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Poster presentation

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Non invasive evaluation of SpineCor brace correction from surface topography

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Objective

Surface topography is used as a non invasive acquisition of the external trunk geometry of adolescent idiopathic scoliosis (AIS). The aim of this study is to investigate a surface evaluation approach to evaluate the three-dimensional correction by inferring the in-brace trunk surface of patients undergoing SpineCor brace treatment [1].

Study design

Inspeck 3D digitizers were used to acquire the external without-brace and with-brace trunk of fifteen patients. On both acquisitions, anatomical landmarks were identified. Using landmark based elastic registration, the in-brace surface is obtained by transforming the without-brace trunk into the with-brace trunk. To quantify the external trunk correction, indices of torso asymmetry are extracted from the without-brace and the in-brace surface. The external correction is then correlated to thoracic and vertebral rotations determined from three-dimensional reconstruction of the spine and rib cage from multiple X-ray images.

Results

Preliminary results have demonstrated that clinical indices measured on the in-brace trunk successfully quantify the three-dimensional correction induced by the SpineCor brace on the trunk surface.

Conclusion

The proposed approach is a first step in establishing reliable non invasive and radiation free follow up for brace treatment while providing a quantitative three-dimensional measure of the external correction.

References

1. Coillard C, Leroux MA, Badeaux J, Rivard CH: **SPINECOR: a new therapeutic approach for idiopathic scoliosis.** *Stud Health Technol Inform* 2002, **88**:215-217.