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doi:10.1016/j.rehab.2011.07.359

CO07-005-EN

3D surface topography (Biomod-L®) for scoliosis follow up in the growth period. Non interventional longitudinal study comparing Biomod-L® parameters progression and Cobb angle progression

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Keywords: Spine; Scoliosis; Surface topography; Moiré

Background.– The Cobb angle measured on full spine radiographs is the gold standard parameter for scoliosis follow up. However, cumulative X-rays increase the risk of future cancers. Our goal is to space out X-ray controls while performing a surface topography (ST) follow up with the Biomod-L® digital optical system.

Goal.– To assess sensitivity, false negatives and negative predictive value (NPV) of Biomod-L®, which are the conditions to secure this procedure. Specificity and positive predictive value are less important, since a false positive will only lead to ask for an X-ray control as usually done.

Patients and methods.– A non interventional prospective study of a series of patients included consecutively since April 2009 and up to 100 patients. Biomod-L® assessments were performed along with X-ray controls, which were scheduled according to the traditional pattern. Parameters variations from date to date were compared. Cobb angle progression was defined by an increase of 3° at least. ST progression was defined either by a hump progression greater or equal to 2°, or by the increase of two minor parameters: 1) surface curve angles progression greater or equal to 5°; 2) lateral listing progression greater or equal to 1°.

Preliminary results on 75 follow up periods (60 patients).– Sensitivity 90%, NPV 90%, false negative 3/75 (specificity 60%, VPP 59%).

Conclusion.– Our preliminary results are consistent with previous studies (Goldberg, Parent). Biomod-L® is sensitive to slight scoliosis progression and can be used to space out and trigger X-ray controls with a mild risk of false negative.

Further readings

Parent EC, et al. Identifying the best surface topography parameters for detecting idiopathic scoliosis curve progression. *Stud Health Technol Inform* 2010.Goldberg CJ, Kaliszer M, et al. Surface topography, Cobb angles, and cosmetic change in scoliosis. *Spine* 2001;26(4):E55-63.

doi:10.1016/j.rehab.2011.07.360

CO07-006-EN

Reproducibility of skin surface measurements of the back by BIOMOD-L®

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Keywords: Scoliosis; Optical measurements; Repeatability

Background.– Telemetry of the rachis is the gold standard used for the follow-up of scoliosis. But the repetition of radiography is hazardous for children. The use of optical measuring instruments of the surface of the back could limit X-ray exposure.

measurements of the back by an optical system Biomod-L in a population with scoliosis.

Patients and methods.– Forty-six patients with scoliosis were measured BIOMOD L. Measurements were carried out in three different positions twice by two different inspectors. The Student *t* test was used to analyze the differences between the three postures. Calculation of the coefficient of correlation collates (ICC) and of the standard error of measurement (ESM) was used for the acquisitions made by two operators but read by only one. The calculation of the ICC and the TEM was used for the acquisitions made by only one operator but read by two operators.

Results.– Reproducibility was good with excellent for the two readings by two operators of the same acquisition. The reproducibility was considered to be correct with good results for the unit of the studied parameters when acquisition was carried out by two different operators. The position influenced the studied parameters to a significant degree in the sagittal and transversal plan. The passage of the Pied position to perfusion (PP) with the position joined elbows and rolled shoulders (ENR) significantly raised the thoracic hump in the transverse plan.

Conclusion.– There is an interest to use two positions to have optimal results. Tool BIOMOD is reliable; the measured parameters are reproducible for intra and inter-operators.

doi:10.1016/j.rehab.2011.07.361

Ateliers

Version française

Échographie interventionnelle en pathologie locomotrice

L'échographie fait maintenant partie intégrante de l'arsenal diagnostique en pathologie locomotrice. Parallèlement, l'échographie interventionnelle s'est développé largement ces dernières années. Elle permet, en effet, d'allier la précision du geste par rapport aux infiltrations à l'insu à l'innocuité de l'imagerie ultra-sonore par rapport aux techniques utilisant les radiations ionisantes (radioscopie ou tomodensitométrie).

L'objectif de cet atelier est d'initier ou de parfaire la pratique en MPR des infiltrations échoguidées.

Responsables de l'atelier.– Dr Collado et Dr Rousseau.

Expert.– Dr B. Legoff, H. Collado, B. Rousseau, E. Soltner, L. Tortelier.

Matériel.– Esaote, Toshiba ou Sonosite.

Description de l'atelier.– Après une présentation générale de l'échographie interventionnelle, chaque participant pourra s'exercer à une infiltration échoguidée sur une pièce d'anatomie animale.

doi:10.1016/j.rehab.2011.07.362

Anatomie de surface

Grâce à l'échographie, de nombreuses structures anatomiques sont visualisées avec précision et ce, dans les conditions réelles (patient en consultation). Cela a permis de d'actualiser l'anatomie de surface ou palpatoire mal connue et apprise dans les livres d'anatomie « classiques ».

L'objectif de cet atelier est de revisiter en direct et de façon ludique, l'anatomie de surface via un contrôle échographique. Pour cela, le « jeu » consistera à repérer cliniquement un certain nombre de structures anatomiques (tendon, ligaments...) sur différentes régions anatomiques (épaule, genou, cheville...) puis de vérifier par l'échographie la situations exacte de cette structure.

Responsable de l'atelier.– Dr Collado, Dr Rousseau.

Experts.– H. Collado, B. Rousseau, C. Bresson, E. Soltner, B. Legoff, L. Tortelier.

Matériel.– Esaote.

doi:10.1016/j.rehab.2011.07.363