**Presentation #32 P**

**Minimum Five-Year Follow-up Results for Occipitocervical Fusion Using the Screw-Rod System in Craniocervical Instability**

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**Introduction:** Occipitocervical fusion surgery effectively treats severe neck pain and myelopathy from craniocervical instability and spinal cord compression. There has been no long term study with a consecutive series of patients treated by occipitocervical (OC) fusion using pedicle screws and rods. The purpose of this study was to evaluate the clinical outcome of patients who had undergone OC fusion using pedicle screws and rods over a minimum 5-year follow-up.

**Materials and Methods:** Twenty-seven consecutive patients with OC disorders treated underwent posterior OC fusion using pedicle screws and rods over a minimum 5-year follow-up. The Modified McCormick scale to grade a patient’s functional status, and the Japanese Orthopaedic Association (JOA) scoring system were used to evaluate preoperative and postoperative neurological function. We assessed fusion by both direct and indirect evidence; bony trabeculae at the graft-recipient interface on lateral cervical radiographs and sagittal CT reconstruction was considered direct evidence of union. The implant-related complications included pullout of screws, rod breakage, plate breakage, screw breakage, screw loosening, and problems from sublaminar wiring.

**Results:** The mean follow-up period was 7.2 years (5-14 years). There were 10 men and 17 women with an average age of 52.2 years (3-78 years). JOA scores were 8.1 ± 3.8 before surgery and 11.7 ± 3.7 at the final follow-up. The recovery rate calculated from the JOA scores was 42.0 ± 30.0%. Functional status did improve at least 1 grade according to the modified McCormick scale in 18 patients (66.7%). There was no deterioration at the final follow-up.

**Conclusions:** Complications such as pseudoarthrosis still occur following occipitocervical fusion surgery in spite of advances and refinements of spinal implants. In the present study, 6 of 8 cases with implant failure occurred 12 or more months after surgery. Furthermore, 4 implant failures occurred 24 or more months after surgery, and one case did not have rod breakage until 5 years after surgery. This is the first report showing the mean rate of delayed failure. Sufficient bone grafting, proper decortication of the bone bed, using thicker and high stiffness rods, and ultra-high molecular weight polyethylene tape as a fixation or reinforcement of implant may help prevent implant failure.
a fixation or reinforcement of implant may help prevent implant failure.

thicker and high stiffness rods may cause delayed failure. Sufficient bone grafting, proper decortication of the bone bed, using autograft/mixing autograft with cancellous bone, and radiographic evidence of fusion at the 2-year follow-up, seem to be factors that would reduce the risk of implant failure in patients with a high incidence of implant failures.

4 implant failures occurred 24 or more months after surgery. This is the first report showing the mean rate of implant failure. Six of 8 cases with implant failure occurred 12 or more months after surgery. Furthermore, 10 of 16 cases with implant failure occurred 12 or more months after surgery. This is the first report showing the mean rate of implant failure.

In the present study, fusion surgery in spite of advances and refinements of spinal implants. In the present study, fusion surgery in spite of advances and refinements of spinal implants. In the present study, fusion surgery in spite of advances and refinements of spinal implants. In the present study, fusion surgery in spite of advances and refinements of spinal implants.

Conclusions:
The modified McCormick scale in 18 patients (66.7%). There was no deterioration at the follow-up. The JOA scores was 42.0 ± 30.0%. Functional status did improve at least 1 grade according to the Modified McCormick scale in 18 patients (66.7%). There was no deterioration at the follow-up.

Results for Occipitocervical Fusion Using the Screw System in Craniocervical Instability

Materials and Methods:
The minimum follow-up period was 7.2 years (5–14 years). There were 10 men and 7 women with an average age of 52.2 years (36–71 years).

Complications such as pseudoarthrosis still occurred following occipitocervical fusion surgery. Complications such as pseudoarthrosis still occurred following occipitocervical fusion surgery. Complications such as pseudoarthrosis still occurred following occipitocervical fusion surgery. Complications such as pseudoarthrosis still occurred following occipitocervical fusion surgery. Complications such as pseudoarthrosis still occurred following occipitocervical fusion surgery.

Screw-related complications included pullout of screws, rod breakage, plate breakage, and loss of rod purchase. Screw-related complications included pullout of screws, rod breakage, plate breakage, and loss of rod purchase. Screw-related complications included pullout of screws, rod breakage, plate breakage, and loss of rod purchase.

The Modified McCormick scale to grade a patient’s functional status, a recipient interface on lateral cephalometric radiographs and sagittal CT reconstruction was considered direct evidence of union. The Modified McCormick scale to grade a patient’s functional status, a recipient interface on lateral cephalometric radiographs and sagittal CT reconstruction was considered direct evidence of union. The Modified McCormick scale to grade a patient’s functional status, a recipient interface on lateral cephalometric radiographs and sagittal CT reconstruction was considered direct evidence of union.

Japanese Orthopaedic Association (JOA) scoring system were used to evaluate the fusion status. Japanese Orthopaedic Association (JOA) scoring system were used to evaluate the fusion status. Japanese Orthopaedic Association (JOA) scoring system were used to evaluate the fusion status.

See Disclosure Index pages 40–88.