Differences in PA movements between painful and less painful sides of the cervical spine

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Manual testing of posteroanterior (PA) movements has demonstrated clinical utility but lacks repeatability. Instrumented assessment is repeatable, but has not demonstrated clinical utility. To determine characteristics of PA movements that might be clinically relevant, unilateral cervical PAs were compared side-to-side on asymptomatic subjects when there was a difference in tenderness between sides. Ten locations from ten participants (six females and four males; mean age 37.2, range 21 to 50) were assessed. In addition to measures of stiffness and displacement considered in previous studies, force-displacement and stiffness-force curves were compared in three ways: simultaneous confidence bands (SCBs) of painful and less painful (control) sides; SCBs of differences between painful and control sides; and individual curves from painful sides were compared to simultaneous prediction bands (SPBs) of the controls. No differences were detected in the means, but painful sides had greater variation in displacement and stiffness than controls. SCBs demonstrated that the individual painful sides were significantly stiffer than their matched control side for forces above 11.5 N. None of the stiffness-force curves were fully contained by the control SPBs indicating each had significant differences from the control group. The largest differences found using both SCBs and SPBs were for forces between 15 and 18 N. Analysis of the pattern of stiffness rather than single measurements of stiffness or displacement used in previous studies may be necessary to detect clinically relevant differences. Possible relationships between patterns of stiffness and descriptors of PA movements such as endfeel and R1 will also be discussed.

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