OCCIPITAL CONDYLE SCREWS AS FIXATION POINTS FOR CRANIOCERVICAL INSTRUMENTATION. CADAVERIC FEASIBILITY, BIOMECHANICAL ANALYSIS, AND CLINICAL SERIES

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OBJECTIVE: To present the occipital condyle screw as a viable option for occipito-cervical (OC) stabilization using polyaxial screw-rod construct.

BACKGROUND/RATIONALE: The suboccipital plate is the current standard treatment of occipito-cervical instability. To overcome its disadvantages, the condyle screw was developed as the sole cranial fixation point in OC fusion.

METHOD: The feasibility of the placement of an occipital condyle screw was determined in cadavers. Biomechanical studies were done after placing the condyle screw. The clinical implementation was carried in a series of 8 patients.

RESULTS: The cadaveric study demonstrated that the condylar entry point was 4 to 5mm lateral to the foramen magnum, and 1 to 2mm rostral to the atlantooccipital joint. The mean medial angulation was 17 degrees. The maximal superior screw angulation was 5 degrees. The mean screw length for bicortical purchase was 22mm. Biomechanical testing revealed that the decreased range of motion with the condylar screw construct was comparable with the standard occipital plate and rod system. The 8 patient clinical series had a 100% OC fusion rate without complications.

CONCLUSION: Condyle screws can safely be placed and are biomechanically equivalent to the occipital plate. Although technically challenging, it allows for a larger exposed surface area for OC fusion to occur. OC junction fixation using polyaxial occipital condyle screws is feasible and can be considered a salvage technique or when other fixation techniques are not available.