Reviewer's report

Title: Contributions of biarticular myogenic components to limitation of range of motion after immobilization of the rat knee joint

Version: 1
Date: 1 March 2014

Reviewer: Hiromu Ito

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Title: Contributions of biarticular myogenic components to limitation of range of motion after immobilization of the rat knee joint

To investigate the relationship between muscle contracture and the changes in cross-sectional area (CSA) of biarticular muscles after atrophy due to immobilization, the authors examined ROM changes and CSA after tenotomy of upper leg (UL) and lower leg (LL) muscles on rats with the knee immobilized by an external fixator. The authors found that the UL biarticular muscles contribute more than the LL muscles to knee contracture. This study contains several interesting and clinically worthy data regarding the contributions of biarticular muscles in the legs to the knee joint contracture. However, this manuscript has so many errors and misleading words and descriptions that make readers very much confusing. The overall data, construction of the presentation, wording and descriptions must be reconsidered throughout the entire manuscript, and the manuscript itself should be rewritten.

Major compulsory revisions:

1. As the reviewer pointed out above, the overall construction of the manuscript should be reconsidered. Other researchers would have very hard time to understand the results and discussions of the present manuscript. In addition, the manuscript must be checked by an experienced native English editor.

2. Table 3 shows interesting data. However, this table can be confusing because actual CSA is INCREASED despite of immobilization. To make this table straightforward, the reviewer would advise that this table be shown by the ratio relative to the control. Or the authors can show the change of each group in Fig. 6. In addition, the authors should be cautious in describing the results of CSA. For example, the authors described ‘the myofiber CSAs was significantly lower 16 weeks,,,’ in the results section of the abstract. This description is not true. This should be ‘the ratio of the myofiber CSAs relative to the control was significantly lower,,,’

3. In methods (p8, lines 3 and 5), the authors used ‘component’. Readers may not understand well this term because ‘contracture’ was used in the very similar meaning in other parts in the very same paragraph. Also the authors used ‘limitation’ in Table 1 but used ‘component’ in results section (p10, lines 14, 15 and 16) in the very similar or the same meaning. The same is true in Table 2, Fig.2 I, and results (p11, lines 2, 5, 8, 13). The term ‘restriction’ is also used in
the results (p11, lines 10 and 13) and Fig. 3. Is there any difference or meaning of using different terms?

4. Why did the authors need to discuss the difference between internal and external fixation? (p13, lines 15 -18). Please make this clear.

5. The authors discussed the weight and volume of muscles in the discussion (p14, lines 14 to 18) with no data. The authors should not discuss anything without showing their data, or the authors need to include relevant references.

6. The authors discussed lever arms of UL and LL muscles (p15, lines 5 to 12). The only reference is 33, but this is just for medial gastrocnemius muscle. Please add one or two references for hamstrings or on comparison of the two muscles.

7. The limitations of the study should be summarized in one paragraph.

8. The conclusion should not contain many suggestion or discussion as described (p18, lines 1 to 5).

Minor essential revisions:

1. The authors wrote ‘date’ in Tables 1 and 3. Are these ‘data’? Also, ‘time interval’ should be ‘time point’ under the reviewer’s understanding.

2. The authors used ‘upper leg’ for upper biarticular muscle and ‘lower leg’ for lower biarticular muscle. Is this term common or established? These terminology may be confusing.

3. In methods (p6, line 1 to 2), the authors described ‘a high-resolution micro-CT scanner was used to confirm knee immobilization. Is that so? Wasn’t CT scan used for measuring the ROM in immobilization?"

4. ‘U’ is missing at the beginning of the short title in line 2 of page 11.

5. The authors described ‘among all samples’ in results (p12, lines 6 and 13). However, the authors used only two samples in each group for morphological analysis (p5, lines 17 to 18). The word ‘all’ is seemingly an exaggeration.

**Level of interest:** An article of importance in its field

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.