

INTRODUCCION

Obstructive Sleep Apnea (OSA) is a prevalent disease, and alternative treatments are necessary specially in patients with intolerance to CPAP. The present study introduces the BIRD Approach, an innovative method for OSA patients. **Bilateral Internal Ramus Distraction (BIRD) of the mandible** is a slow, progressive, and stable procedure to advance the mandibular bone. The objective of this study was to investigate the effectiveness of this approach in curing OSA. An interventional (surgical) one-arm trial was conducted on OSA patients, evaluating them before and at 12/24/48 months after BIRD. Pre/postoperative polysomnography and 3D scans were performed to assess the patients. The predictor variables included the amount of skeletal advancement, percentage of upper airway volume increase, and postoperative value of mandibular occlusal plane. The main outcome variables measured were the changes in the apnea-hypopnea index (AHI), oxygen desaturation index (ODI), and percentage of time with saturation under 90% (TC90).

METHOD

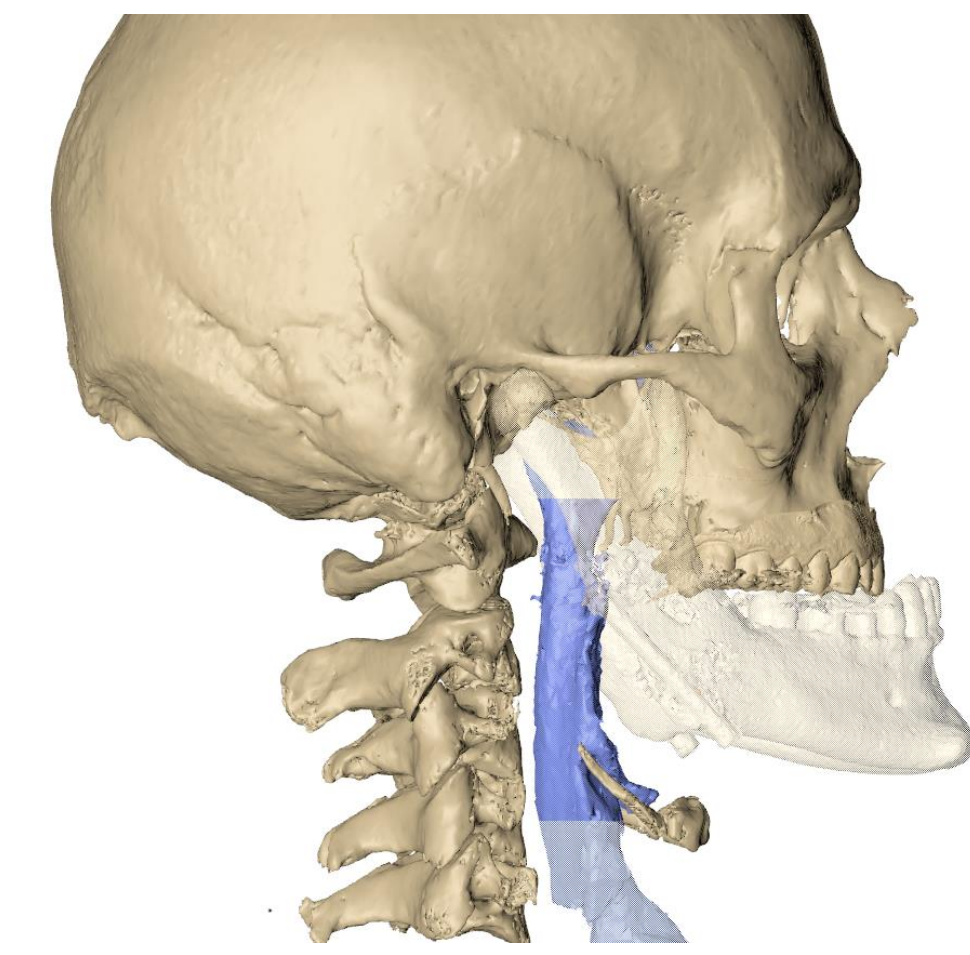
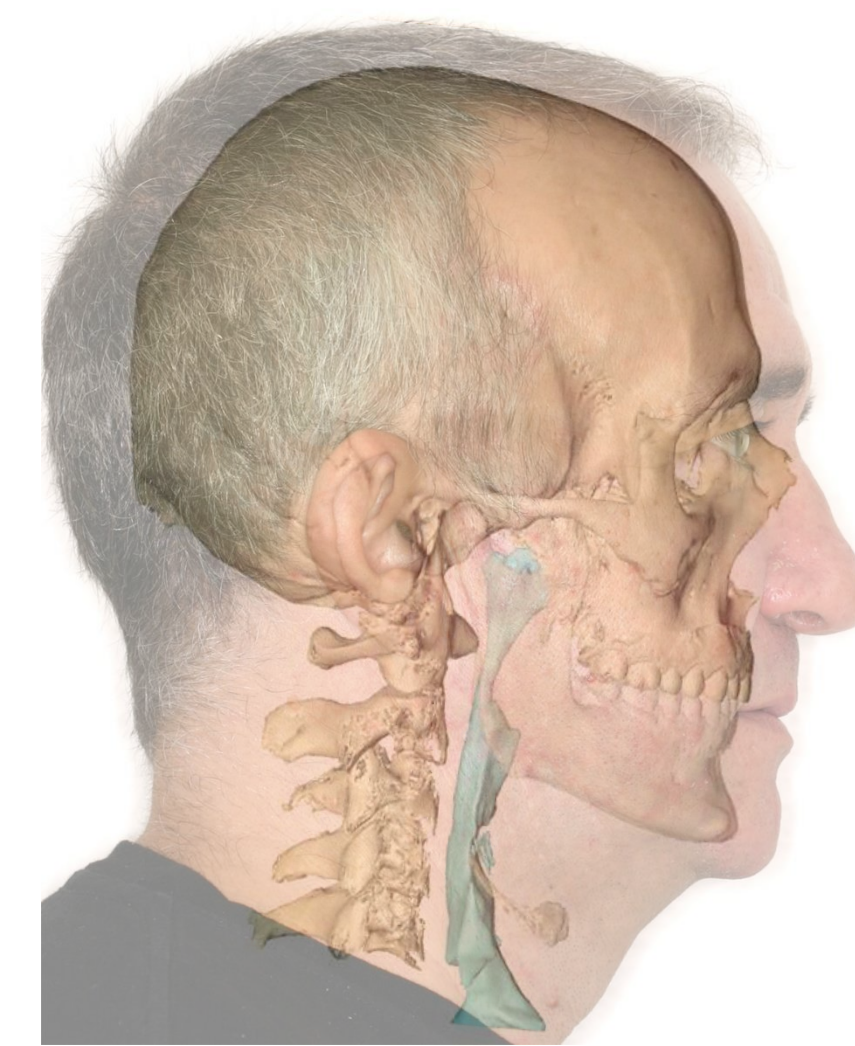
Eighty subjects, with a mean age of 39.9 ± 11.3 years and 69.5% being male, were included in the study and **followed up for a period of 48 months**. All patients underwent pre- and postoperative polysomnography and three-dimensional scans for evaluation. The predictor variables considered in this study were the amount of skeletal advancement, percentage of upper airway volume increase, and postoperative value of mandibular occlusal plane. The primary outcome variables assessed were changes in the apnea-hypopnea index (AHI), oxygen desaturation index (ODI), and percentage of time with saturation under 90% (TC90).

