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Implantation before orthognathic surgery in a case of facial asymmetry with bite collapse – Case report

KEYWORDS
Implantation;
Facial asymmetry;
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In the cases that require interdisciplinary treatment, prosthetic reconstruction is usually the last step of the rehabilitation.[1] However, free-end edentulism with insufficient occlusal support may cause unstable occlusion after orthognathic surgery (OGS), therefore implantation at appropriate positions before OGS can help to determine the position of the proximal segment during surgery.[2]

This 29-year-old female patient wished to restore her left side chewing function and to improve her facial appearance. She had facial asymmetry with the mandible deviated to the right side, maxillary arch left-side-down and mandibular arch left-side-up occlusal plane canting (Fig. 1A). Maxillary anterior teeth were tipped towards the right side and mandibular dental midline deviated towards the right side for approximately 4 mm, deep overbite from the right maxillary central incisor to the left maxillary first premolar (Fig. 1B). There was a minor crowding on both maxillary and mandibular arches, with Class II molar and canine relations (Fig. 1C, D and E). The left mandibular molars were missing with opposing arch teeth elongation that jeopardized spaces for prosthetic reconstruction (Fig. 1F). A prominent difference in bilateral condylar height was noted from the panoramic radiography, with the right condylar head mild flattening without any symptoms (Fig. 1G). Treatment objectives were to relieve crowding, create space for implant prosthesis, and correct facial asymmetry with OGS.

Two weeks after full mouth fixed appliance bonding, temporary anchorage devices (TADs) were placed between the left lateral incisor and canine of both arches for regional intrusion to open the deep overbite. A TAD was also placed on the left mandibular edentulous area, and a single tube was bonded onto the built-up composite resin. It helped to relieve crowding, improve arch form symmetry, and intrude mandibular anterior teeth. Improvement of canting and deep bite could be seen after four months of treatment (Fig. 1H, I, J and K). Wires were progressively changed to rectangular stainless wire, at the eleventh month, two more TADs were placed on the buccal and palatal sides of the left maxillary molars for posterior intrusion,[3] meanwhile, anterior TADs were retrieved. At the eighteenth month, decompensation was almost done, patient received implantation of the left mandibular first and second molars, and the soft tissue healing was fine after 3-month follow-up (Figs. 1L and M). Provisional crowns were delivered, and loading began 5 months after implantation, patient underwent OGS after 30 months of orthodontic treatment (Figs. 1N, O, P, Q, R and S). Maxillary LeFort I left side vertical impaction, mandibular bilateral sagittal split osteotomy with the left side shift, and genioplasty were performed. Post-surgical occlusion was very stable, fixed appliances were removed 4 months after intermaxillary fixation, and final prosthesis were fabricated (Figs. 1T, U, V, W, X and Y). The total treatment period was 36 months. Panoramic radiography showed good root parallelism and stable peri-implant bone height (Fig. 1Z). Comparison of initial and final posterior-anterior cephalometry showed good skeletal symmetry after OGS (Fig. 1AA).

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Figure 1 Clinical extraoral and intraoral photographs and radiographs of our case. (A) Initial extraoral photographs showing facial asymmetry with the mandible deviated to the right side and occlusal plane canting. (B, C, D, E and F) Initial intraoral photographs exhibiting the left posterior teeth bite collapse. (G) Initial panoramic radiograph. (H, I, J and K) Intraoral photographs showing improvement of occlusal plane canting after intrusion with temporary anchorage devices at the fourth month of treatment. (L and M) The left lower first and second molar implantation was performed and ready for provisional crowns placement after 22 months of treatment. (N) Pre-surgical extraoral photographs. (O, P, Q, R and S) Pre-surgical intraoral photographs. (T) Final extraoral photographs after 36 months of treatment. (U, V, W, X and Y) Final intraoral photographs showing bilateral solid Class I canine and molar relations with ideal overjet and overbite. (Z) Final panoramic radiograph demonstrating good root parallelism and stable peri-implant bone height. (AA) Initial and final posterior-anterior cephalometric tracings showing good skeletal symmetry after orthognathic surgery.

Maxillary unilateral posterior TADs could be beneficial for facial asymmetry cases in limiting surgery to one jaw.[3] In our case, canting was severe, thus the left maxillary quadrant was intruded for pre-surgical decompensation and further to create space for prosthesis and to reduce the amount of bone cut. Implantation before OGS not only provides adequate occlusal support after surgery,[2] but also can avoid the impairment of osseointegration of dental implants possibly caused by regional acceleratory phenomenon, if implantation is planned to be carried out within a year after OGS.[4,5]

Declaration of competing interest

The authors declare no conflicts of interest relevant to this article.

References

1. Lee MS, Ho CL. Full mouth rehabilitation with interdisciplinary treatment — a case report. *J Fam Dent* 2014;8:25—36.
2. Ohba S, Nakatani Y, Kawasaki T, et al. Oral rehabilitation with orthognathic surgery after dental implant placement for Class III malocclusion with skeletal asymmetry and posterior bite collapse. *Implant Dent* 2015;24:487—90.
3. Ho CL, Chiang CP, Hu KY, Wong HF. Correction of facial asymmetry and posterior bite collapse by orthodontic treatment combined with temporary anchorage devices and orthognathic surgery: case report. *J Dent Sci* 2020;15:104—6.
4. Kim JW, Kim HY, Kim SY, Kim SJ. Impaired osseointegration of dental implants associated with orthognathic surgery: possible regional acceleratory phenomenon. *Clin Implant Dent Relat Res* 2019;21:531—7.
5. Kim JW, Lee H, Lim HK, et al. Orthognathic surgery deteriorates the osseointegration of dental implants: a propensity-matched multicentre cohort study. *J Oral Rehabil* 2018;45:967—73.

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