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Simple inferior border osteotomy to prevent bad split during bilateral sagittal split osteotomy

KEYWORDS
bad split;
inferior border osteotomy;
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Bilateral sagittal split osteotomy (BSSO) is the common mandibular orthognathic surgery. Although the modifications of BSSO have been reported to reduce complications, a bad split may occur with a low incidence.[1] Here we reported a simple inferior border osteotomy to prevent the bad split during BSSO.

After the periosteal elevation of the mandibular ramus, the horizontal short lingual cut and lateral vertical cut distal to the second molar were performed till the exposure of the cancellous bone with a Lindeman burr. The inferior border was cut perpendicularly through the inferior cortical bone till just reaching the medial side. The sagittal cut was made with a piezoelectric surgical device (Piezosurgery with OT7 tip, Mectron, Italy). After the gap between the distal and medial segments was widened till the inferior alveolar nerve was exposed with bone chisels and a separator, the complete osteotomy of the mandibular inferior border was performed with a curved Steinhauser osteotome while avoiding the inferior alveolar nerve medially (Fig. 1A). And then, the mandibular split was performed with the separator in the sagittal bone cut and the elevator which was positioned at the lateral vertical cut (Fig. 1B). A malleable retractor was inserted in the bone gap to protect the inferior alveolar nerve. Then the complete split could be performed using the separator (Fig. 1C).

The incidence of the bad splits during BSSO has been reported to range from 0.2% to 11.4% per split site.[1] To prevent the bad splits, the mandibular additional inferior border osteotomies as the 4th osteotomy, which can split by less torque than conventional BSSO, were reported by several authors.[2,3] The use of an oscillating saw with an L-shaped protected shield has technical difficulties and potential risks of inferior alveolar nerve injury. The additional inferior border osteotomy with a right angle, approximately 10 mm in length, the piezosurgery tip has been also reported,[2] but the use of piezosurgery is time-consuming and the additional osteotomy under poor visualization is required. As another additional osteotomy method, Mont'Alverne et al.[4] reported a specialized additional osteotomy design (lateral horizontal osteotomy), but the modification has technical difficulties and contraindications such as great rotations to correct the occlusal plane, low height mandible, and proximity of the mandibular canal.

In conclusion, our method using the curved Steinhauser osteotome facilitates a simple and safe inferior border osteotomy without the special devices such as saws or piezoelectric surgical devices. Because mandibular additional inferior border osteotomy during BSSO may minimize the bad splits, we recommend our method described in this article.

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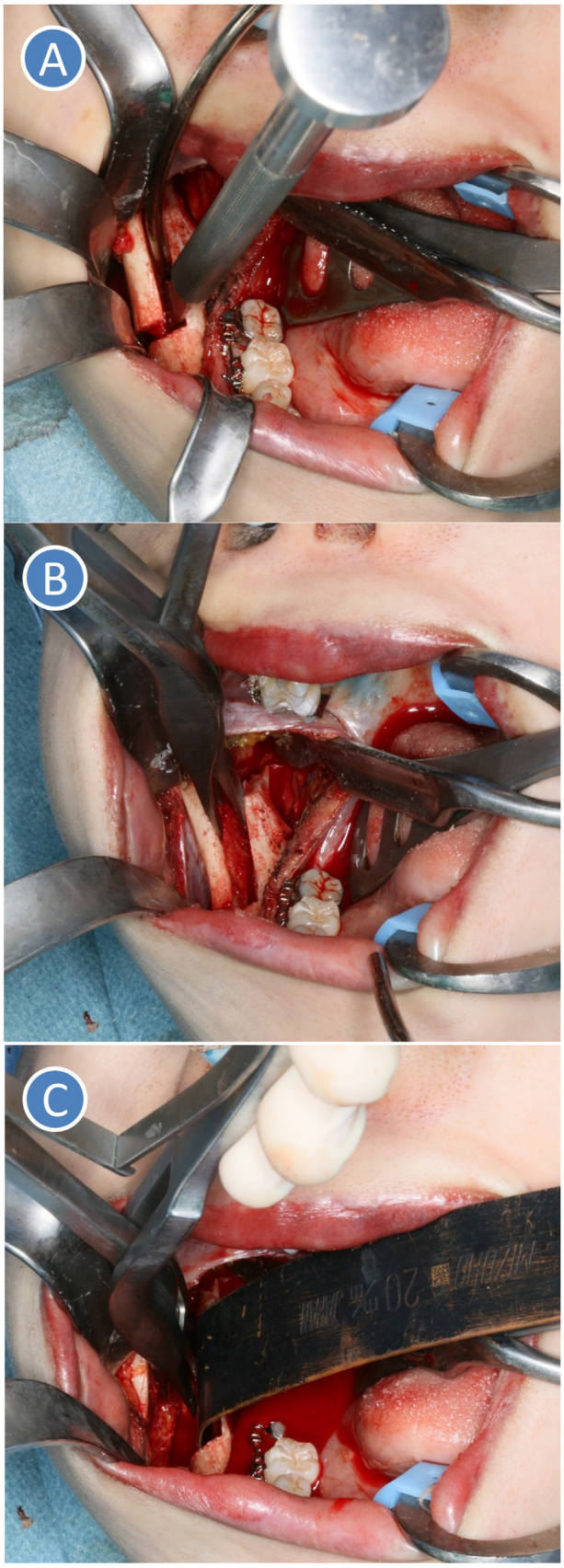

Figure 1 Intraoperative photographs.
(A) The complete osteotomy of the mandibular inferior border was performed with a curved Steinhauser osteotome while avoiding the inferior alveolar nerve medially. (B) The mandibular split was performed with the separator in the sagittal bone cut and the elevator which was positioned at the lateral vertical cut. (C) A malleable retractor was inserted in the bone gap to protect the inferior alveolar nerve, and then the complete split could be performed using the separator.

Declaration of competing interest

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

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Satomi Sugiyama
Toshinori Iwai*
Koji Honda
Kenji Mitsudo
Department of Oral and Maxillofacial Surgery/ Orthodontics, Yokohama City University Hospital, Yokohama, Kanagawa, Japan

*Corresponding author. 3-9 Fukuura, Kanazawa-ku, Yokohama, Kanagawa 236-0004, Japan.
E-mail address: iwai104@yokohama-cu.ac.jp (T. Iwai)

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