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Citation	British journal of oral and maxillofacial surgery, 58(2), 240-242 https://doi.org/10.1016/j.bjoms.2019.11.021
Issue Date	2020-02
Doc URL	https://hdl.handle.net/2115/80336
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Rights(URL)	https://creativecommons.org/licenses/by-nc-nd/4.0/
Type	journal article
File Information	Br J Oral Maxillofac Surg58(2)240-242.pdf

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Title

Adaptation of an osteotome to produce a predictable sagittal split ramus osteotomy

Keywords: Sagittal Split Ramus Osteotomy; Osteotome

Introduction

When using an osteotome, as opposed to spreader technique, for bilateral sagittal split osteotomy (BSSO), it is important to separate the buccal cortex from the intramedullary bone involving the inferior alveolar neurovascular bundle (IANB) before the split by twisting the osteotome[1)]. A thin sharp osteotome is usually malleted from the groove created on the buccal shelf, and separation is performed along the junction in advance. While malleting, special care should be taken not to damage or transect the IANB such that the IANB runs near this junction, and the buccal shelf is narrow. Braces on the buccal side of the teeth will occasionally obstruct desirable insertion of the blade. To deal with such situations, I have introduced a modified osteotome and have obtained satisfactory outcomes.

Instrument

The conventional simple osteotome (Obwegeser osteotome 01-17845, Stryker) is bent at the junction of the blade with the shaft by approximately 5 degrees (Fig. 1). This bend does not seriously impact the physical or mechanical property of the osteotome. The blade itself remains unchanged, and the slightly curved shape, as seen in commercially available device, is not formed. The simple shape enables easy insertion in the narrow and straight groove without the interferences that are caused by the bulge while using its curved counterpart. It can easily be placed on the inner aspect of the cortex and traced downward from the inferior end of the groove on the buccal shelf by malleting (Fig. 2).

The intramedullary bone, involving the canal of the IANB, can be clearly scraped from the inner aspect of the cortex. During tracing, although the blade tip losing contact with the inner aspect cannot be avoided because of the anatomical structures, directly hitting the IANB can be avoided, as the direction of travel is away from that of the bundle.

Moreover, this unique structure is useful to perform short lingual ramus osteotomy. Generally, vertical osteotomy should be performed on the buccal cortex and extended slightly beyond the inferior border. Creating a small crack at the innermost corner of the inferior border, where the inner edge of the mesial stump in the proximal segment is produced, may be important for a desirable split, in which the split line runs on the medial aspect of the mandibular body and ensures a short lingual split. Thus, this osteotome is useful for positioning, and desirable forces can be exerted in the inferomedial direction with the first blow to initiate the split. Another key to creating a crack is that the distal two-thirds of the tip is placed on the inner aspect of the cortex, and the mesial one-third is not in contact (Fig. 3), as it creates a reliable crack at the edge, which decides the split modality.

Conflict of Interest

None

Ethics statement/confirmation of patient's permission

Not required.

References

1. Bell WH, Hall HD, White RP, Proffit WR: Sagittal Split ramus osteotomy. In: Bell WH, Proffit WR, White RP ed. Surgical correction of Dentofacial deformities. Philadelphia: WB Saunders, 1980, 898–901.

Figure legends

Figure 1

The novel osteotome with a bend at the junction between the blade and the shaft

A: Novel bent osteotome

B: Normal osteotome (Control)

Figure 2

Image of separating the buccal cortex from the intermedullary bone using the novel osteotome

This configuration works as a scraper rather than an osteotome, and IANB injury can be avoided. Braces on the buccal side do not disturb the manipulation of the osteotome. (Arrow: IANB, Arrowhead: desirable crack for short lingual split)

Figure 3

Image of creating a crack at the inferior border

For the backward movement, the panel of the buccal bone has been removed. To initiate a desirable ramus split, a small crack should traverse downward, inside the inferior border. The tip of the blade should be placed at the innermost position. This novel osteotome accommodates the IANB and ensures a small crack in the desirable direction.

Figure 4

Three-dimensional image of placing the osteotome

A small crack is created at the innermost position of the mesial stump of the residual buccal cortex facing the gap. The distal two-thirds of the tip is placed on the inner aspect of the cortex.

