nitrous oxide gas canisters per week over the last 2-3 months. The neurological examination revealed severe sensory loss with a loss of fine touch in legs and hands with a sensibility border at C3/C4 and the complete loss of positioning and vibration sensation in both legs. She presented with sensory ataxia, a positive Romberg's test and an unstable broad gait. Blood tests revealed a low B12 level (74 pmol/L). A 1.5T Philips Ingenia MRI scan of the spinal cord was performed including sagittal and axial T2 weighted images.

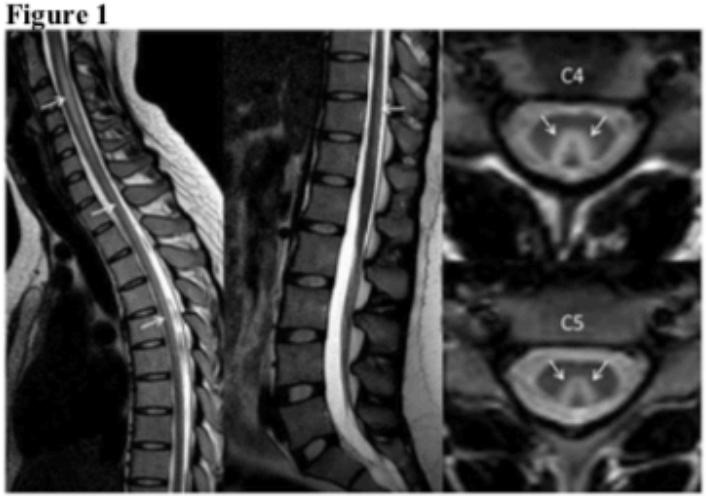
Result

MRI revealed bilateral longitudinal T2 hyperintensities along the entire length of the spinal cord except for the most caudal 1.6 cm. Axial images showed that the hyperintensities were in the posterior columns with possible involvement of the lateral columns in the cervical region.

Discussion & Conclusion

This case illustrates typical MRI findings consistent with subacute combined degeneration caused by nitrous oxide abuse. The T2 hyperintensities are symmetrical and seen in a typical inverted V-sign or "rabbit ears" localised primarily in the dorsal columns of the spinal cord which is consistent with symptoms of sensory loss. The changes are associated with swelling of the myelin sheaths and spongy vacuolation with possible axonal damage and gliosis. Changes are typically most pronounced in the cervical and upper thoracic regions of the spinal cord, which is also seen in this patient. Both MRI findings and clinical symptoms of subacute combined degeneration have been reported as being reversible in varying degrees depending on severity and duration of symptoms and abuse. Early diagnosis is therefore crucial to prevent lasting neurological deficits in this primarily young group of patients. This patient improved at first follow-up visit; long-term outcome remains to be seen.

Figure 1



5-P7

ADVANCED MRI IMAGING OF NERVE ROOTS IN LUMBAR RADICULOPATY DUE TO DICORADICULAR CONFLICT: DWI, DTI AND T2 MAPPING WITH CLINICAL AND NEUROPHISIOLOGICAL CORRELATIONS

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Keywords: lumbar nerve roots, DTI, DWI, T2 mapping

Introduction

To evaluate the lumbar nerve root alterations in patients with lumbar disc herniation sciatica using advanced multimodality MR sequences and the correlations with clinical and neurophysiological findings

Method

We prospectively evaluated 45 patients suffering from unilateral lumbar radiculopathy due to discoradicular conflict. Al patients underwent MRI examinations using a standard MRI protocol and additional advanced MRI sequences (DWI, DTI, and T2 mapping sequences). Relative metrics of ADC, FA, and T2 relaxation times were recorded placing ROIs at the pre-, foraminal, and post-foraminal level, either at the affected side and the contralateral side, used as control. Al patients were also submitted to electromyography testing, recording the spontaneous activity, voluntary activity, F wave amplitude and latency, and motor evoked potentials (MEP) amplitude and latency, either at the level of the tibialis anterior and the gastrocnemius. Clinical features (disease duration, pain, sensitivity, strength, osteotendinous reflexes) were also recorded.

Result

Among clinical features, we found a positive correlation of pain intensity with ADC values of the lumbar nerve roots. The presence of spontaneous activity was correlated with lower ADC values of the affected lumbar nerve root. F wave and MEP latency were correlated with decreased FA values at the foraminal level and increased values at the post-foraminal level. The same neurophysiological measures correlated positively with pre-foraminal T2 mapping values and negatively with post-foraminal T2 mapping values. Increased T2 mapping values at the foraminal level were correlated with disease duration.

Conclusion

Evaluation of lumbar nerve roots using advanced MRI sequences may provide useful clinical information in patients with lumbar radiculopathy, potentially indicating active inflammation/myelinic damage (DTI, T2 mapping) and axonal damage/chronicity (DWI).