CERVICAL CORD NEURAPRAXIA: CLASSIFICATION, PATHOMECHANICS, MORBIDITY, AND MANAGEMENT GUIDELINES

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INTRODUCTION: One hundred ten cases of the transient neurological phenomenon, cervical cord neurapraxia (CCN), are presented.

METHOD: The authors established a classification system for CCN, developed a new computerized measurement technique for magnetic resonance (MR) imaging, investigated the relationship of the cervical cord to the canal, and analyzed clinical, x-ray, and MR data. One hundred nine males and one female were included in the study; the average age of the participants was 21 years (range 13-33 years). All episodes occurred during sports participation; 87% occurred while the patient was playing football. Follow-up review lasting an average of 3.3 years was available for 105 patients (95%).

RESULT: Narrowing of the sagittal diameter of the cervical canal in the adult spine was confirmed to be a causative factor. Cervical cord neurapraxia was not associated with permanent neurological injury and no permanent morbidity occurred in patients who returned to contact activities. Of the patients returning to contact activities, 35 (56%) experienced a recurrent episode. The risk of recurrence was increased with small spinal canal/vertebral body ratio (p<0.05), smaller disc-level canal diameter (p<0.05), and less space available for the cord (p<0.05). There was no correlation between either the classification of the CCN episode or the disease noted on MR imaging and x-ray films and the risk of recurrence.

CONCLUSION: The authors conclude that: 1) CCN is a transient neurological phenomenon and individuals with uncomplicated CCN may be permitted to return to their previous activity without an increased risk of permanent neurological injury; 2) congenital or degenerative narrowing of the sagittal diameter of the cervical canal is a causative factor; 3) the overall recurrence rate after return to play is 56%; and 4) the risk of recurrence is strongly and inversely correlated with sagittal canal diameter and it is useful in the prediction of future episodes of CCN (p<0.001). These data will enable the physician to counsel individuals regarding a predicted risk of recurrence on canal measurements.
FIG. Graphs developed using logistic regression analysis in which the risk of recurrence can be plotted as a function of the disc-level diameter measured on MR imaging (upper) and the SC/VB ratio calculated on the basis of x-ray films (lower). The construction of these plots is based on the result that increased risk of recurrence is inversely correlated with canal diameter. Future CCN patients can be counseled regarding their individual risk of recurrence based on the particular size of their spinal canal.