Semi-automatic Scoring Method for Torticollis by Using Kinect

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Introduction

Purpose
To increase the ACCURACY and REPRODUCIBILITY of the scoring results for torticollis

Conventional Method
Conventionally, torticollis is scored manually (TWSTER[1], Tsui[2]). However, this manual operation results in inaccurate and non-reproducible scoring [3]. It also takes time, vague in scale, and quite complicated.

Method
In order to capture patients’ facial orientation in REAL TIME, we used Kinect to track patients’ faces.

Kinect (Microsoft Xbox full-body game controller) is a device that can simultaneously capture 2D color images and depth images. Depth images which Kinect captures consist of distance data of each pixel to the object. Therefore, Kinect is able to construct 3D image from the distance data.

Result/Conclusion

Result
We applied the system to 10 participants (7 males, and 3 females), and compared the results with those of conventional method. Manual scoring was conducted by a trained person. Comparing automatic scoring with manual scoring for three facial orientations, 80% of the automatically acquired angles were within ±7.5° range of the manually measured data. It indicates sufficient accuracy for Tsui scale that rates the orientation for each 15°.

Conclusion
We developed an automatic scoring system using Kinect. The results showed that the system can obtain posture data with sufficient accuracy to calculate Tsui score.

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