RESULTS

Following the BIRD procedure, significant improvements were observed in the OSA patients. The preoperative AHI was 51.9 ± 22.1 per hour, while EES was 15.4 ± 4.1 . After 12 months, AHI decreased to 3.9 ± 6.6 per hour ($P < 0.001$), and **cure rate of 90.6%** ($P < 0.001$). Three-dimensional scans revealed a substantial increase in upper airway volume by $201.4% \pm 46.5%$ ($P < 0.001$).

CONCLUSIONS

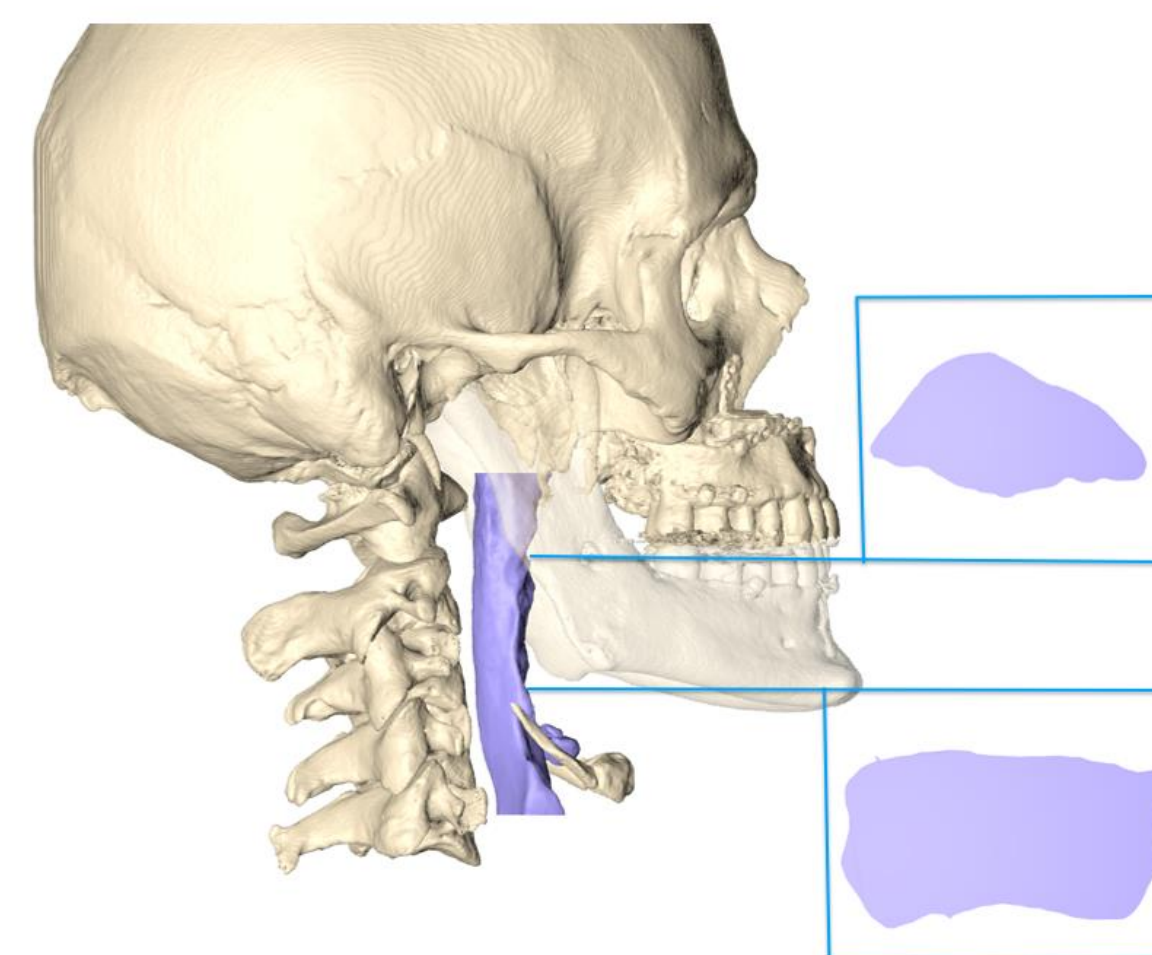
BIRD appeared to be a highly effective and safe surgical approach. The weekly titration of mandibular advancement using respiratory polygraphy allows for better monitoring of healing and customization of skeletal advancement, ultimately enhancing the aesthetic outcome. The BIRD Approach demonstrates promising potential as a tailored treatment strategy for OSA patients.



Lower Incisor Advancement	AHI
0 mm	97.5
3 mm	97
6 mm	69
9 mm	47
12 mm	24.1
15 mm	12.1

Tailoring Mandibular Advancement

3D CBCT reconstruction (before surgery). 3D during mandibular advancement (BIRD).



3D after maxillary advancement. The final Upper Airway Volume is more than twice the initial volume $22.323,1\text{mm}^3$ (initial $8.001,1\text{mm}^3$). Choke points surfaces have also doubled.



Initial AHI 45/h

Final AHI 0,5/h

REFERENCES

Rubio-Bueno P, Hernando G, Capote-Moreno A, Landete P, Wix R, Peñaloza A, Rocio E, Zamora E, Soriano JB, Naval-Gías L. A one-arm surgical trial of obstructive sleep apnea (OSA) patients before and 12 months after Bilateral Internal Ramus Distraction of the mandible (BIRD). *Sleep Med.*80:57-65. 2021

Verde L, Capote A, Wix R, Brabyn, R Campo F, Rubio-Bueno P. Improved quality of life after mandibular advancement by bilateral internal ramus distraction (BIRD). *J Oral Maxillofac Surg:* 1-12, 2023