P−51

New calibration method of centre of pressure of force platform

Akouetevi Aduayom-Ahego, Yoshihiro Ehara, Shota Inoue
Graduate School of Health and Welfare, Niigata University of Health and Welfare

【Introduction】

Kinetics and kinematics data are measured using force platforms in the gait analysis laboratory. Reducing errors related to the force platform when collecting data is necessary. Joint moments will be affected if there is error in the system. Valid results of the joint moments can only be obtained if the determination of the Centre of Pressure (COP) is accurate. To calibrate the force platforms, heavy devices have been used. However these devices might be difficult to move during the data collections. The purpose of the present study is to calibrate the location of the Centre of Pressure with commonly used force platforms in the gait laboratories.

【Materials and Methods】

The new calibration device is consisted of a bar of approximately 1m long and 35mm diameter fixed on the top of the wooden sandal. A metallic ball point of 20mm diameter was attached to the sole of the wooden sandal. Three markers set on the device then a male subject was asked to put one leg on the sandal and he was ordered to put his weight vertically on many places of the two force platforms (Fig. 1). A computational program was developed using Matlab to calculate the position of the centre of pressure before and after the calibration.

【Results】

Figures 2 and 3 show the position of COP_V and COP_f data before and after calibration of the two force platforms. Before the calibration, the maximum difference between COP_v and COP_f was 22.2 mm and 24.6mm respectively for the two force platforms. And after calibration the maximum difference was reduced to 2.5 mm and 2.7 mm respectively.

【Discussion】

The method highlighted in this study allows to calculate and correct the position of the COP data. This calibration method will reduce systematic error related to COP when collecting kinetics and kinematics data.

【Conclusion】

The method used in this study allows to reduce the maximum error from 24.6 mm to 2.7 mm. The device described in this paper is composed of a common wooden sandal especially used when wearing Japanese traditional wear kimono. It is then light weighted device less than 0.5 kg, portable and can be used to calibrate the gait analysis laboratory force platforms.

Fig. 1. Subject applying weight vertically on the force platform

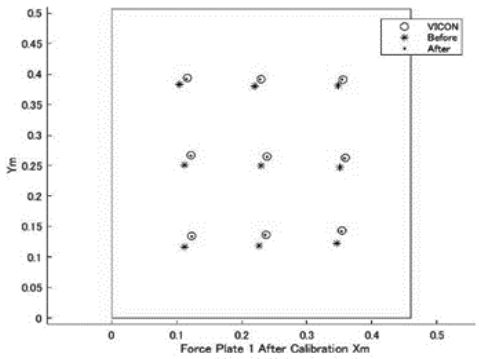

Fig. 2. Position of COP_v and COP_f data of the force plate 1 after calibration.
(COP_v=COP taken from VICON, COP_f= COP taken from the force platform)

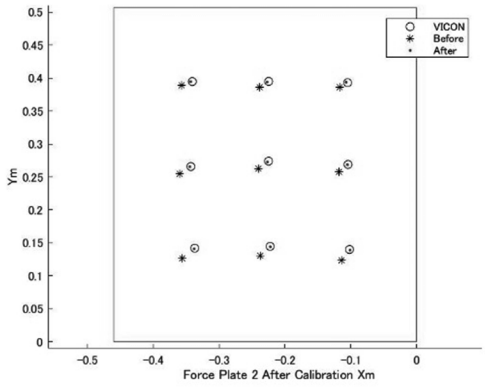

Fig. 3. Position of COP_v and COP_f data of the force plate 2 after calibration.
(COP_v=COP taken from VICON, COP_f= COP taken from the force platform)