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Technical note

One-stage technique for treatment of ankylosis of the temporomandibular joint, secondary micrognathia, and a prominent mandibular angle

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Ankylosis of the temporomandibular joint (TMJ) may result in substantial growth disorders and facial deformities,[1] which can be addressed with various surgical techniques.[2,3] We have developed a new technique to correct these deformities in patients with ankylosis of the TMJ, secondary micrognathia, and a prominent mandibular angle.

First, we do a layered dissection through a preauricular incision and remove the ankylosing callus. The required space between the mandibular ramus and the glenoid fossa is about 10–15 mm with the teeth in occlusion. We resect the coronoid process and transplant it on to the ramus to simulate the condyle, and then fix it with a titanium miniplate 1 mm thick (Fig. 1), which, in our experience, and that of others, provides acceptable fixation.[4] We then replace the articular disc with a pedicled temporalis myofascial flap.

Secondly, through a retromandibular incision, we expose the mandibular angle and the lower border completely. We make a cut to remove the mandibular angle prominence (Fig. 1), and put the bone aside. We trim the antegonial notch in a similar way to give the mandible a smooth appearance. Next, we make an inverted L osteotomy with a reciprocating saw to advance the mandible (Fig. 1). Once this is done we can insert the bone from the mandibular angle as a graft in the "L gap" and fix it in place with titanium plates and screws (Fig. 1). The grafted bone can finally be trimmed (and stacked in double layers if the thickness proves insufficient). Finally, if necessary, we do an advancement genioplasty to correct the deficient chin.

We have used this technique on 10 patients, all of whom remained in hospital for 3–5 days after operation and were kept in intermaxillary fixation for 2–4 weeks, after which their jaws were stable. The patients were encouraged to start mouth-opening exercises immediately after the removal of fixation and, so far, all clinical results have been satisfactory (Figs. 2 and 3).

Distraction osteogenesis and inverted L osteotomy with iliac bone grafts are commonly used for mandibular advancement. A distant donor site or second operation is usually inevitable with these techniques, however. Although our new procedure has limited and strict indications, it has given us excellent one-stage results in appropriate cases.

Ethics statement/confirmation of patients' permission

The research protocol was approved by the West China Hospital of Stomatology Institutional Review Board (WCSHIRB). Reference number: WCHS-IRB-CT-2018-0238. Wei Li. The patients involved in the article agreed with the use of photographs and the patients' consent forms have been obtained.

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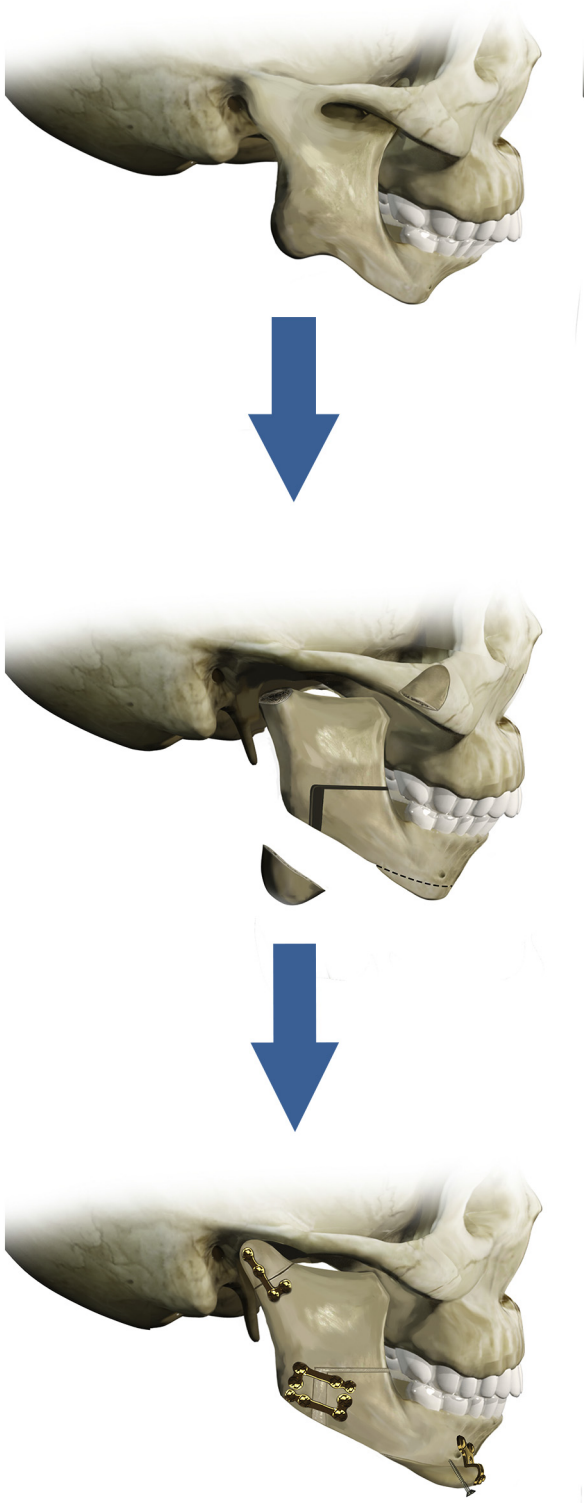

Fig. 1. The operative technique. Removal of the ankylosing callus and transplantation of the coronoid process that had been preformed to resolve ankylosis of the joint. Inverted L osteotomy with inlay bone graft from the mandibular angle and genioplasty that had been preformed to advance the mandible.

