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Three Dimensional Quantification of Post-Surgical Condylar Displacement

Thomas M. Graber Award of Special Merit
PURPOSE OF OUR STUDY

To measure, in **three dimensions**, translation and rotation movements of the condyle after orthognathic surgery.
MATERIALS

- 17 Consecutive Patients [10M, 7F]
- Skeletal Class II Or Class III Malocclusion
- Pre-surgical Orthodontic Treatment + Bi-maxillary Surgery (Same Oral Surgeon)
- Maxillary Le Fort I Osteotomy & BSSO
- Rigid Fixation (Plates)
- Full head CBCT scans, pre surgery and 2 weeks after surgery
METHOD

1) Segment the Region of Interest: condyles and fossae, pre and post surgical
2) Export as separate surfaces
3) Superimpose on Glenoid Fossa
4) Measure condylar displacement:
   Translation (mm): x,y,z
   Rotation (degrees): x,y,z
1. Segment the Region of Interest
2. Export as Separate Surfaces
3. Superimpose on Glenoid Fossae
4. Measure Condylar Displacement from PreSurgical (Blue) to Post Surgical (Red)
RESULTS

AVERAGE CONDYLAR TRANSLATION (MM)
RESULTS

AVERAGE CONDYLAR ROTATION (°)

-0.27
-0.30
0.63

-0.30

0.63

0.307
0.277

0.063

x
y
z
What is this kind of movement due to?
What is this kind of movement due to?
What is this kind of movement due to?
DISCUSSION

MEDIAL AND SUPERIOR MOVEMENT

Why didn’t we find these kinds of movements?
CASE PRESENTATION

Blue = before surgery
Red = after surgery
CONCLUSIONS

1. A method to measure Condylar Displacement in 3 planes of space was established, both for rotation and translation.

2. Posterior displacement
3. Anteroposterior Rotation
4. MedioLateral Rotation
5. Surgical stability
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