

## Can a surgery-first orthognathic approach reduce the total treatment time?

Jong Woo Choi, MD, PhD, Woo Shik Jeong, MD, Kyung S Koh, MD, PhD

**Disclosures/Financial Support:** None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

**INTRODUCTION:** A traditional orthognathic approach requires presurgical orthodontic treatment for an average of approximately 17 months,<sup>1</sup> followed by surgery and postsurgical orthodontic treatment for approximately 6–12 months. Therefore, the total treatment time for the conventional orthognathic approach takes approximately 18–36 months.<sup>2–4</sup> Because traditional orthognathic surgery requires 2–3 years to complete, it is a rarely adopted procedure. Therefore, shortening the total treatment time would be extremely beneficial for patients. Although presurgical orthodontic treatment has been approved as an inevitable process for stable orthognathic correction before surgery, recent advances in the application of mini-screws and presurgical simulational orthodontic management skills on a dental model show that it is possible to perform a surgery-first orthognathic approach without presurgical orthodontic treatment.<sup>5</sup>

**MATERIALS AND METHODS:** We assessed 45 consecutive Asian patients with skeletal class III dentofacial deformities with surgery-first orthognathic surgery compared to 52 patients with conventional two-jaw orthognathic surgery. Using cephalometric landmark data for the patients with a surgery-first approach, we analyzed postoperative changes in vertical and horizontal facial, denture, and soft tissue patterns. Assuming that tooth extraction is a factor that affects the total treatment time, both groups were divided into two subgroups.

**RESULTS:** The treatment duration of the surgery-first group was significantly less than that of the orthodontics-first group. Overall, the analysis revealed that the total treatment time period in the surgery-first orthognathic approach averaged 14.6 months compared to 22.0 months of treatment in an orthodontic-first orthognathic approach. Among the surgery-first cases without tooth extraction, the average treatment interval was only 13.6 months versus 24.8 months for the six that required tooth extraction ( $p < 0.001$ ). In contrast, the average treatment period of traditional orthodontics-first cases without tooth extraction was roughly comparable to the nine cases that required tooth extraction (21.7 months vs. 21.6 months, respectively). The difference between immediate postoperative and preoperative, postoperative and immediate postoperative cephalometric data revealed factors that have correlation with total treatment duration.

**CONCLUSION:** Surgery-first orthognathic surgery can dramatically shorten the total treatment time with no major complications. By analyzing the cephalometric landmark data we identified several possible factors that have an effect on the total treatment time.

## REFERENCES:

1. Luther F, Morris DO, Hart C: Orthodontic preparation for orthognathic surgery: how long does it take and why? A retrospective study. *Br J Oral Maxillofac Surg* 41:401–406, 2003.
2. Van Sickels JE, Loftus MJ, Weiss WW, Jr: Orthognathic surgery: a team approach. *Bull Phila Cty Dent Soc.* 45:8-9, 1979.
3. Slavnic S, Marcusson A: Duration of orthodontic treatment in conjunction with orthognathic surgery. *Swed Dent J.* 34:159-166, 2010.
4. Dowling PA, Espeland L, Krogstad O, Stenvik A, Kelly A: Duration of orthodontic treatment involving orthognathic surgery. *Int J Adult Orthodon Orthognath Surg.* 14:146-152, 1999.
5. Choi JW, Lee JY, Yang SJ, Koh KS: The reliability of a surgery-first orthognathic approach without presurgical orthodontic treatment for skeletal class III dentofacial deformity. *Ann Plast Surg.* 74:333-341, 2015.