Figure 1

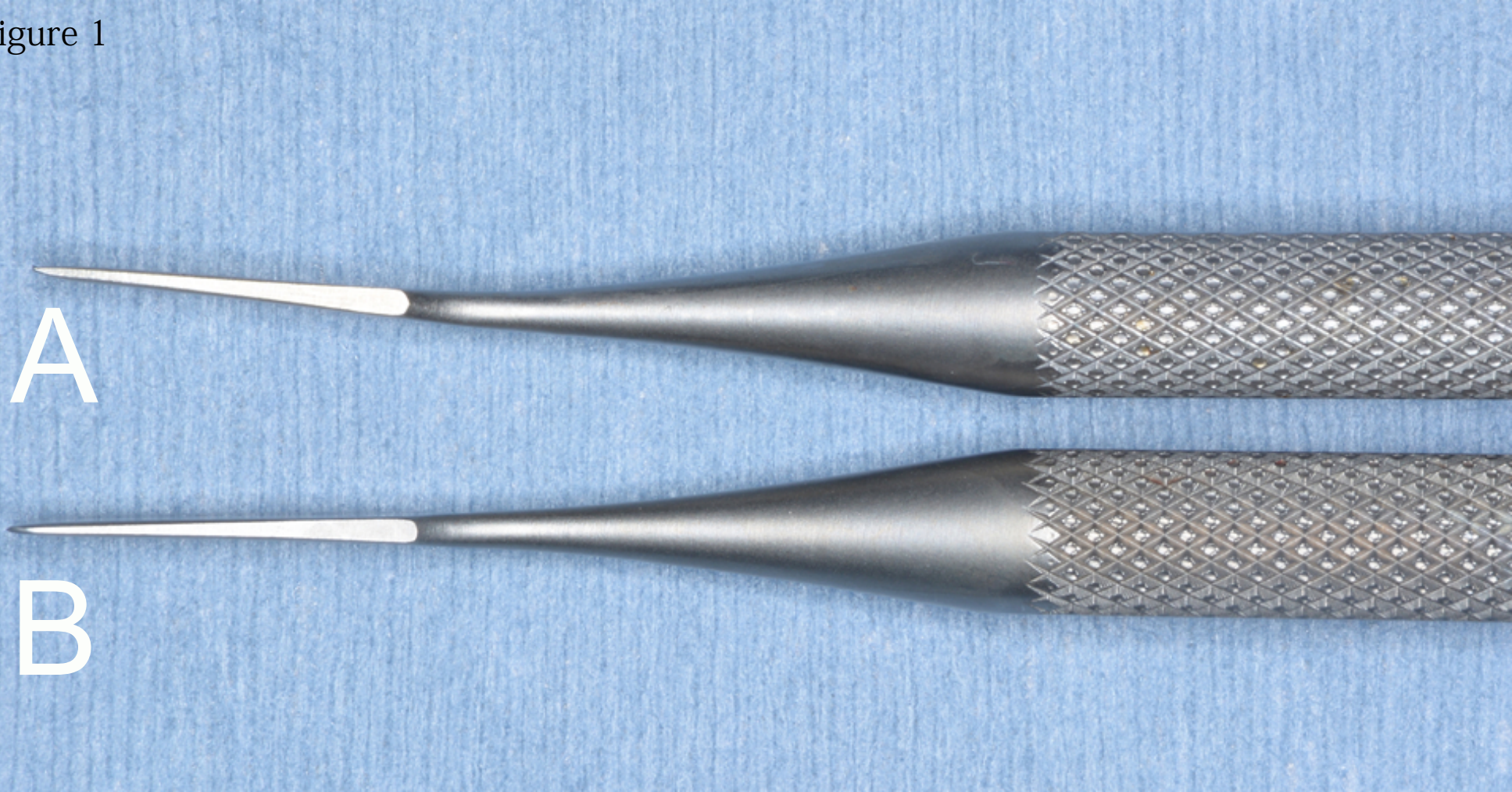

Figure 2

