Occipital condyle to cervical spine screw and rod fixation


Numerous conditions affect the occipitocervical junction, requiring treatment with occipitocervical fixation. In this paper, the authors present their technique of craniocephalic fusion, requiring treatment with occipitocervical fixation. Our manuscript was already published by our team.3 Our manuscript was submitted in March 6, 2008, and accepted for publication on March 6, 2009. Moreover, we have used our technique with success, and our first clinical series has already been published.1

In their approach, the occipital condyle entry point is usually lateral to the condylar canal (containing the occipital emissary vein) at the lateral edge of the condylar fossa. In our technique, the condylar entry point corresponds to the midcondylar area, 4 to 5 mm lateral to the foramen magnum on the axial plane and 1 to 2 mm rostral to the atlantooccipital joint.4 In the technique of Frankel et al., caudal-cranial angulation is determined by placing the hand drill in the pilot hole with its shaft tangential to and abutting the skull base. Depending on condylar, skull base, and hypoglossal canal anatomy, the overall trajectory of occipital condyle screws is usually 10° cranial or caudal to the horizontal plane.

In our technique, the maximal superior screw angulation in the axial plane was 5° (limited by the angulation of the occipital bone). Frankel et al. used bilateral 3.5-mm-diameter, 20- to 30-mm-long, medially convergent occipital condyle screws, noting that they believe these screws should be placed at an angle preferably 20°–33° from the sagittal plane. In our technique, significant flexibility was found in terms of the screw angulation relative to the axial plane that would allow good bone purchase. Screw medialization ranged from 12° to 22° (mean 17°). We safely used 30- to 32-mm-length screws with 20 to 24 mm of bicortical condylar purchase, which may decrease complications related to unicortical screw purchase. Approximately 12 mm of the unthreaded portion of the screw remained superficial to the posterior cortex of the condyle, allowing the polyaxial portion of the screw to lie above the posterior arch of C-1 in order to avoid compression of the vertebral artery by the rods.5

We concur with the authors that it appears that anatomical reference points may be sufficiently reliable to guide screw placement. However, the use of fluoroscopy/image guidance and intraoperative electromyographic nerve monitoring may be necessary, especially during the early phases of clinical trials, to ensure safe screw placement.

This novel transcondylar screw placement is still in evolution, and we hope that others will work closely in collegiality to enhance its potential development in the future so that we can include this in our armamentarium when dealing with complex cases requiring occipital cervical fusion.

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Disclosure

Dr. Uribe reports a consultant relationship with NuVasive.
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RESPONSE: No response was received from the authors of the original article.

Please include this information when citing this paper: published online July 18, 2014; DOI: 10.3171/2011.9.SPINE10327. ©AANS, 2014