

## Condylar Screw Fixation in Occipitocervical Fusions: a Single Institution Experience of 75 Cases

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#### Introduction

Condylar screws have been introduced as a rescue technique for occipitocervical fusions (OC), whenever a craniectomy limits the available fixation points on the occipital squama. We present our clinical experience of 75 cases of OC fusions utilizing occipital condylar screws, the largest series to date.

### Methods

Between September 2012 and April 2014, 75 patients requiring OC fusion were operated on using occipital condylar screws, in addition to C1 and C2 screws. 57 were female, 13 pediatrics, 16 redos of former fusions, 44 had associate Chiari decompressive surgery. SSEP, EMG (IX-XII), and screw stimulation were used. We relied on anatomical and fluoroscopic landmarks, and not on neuronavigation. The execution of this technique was streamlined by a number of surgical nuances, which among the others included: screw insertion in flexed position, and an original dissection technique of the condylar fossa. 53 patients had a 6-month and 24 a 12-month follow-up.

# Results

Only one direct complication from condylar screw insertion occurred, and was linked to a neuromonitoring mishap. It resulted in a mild hypoglossal deficit, which became barely visible 12 months later at the neurological exam, without any noticeable permanent effect on function. The fusion rate at the 6 and 12-month follow-up was 100%. The following clinical information emerged at the 6-12 month follow-up: 1.Overall condition: improved 90% (greatly improved 65%). 2.Local discomfort from hardware: severe 9%, moderate 9%, mild 32%, and absent 50%. 3.Likelihood of choosing again this surgery: no 3%, not sure 6%, and yes 91%.

### Conclusions

75 patients requiring OC fusion were operated on using occipital condylar screws, the largest series reported to date. The original surgical nuances, low incidence of complications, good fusion rate, and positive clinical feedback at follow-up, led us to change our perception of the condylar screws, from rescue technique, to our current standard for OC fusion.

# Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of condylar screw fixation; 2) Discuss in small groups the nuances of the surgical technique.

### References

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Intraoperative photograph showing: suboccipital craniectomy, linear durorraphy, C1 laminotomy, C2 spinous process, C0 condylar screws, C1 lateral mass screws, and C2 pedicle screws.

Figure 2



Intraoperative photograph (from a different case) after adding 3.5cm long nickel-chromium bars.

### Figure 3



Magnified view and details from the same surgical field presented in Figure 2.





Same surgical field as in Figures 2 and 3, after deposition of the bone matrix over the hardware.

Figure 5



3DCT image of a mature construct at the 6-month followup. The hardware and the bone fusion have different color codings.