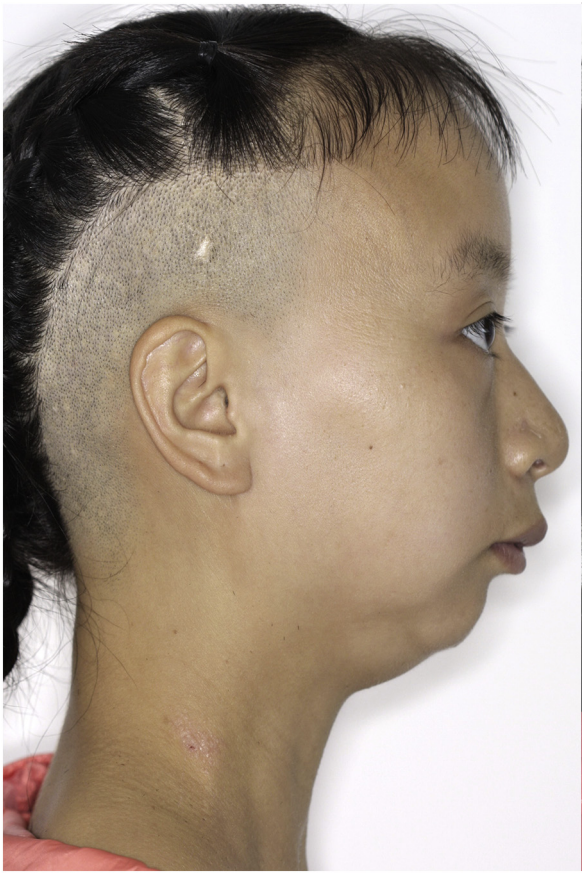

Fig. 2. Preoperative lateral view of a 27-year-old female patient who had been diagnosed with bilateral ankylosis of the temporomandibular joint and micrognathia (published with the patient's permission).

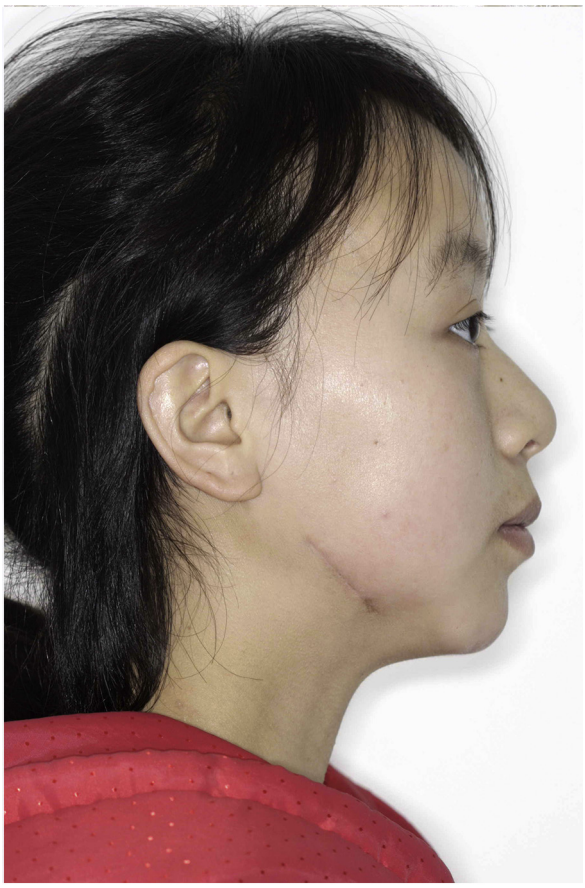

Fig. 3. Postoperative lateral views of the patient (published with the patient's permission).

Conflict of interest

This study was supported by Natural Science Foundation of China (81470720, 31271032). We have no conflicts of interest.

References

1. Kaban LB, Bouchard C, Troulis MJ. A protocol for management of temporomandibular joint ankylosis in children. *J Oral Maxillofac Surg* 2009;**67**:1966–78.
2. Al-Moraissi EA, El-Sharkawy TM, Mounair RM, et al. A systematic review and meta-analysis of the clinical outcomes for various surgical modalities in the management of temporomandibular joint ankylosis. *Int J Oral Maxillofac Surg* 2015;**44**:470–82.
3. Zhu S, Wang D, Yin Q, et al. Treatment guidelines for temporomandibular joint ankylosis with secondary dentofacial deformities in adults. *J Craniomaxillofac Surg* 2013;**41**:e117–27.
4. Zhang W, Gu B, Hu J, et al. Retrospective comparison of autogenous costochondral graft and coronoid process graft in the management of unilateral ankylosis of the temporomandibular joint in adults. *Br J Oral Maxillofac Surg* 2014;**52**:928–33.