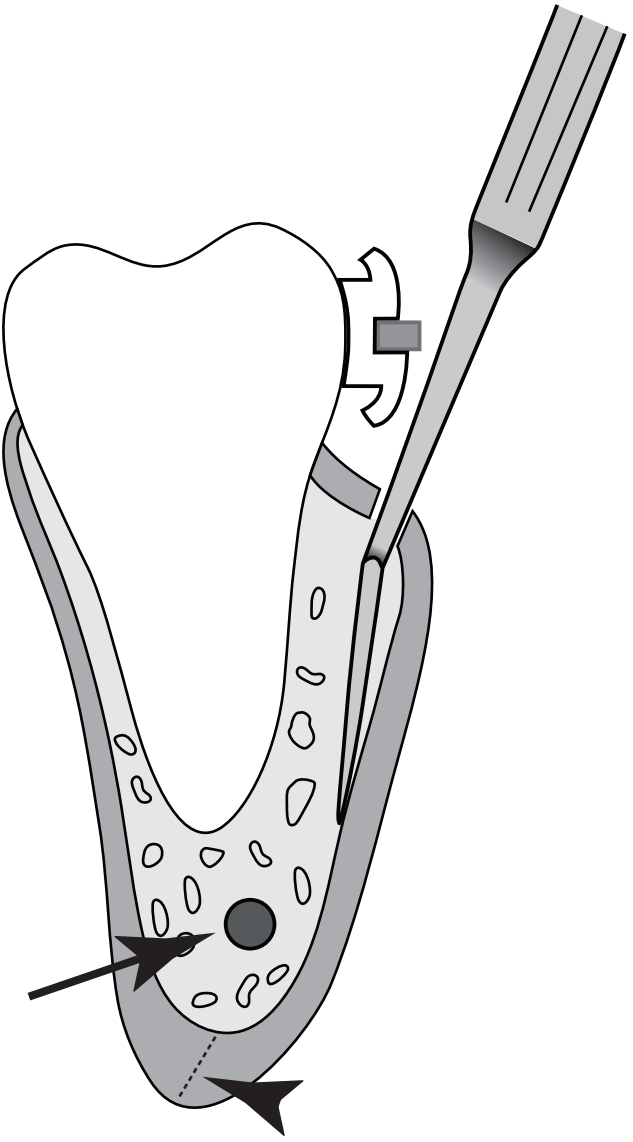

Figure 3

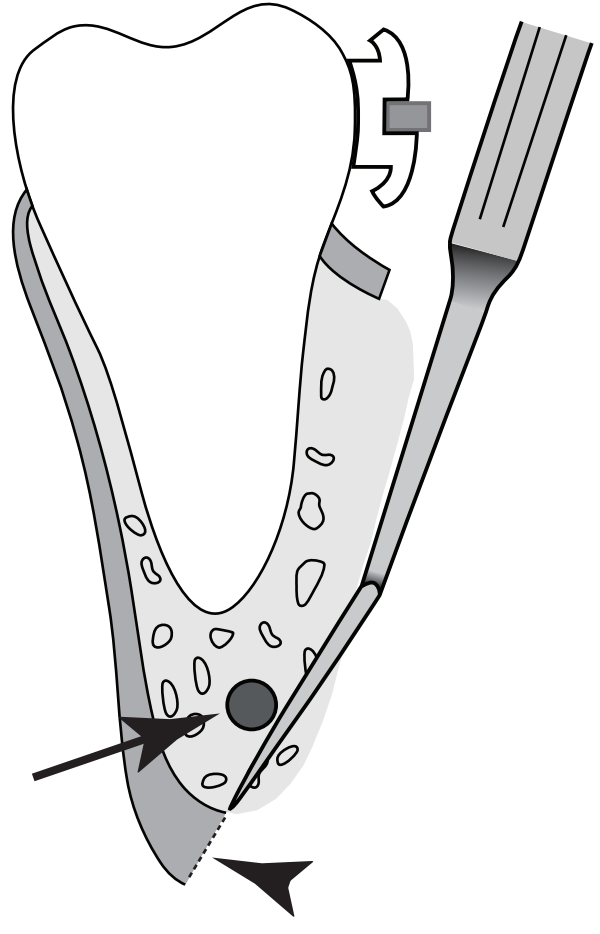
