Letter to the Editor


A R T I C L E  I N F O

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Transstibial prosthesis
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Dear Editor,

First we would like to congratulate the authors that after an almost long cease in the lower limb pistoning research attempted to improve the existing evaluation techniques; since the last research paper in this regard was published by Sanders et al. in 2006. Coming from both prosthetics and biomedical background, we felt to share our comments regarding some parts of this paper.

In the first place the maximum amount of pistoning in the abstract drew our attention. The authors have reported downward slippage amount of 151 mm for the fast-stop task and 19 mm for the step down task between the distal markers. This amount of pistoning is far from the value presented in other studies on the pistoning measurement (Grevsten and Erikson, 1975; Lilja et al., 1993; Narita et al., 1997; Tanner and Berke, 2001; Söderberg et al., 2003; Sanders et al., 2006). Even though it is considered the first study with dynamic tasks of fast stop and step down, still the vertical displacement cannot be as high as 151 mm. They also mentioned in Table 1 that the average stump length in ten subjects was about 148 ± 31 mm; it might be interpreted as if the stump had totally come off the socket during fast-stop task which is implausible in the prosthetics practice. Moreover, in another publication the authors themselves stated maximum 3D slippage of up to 16 mm for fast-stop task (Papaioannou et al., 2010).

In the methodology, the authors have mentioned PTB sockets for their subjects, but only stated that the amputee 2 used a vacuum system with silicon liner. Since the type of suspension system has great effect on the slippage among lower limb amputees (Narita et al., 1997; Tanner and Berke, 2001; Yigiter et al., 2002) we are worried about the comparisons made between ten subjects, specifically shown in Figs. 4 and 7. Moreover, in another publication the authors themselves stated maximum 3D slippage of up to 16 mm for fast-stop task (Papaioannou et al., 2010).

In this study some markers have been attached to the skin and socket at the level of the knee joint or above it both on the tibia and femur segments, according to Fig. 6. Having recently dealt with pistoning measurement, we would like to point out that the knee flexion and extension can bias the real amount of pistoning and should be eliminated. The proposed solution would be placing the markers on one segment, i.e. tibia.

In conclusion, some small points of correction are suggested. Fig. 1 denotes two X-ray cameras, but neither the figure legend nor the text mention the direction of imaging (AP/ML). Also, in a close look at the figure the femur appearance reveals that (a) and (c) do not demonstrate the same view of the prosthesis. The markers skMAnt and skDAnt locations are supposed to be the anterior and medial side of the stump, but in (a) they seem to be located on the lateral side (from the femur appearance). In addition, it seems that (a) and (b) also do not illustrate different views of same patient.

The reported amounts of vertical displacement for the markers soPLPos and skPLat in Fig. 4 do not correspond to the data given for the same marker points in Table 2. Also, the values on the vertical axis (Fig. 4) do not increase evenly.

Besides that Table 2 is supposed to demonstrate three-dimensional maximum, minimum, and average distance between selected skin and socket markers and the residual bone edge for patient 4 in fast-stop task, according to the table caption. However, rows 3 through 5 display data for all of the ten patients in step-down tasks.

In summary, the authors have claimed it to be a good and accurate method for the pistoning measurement, but it does not seem to be a practical technique that every prosthetist can perform in a prosthetics clinic.

Conflict of interest statement

The authors declare that there are no conflicts of interest.

References


A. Eshraghi*, H. Gholizadeh, N.A. Abu Osman
Department of Biomedical Engineering, Faculty of Engineering, University of Malaya, 50603 Kuala Lumpur, Malaysia
E-mail address: arezoo@um.edu.my (A. Eshraghi)

* Corresponding author. Tel.: +603 79676808, Cell: +6014 2275184; fax: +603 79674579.