatment of tendon injuries. The aims of the study need clarification (please see relevant comment below). The results are presented well, and the inclusion of cadaveric photos are excellent and help define the different anatomical Types identified in the study. The discussion section needs more work (as per below comments). I have also included some minor comments and formatting/grammar suggestions:

ABSTRACT

Title: consider changing "radiological" to "ultrasound" or "sonographic". Also, to be consistent with the order of presentation of the methods and results, should it not be "A cadaveric and radiological (ultrasound/sonographic) study…" rather than "A radiological and cadaveric study…"

Line 5 to 6: "…the tibialis anterior tendon (TAT) presents little variation". This is quite vague/unclear. Change to "…the tibialis anterior tendon (TAT) presents little morphological variation".

Line 6: There is no need for use of the abbreviation TAM, as it is not used anywhere else in the abstract.

Line 7: Add 's' onto end of 'two-third'. Should be plural.

Line 7: Change "…the tibia shaft, the anterior…” to "…the tibia shaft, and the anterior…”

Line 9: The authors state that the aim is to "…systematize the classification of TAT insertion…", which is quite unclear. Consider stating that the aim is to "…classify types of TAT insertion…". This will need to be updated in the aims section of the introduction.

Line 17 - 21: Be consistent in capitalisation of 'T' in type. This should be checked throughout the manuscript.

INTRODUCTION
Line 31: Change "…lateral surface of the tibia shaft, on…” to "…lateral surface of the tibia shaft and on…”

Line 40: The authors state that there has been a growth in the number of TAT injuries. Please provide a reference.

Line 46: Change "making" to "obtaining"

Line 50: Change "foot orthosis" to "foot orthoses".
Line 53: Be consistent in use of pre-stated abbreviations. When referring to the tibialis muscle use your abbreviation of TAM.

Line 59: The aim should be stated in past tense: Change "the aim of our work is to…” to "the aim of our work was to…”

Line 61: Change "living patients" to "healthy volunteers"

Line 61: Change "The knowledge gained regarding the variability of its attached of the TAT…” to "Knowledge of the variability of the attachment of the TAT…”

Line 62: Change "will" to "may"

MATERIALS AND METHODS

Line 66 and Line 91: change "studies" to "study"

Line 70: what department? What university?

Line 71: can you be more specific with regard to "sufficient specimen quality"?

Line 72: change "…area; this is needed…” to "area, which was needed…”

Line 75 to 76: This heading isn't needed. Remove.

Line 87: why was each measurement undertaken twice? Was the mean used for analysis? If so, this needs to be detailed here.

Lines 88-89: it is stated "If they differed by more than 20%, one was recognised as smaller and the other as larger." Why?

Line 89-90: This ethics sentence can be moved up to line 65 and changed to "Consent was obtained from the Local Bioethical Commission to perform the anatomical and sonographic stages"

Line 92-93: be consistent with use of either "tibialis anterior muscle" or "TAM".
Line 95: the mean (range) of participants' ages is described. What about gender? Were there any inclusion/exclusion criteria for the participants who were in the sonographic study? I.e. history of tibialis anterior injury?

Line 97: was the right or left foot scanned? Or both feet?

Line 103-104: remove ethics statement (already included above)

STATISTICAL ANALYSIS

Line 107-108: Move sentences beginning "A p-value…" and "The results were…” to the end of the data analysis section.

Line 110 to 112: Use correct test names: Mann-Whitney U test, Wilcoxon signed-rank test. Also, the 'Kruskal-Wallis' is not an ANOVA.

Line 111-113: This is the first mention of any comparison of tendon characteristics between males and females and between right and left limbs. If these are secondary aims, they should be stated under the aims section in the introduction. What is the clinical relevance of this secondary analysis?

RESULTS

Line 135 to 148: round P-values to 3 decimal places. If < 0.0009 round to <0.001.

Line 136: what is "TA"? Be consistent in use of your pre-stated abbreviations. If referring to TA muscle, use TAM. Check throughout manuscript that abbreviations are being used consistently.

DISCUSSION

Line 155, 157: consider rewording "…defines a systematic classification of the TAT which has been confirmed with ultrasound examinations". The results did not quite demonstrate that the ultrasound findings 'confirmed' the cadaveric findings - there were some important differences with regard to Type IV and VI.

Paragraphs 2-3 (Lines 159-177): this description of pre-existing classification types would be better placed in the introduction as they clearly highlight the variation in tibialis anterior tendon types reported previously - this would further strengthen justification for the research aims.

Lines 180-181: change "…in the Arthornhurstook and Gaew Im studies, as well as in Brenner studies." To "…in the studies by Arthornhurstook and Gaew Im, as well as by Brenner."

Line 191-192: This sentence can be removed (already stated in introduction).

Paragraphs 7 & 8 (Lines 196 -212): these paragraphs seem quite random and out of place in this manuscript. Paragraph 7 presents a summary of the clinical signs and symptoms of a patient with a tibialis anterior rupture. Paragraph 8 presents details of surgical options for treating tibialis
anterior tendon injuries. Neither paragraph relates back to the purpose or importance of the findings of the current manuscript. Either link these paragraphs to the findings of this paper or remove them. There are some other important findings that could be discussed: Why were there morphological differences between men and women? Why might the cadaveric and ultrasound findings have differed with regards to Type IV an Type VI?

Line 213 - 214: The absence of a biomechanical analysis is not a weakness of the study, but rather a future direction - i.e. is anatomical variation in morphology and insertion reflected in variation in biomechanical function?

Line 218-219: consider rewording the final part of this sentence (...a new classification sis needed to enhance the results of future procedures on the TAT) which is slightly overstated. How about "...a new classification of the TAT would provide relevant anatomical knowledge which may help guide surgical procedures"

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