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# 7.3.3 Subapical (block) and segmental maxillary osteotomies

Subapical (block) and segmental osteotomies can be performed either as an isolated procedure or as part of a total jaw osteotomy. The maxilla can be segmented anteriorly, or laterally, or in combinations of both (multi-segments). Theoretically, the blocks or segments can be moved in all three dimensions but practically, the movement is limited by the elasticity of the attached soft tissues which are essential for blood supply to the bone. Generally, elongation and widening of the dental arch is more difficult than impaction and narrowing. The maximum range of movement is difficult to predict while a case is planned, however, movements are usually possible for corrections in a range of around 5–10 mm.

The size of the blocks or segments depends on the individual situation and planning. Typically, a block or segment contains a couple of teeth. A reduction of fragment size to only one or two teeth can be critical with regard to blood supply.

When performing a block or subapical osteotomy the continuity of the mandible or maxilla is maintained. A segmental osteotomy separates the mandibular or maxillary continuity (**Fig 7.3.3-1a–b**).

## 1 Historical background

Subapical and segmental osteotomies to correct orthognathic problems were developed in a period when surgical skills and anesthesia allowed for this kind of surgery. Whereas orthodontic techniques, especially with fixed appliances for adults, were not routinely part of the combined treatment. A new dimension of segmentation of the maxilla was reached in the 1970s and later, after Bells method of maxillary "down fracture" had become standard. As part of a total osteotomy, segmental osteotomies were performed with up to twelve pieces.

Today, with the advances in orthodontic treatment, the indications for segmental osteotomies in orthognathic surgery have substantially decreased. It can be an alternative if orthodontic treatment is not available, not desired by the patient, or for shortening of treatment. Nowadays, there is again a tendency towards subapical and segmental osteotomies because of the advent of distraction osteogenesis.

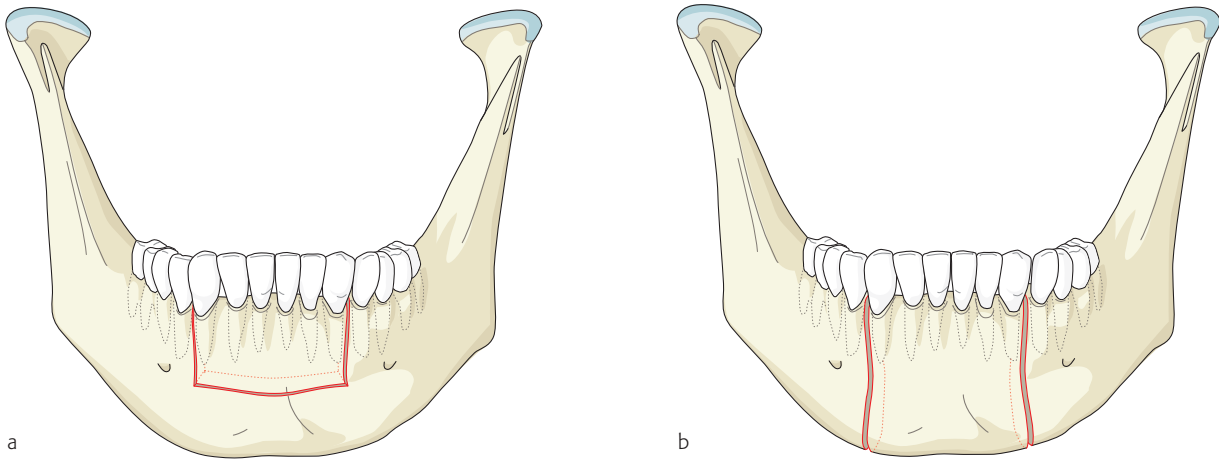


**Fig 7.3.3-1a–b**
**a** Block or subapical osteotomy in the mandibular front.
**b** Segmental osteotomy in the mandibular front.