Clinical Follow-Up of a New Implant System for Posterior Cervical Spine Instrumentation

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Purpose of Study: The use of rod-screw systems improved posterior instrumentation of the cervical spine significantly due to optimal screw position adapted to the individual anatomic situation. A new modular rod-screw implant system was developed with improved biomechanical properties and cannulated screw tips. The aim of this prospective clinical study was the clinical evaluation of the new implant system.

Methods Used: 38 consecutive patients with post-occipito-cervical or cervical instrumentation with the new implant system operated by one surgeon were evaluated prospectively after a minimum one year follow-up. Indications were instabilities due to rheumatoid arthritis in 10 patients, cervical spinal stenosis in 5 patients, implant failure with non-union in 4 patients, dens non-union in 4 patients, dens # in 3 patients, congenital malformations in 3 patients, cervical spine fractures with ankylosing spondylitis in 3 patients, rupture of the alar ligaments in 2 patients, locked fracture dislocations in 2 patients and iatrogenic instabilities in 2 patients. In 10 patients the occiput was included in the instrumentation, in 16 patients 8 pedicle screws and in 26 patients 52 transarticular screws C1/2 were used. The mean follow-up interval was 15.8 months (12-28), mean age at operation was 53.7 years (19-92). Evaluation included radiological, neurological and clinical follow-up.

Summary of Findings: No implant related complications were observed. One instrumentation-related complication was observed due to a broken k-wire tip during transarticular C1/2 instrumentation with cannulated screws and a 1.5 mm k-wire with threaded tip. After changing to non-threaded k-wires no more k-wire breakages occurred. No neurological or vascular complications were found related to pedicle screws as well as transarticular C1/2 screws. The malplacement rate of the pedicle screws was 11% (10 screws) and in all cases below 2 mm displacement without any neurological or vascular complications, no malplacement of transarticular C1/2 screws was found. Instrumentation with the new system was possible in all cases as planned preoperatively. During the follow-up period no non-union or implant failure was observed.

Relationship Between Findings and Existing Knowledge: This is the first report on the clinical evaluation of a new modular rod-screw implant system for posterior instrumentation of the cervical spine.

Overall Significance of Findings: This study showed that posterior instrumentation of the cervical spine using the new neon occipito-cervical system is versatile and has proven to be both safe and efficient.

Keywords:

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