

Abstract

Introduction

The joint dysfunction of the spine in the sense of functional blockade is connected with corresponding painful condition, reflex contraction of the surrounding muscles and restriction of mobility in the spinal segment. Joint block has its mechanical context, which need not be accompanied by a structural disturbance but it's affecting the biomechanical properties of the spine. Several theories exist how the joints become restricted. Scientific evidence highly supports the meniscoid entrapment theory.

Purposes

The aim of the study was to identify the meniscoids of the cervical spine using *in-vivo* MRI imaging and to determine their potential role in the development of functional joint blocks of the axial system (AS). Another objective was to find out how the articular blocks affect the rheological properties of the spine by the Transfer Vibration through the Spine (TVS) method.

Patient sample

The MRI study was conducted on a research file of 12 subjects - two anatomical preparations and ten *in vivo*. Two subjects were examined in TVS experiment.

Methodology

Two anatomical preparations were investigated on MRI to find the appropriate sequence for imaging of meniscoids, three subjects for identification of meniscoids *in vivo*. Seven subjects underwent initial investigation, manipulation of the spine and comparative investigation. Differences in the location and shape of the meniscoids were compared between the initial and the control examinations. Two subjects were examined by TVS method. After the initial examination, manipulation of the cervical spine and comparative examination were applied. The resulting data of the individual examinations was computerized and compared to each other.

Results

It has been verified, that the MRI method, in appropriate circumstances, enables the detection of changes in the size and shape of meniscoids *in vivo*. Functional

blockage of the joint may be associated with the entrapment of the meniscoid into the joint space. Using the TVS method, it has also been found that a functional articular blockade affects the rheological properties of the axial system, specifically reducing the damping capabilities of the particular spine segment.

Discussion

Based on the research can be assumed that several mechanisms are involved in the creation of functional joint blockages of the spine, including the meniscoid entrapment. By TVS examination method it is possible to evaluate the rheological properties of the cervical spine. This method is capable of detecting changes in damping capabilities of AS in the presence of functional intervertebral joints.

Conclusion

Using the MRI imaging documentation, we objectified the meniscoid entrapment theory. It is likely that there are several possible causes of joint blockage. Joint blocking affects the damping capabilities of the AS. TVS is a developing method and it will be necessary to verify our results and interpretations on a larger statistical set.