Cervical radiculopathy: diagnostic aspects and non-surgical treatment

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Summary

This thesis deals with diagnostics aspects and non-surgical treatment options in recent onset cervical radiculopathy.

In chapter 1 we gave a short historical introduction on cervical radiculopathy and described the aims and outline of this thesis.

In chapter 2 we reviewed the existing literature on clinical diagnosis, ancillary investigations and therapeutic aspects. It was remarkable to find such a lack of knowledge on the value of often used diagnostic tools like magnetic resonance imaging (MRI) and needle electromyography (EMG). Neither did we find any evidence for the effectiveness of non-surgical pain relieving techniques.

To investigate the reliability of MRI we first assessed interobserver agreement on 78 patients with cervical radiculopathy, as described in chapter 3. The evaluation was done by two experienced neuroradiologists blinded to clinical data. The kappa score for interobserver variability of herniated discs was 0.59 (which can be interpreted as moderate agreement) and of spondylotic foramen stenosis it was 0.63 (substantial agreement). A kappa score of 0.67 (substantial agreement) was found for the presence of root compression. After disclosure of clinical information kappa scores increased slightly; for detection of herniated discs from 0.59 to 0.62, for spondylotic foramen stenosis from 0.63 to 0.66 and for root compression from 0.67 to 0.76 (all to be interpreted as substantial agreement).

In chapter 4 we report the results of our second MRI study, in which we relate the MRI results to clinical findings. In 73 percent of patients the clinically affected root was found to be compressed on MRI. In 45 percent of patients, MRI also showed asymptomatic root compression in addition to compression of the clinically affected root. MRIs were assessed as normal in 13-15 percent of cases and in 9-10 percent only asymptomatic roots were compressed. Herniated discs without spondylosis were more often responsible for root compressions only at the clinically affected level and spondylotic foraminal stenosis for multiple root compression including compression of clinically unaffected roots.
In **chapter 5** the results of our study on EMG are described. We performed a standardised needle electromyography in 5 muscles representing 4 myotomes (C5, C6, C7 and C8). The electrodiagnostic consultant was blinded to clinical and MRI data. We examined the occurrence of abnormal spontaneous activity (signs of denervation) and of neurogenic motor unit action potentials (signs of reinnervation). We found abnormalities in 39.2% of the 176 needle EMGs. Signs of reinnervation (29.5%) were more frequently seen than denervation (16.5%). These results led us to conclude that a standardised needle EMG as a routine examination in patients with cervical radiculopathy is not very useful.

In **chapter 6** we describe the results of our randomised clinical trial in which we compared treatment with a semi-hard collar and taking rest for three to six weeks; 12 twice weekly sessions of physiotherapy and home exercises for six weeks; or continuation of daily activities as much as possible without specific treatment (control group), in patient with recent onset cervical radiculopathy who were allowed to freely use analgetics. In the wait and see group arm pain diminished by 3 mm/week on the visual analogue scale (beta -3.1 mm, 95% CI -4.0 to -2.2) and by 19 mm in total over six weeks. Patients who were treated with cervical collar or physiotherapy achieved additional arm pain reduction (collar: beta -1.9 mm, 95% CI -3.3 to -0.5 mm, physiotherapy: beta -1.9, 95% CI -3.3 to -0.8), resulting in an extra pain reduction of 12 mm after six weeks compared with the control group. In the wait and see group, neck pain did not significantly decrease in the first six weeks (beta -0.9 mm, 95% CI -2.0 to 0.3). Treatment with the collar resulted in a weekly VAS-scale reduction of 2.8 mm (95% CI -4.2 to -1.3) amounting to 17 mm in six weeks, whereas physiotherapy with a weekly reduction of 2.4 mm (95% CI -3.9 to -0.8) resulted in a decrease of 14 mm after six weeks.
Compared with a wait and see policy the neck disability index showed a significant change with the use of cervical collar and rest (beta -0.9 mm, 95% CI -1.6 to -0.1) and a non-significant effect with physiotherapy and home exercises was found.

In conclusion, we advise a semi-hard cervical collar and rest for three to six weeks or physiotherapy accompanied by home exercises for six weeks, as it reduced neck and arm pain substantially as compared to a wait and see policy in the early phase of cervical radiculopathy.

The closing chapter 7 includes a general discussion which places the individual chapters into the context of available evidence and provides recommendations for further research.