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The radiographic method for measurement of axial vertebral rotation

Cerny Pavel[1, 3], **Marik Ivo**[2, 3] and **Pallova Iveta**[1]
[1]ORTOTIKA I.l.c., Prague, Czech Republic
[2]Ambulant Centre for Defects of Locomotor Apparatus I.l.c., Czech Republic
[3]West Bohemia University, Czech Republic

Assessing the extent of a rotation of a spinal segment on a transversal plane is difficult. The objective of this study is to present a new radiographic method for the assessment of vertebral rotation from an antero-posterior (AP) view of conventional X-rays which is sufficiently precise in comparison with radiographic methods presently used in clinical practice. The absolute size of the angle of vertebral rotation is measured on X-ray film. In order to verify the method, we have constructed a special device for vertebral fixation (*in vitro*) with the possibility to obtain X-ray films with a predefined rotation.

Results: Subsequently, the X-ray pictures of individual human vertebrae with predefined rotation values were radio-graphically measured and then compared with their actual axial rotation on the vertebral rotation device. All arithmetic averages correlate very closely with the actual values. The verification of axial vertebral rotation with the assistance of CT and MRI pictures and the evaluation of axial vertebral rotation by both the new radiographic method and with the Perdriolle method proved the satisfactory accuracy of our method.

Conclusion: The main advantage of the newly presented radiographic method is the uncomplicated measurement of vertebral rotation from AP projection of conventional X-ray pictures or from its digital and printed copies. The gold standard of the new radiographic method is the evaluation of axial rotation of vertebrae to 30° approximately and the shape of vertebral bodies without severe structural deformities. The new radiographic method seems to be suitable for use in clinical practice.

pavel@ortotika.cz

Biodegradable Mg alloy implant – Shifting the paradigm of conventional bone fixation devices

Hyung-Seop Han, **Yu-Chan Kim** and **Hyun-Kwang Seok**
Korea Institute of Science and Technology, Korea

Research on magnesium (Mg) and its alloys as alternative orthopedic materials has received increasing attention due to unique biodegradability, good biocompatibility and similar mechanical properties to natural bone. Over the past eight years, our research teams have created a road map to the next generation of magnesium implant materials with the addition of completely biocompatible elements. More than 20 patents have been filed and various *in vivo* and clinical studies were performed in collaboration with major hospitals in Korea to evaluate developed alloy's performance as the simple degradable bone screw, bone plate and bone graft. We would like to go even further and use the vast experience in the biodegradable research field to develop more advanced biocompatible implant material with higher strength, elongation and corrosion resistance. New material can be applied to more complex load bearing orthopedic implants such as spinal cage, bone plate, k-wire and scaffold.

hyuhan@kist.re.kr