Experimental Anatomy

Vrije Universiteit Brussel

REPRODUCIBILITY OF 3D-CERVICAL KINEMATICS DURING ROTATIONAL HIGH VELOCITY THRUST IN VITRO

Cattrysse E[1], Gianola S. [2], Provyn S. [1], Scafolgieri S. [1], Van Roy P[1].
[1]Experimental Anatomy Department, Vrije Universiteit Brussel, Belgium.
[2]Clinical Epidemiology Unit, Orthopedic Institute Galeazzi, Milan, Italy
email: ecattrys@vub.ac.be www.vub.ac.be/EXAN

SUMMARY

The present study investigates the reproducibility of 3-dimensional segmental upper cervical kinematics of manual upper cervical high velocity thrust (HVT) manipulative techniques. The results indicate that manual rotational HVT on C1-C2 is poorly reproducible.

INTRODUCTION

Very few studies have examined the segmental kinematics during cervical spinal manipulation. Moreover, information about its reproducibility is sparse due to technical and ethical issues[1]. This study aimed to investigate the reproducibility of the kinematics of rotational High Velocity Thrust (HVT) manipulation of the upper cervical spine in-vitro [2].

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METHODS

HVT manipulation were investigate in twenty fresh human cervical specimens were studied by two manual therapists. Kinematics of C1-C2 and C0-C1 were examined during segmental rotational HVT (figure 1) with a Zebris CMS20 ultrasound-based tracking system.

The 3D aspects of the trust moment were analyzed by the range of the main axial rotation motion component and coupled flexion-extension and lateral bending components during HVT.

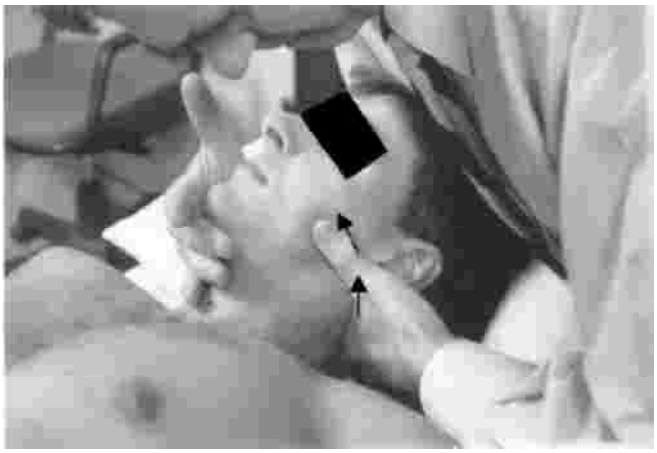
RESULTS

During rotational HVT of the C1-C2 segment the main axial rotation motion component and the the cross correlation between main axial rotation and coupled lateral bending show fair to moderate levels of intra-examiner correlation (0.35;0.64) and a moderate inter-examiner correlation in two out of four comparisons between examiners (0.52; 0.54).

CONCLUSION

Manual rotational HVT on C1-C2 shows to be poorly reproducible with only fair to moderate levels of intra-examiner and inter-examiner reliability in the main axial rotation component and the cross correlation between axial rotation and coupled lateral bending. The expertise of the manual therapist as well the inter-therapist variability in recruitment of motion components may play a major role conditioning the reproducibility of the HVT. To improve the reproducibility, new studies analyzing the overall 3D motion might including more examiners with different levels of expertise should be considered.

Figure 1: rotational high velocity thrust manipulation demonstrated in an in-vivo situation



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