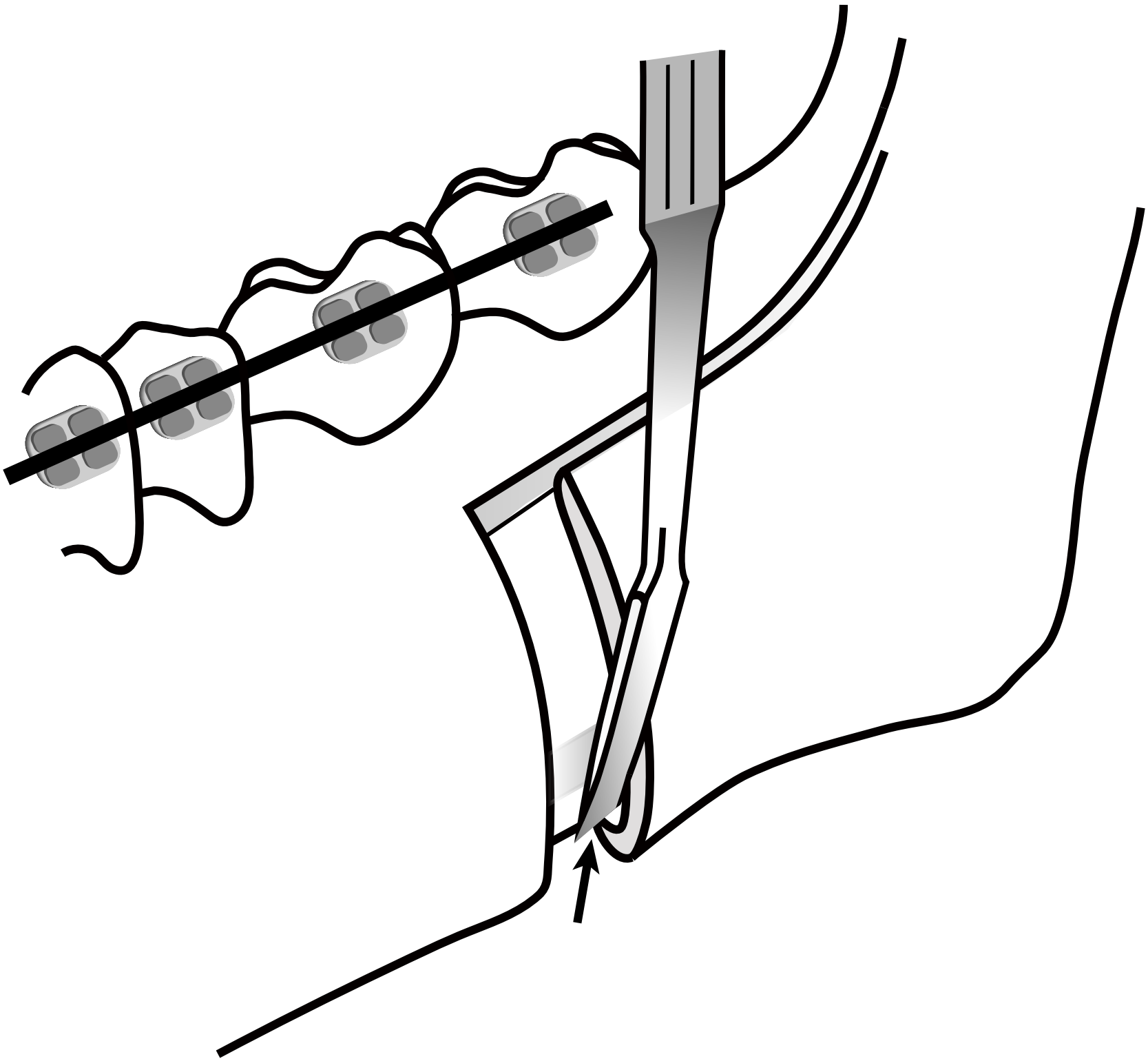
Figure 4