To avoid the previously mentioned consequences, position screws are introduced to fix the fragments. With these, the gap between the fragments can be maintained. Bone grafts may be positioned between the fragments to avoid compression and movement of the proximal fragment. Sometimes it is indicated to use lag screws in combination with position screws (**Fig 7.2-9a–b**). When advancing the mandible, the lag screw is used to stabilize the posterior natural contact area and the anterior area is fixed with position screws which can be placed through a sandwiched bone graft, if necessary. It should be noted that in setbacks, the natural contact area is situated in the front allowing lag screw fixation. Typically two or three 2.0 mm titanium screws are used in a linear or triangular fashion (**Fig 7.2-10a–c**).

Monocortically fixed miniplates are an alternative to stabilize fragments. The stability is adequate and predictable. 2.0 mandibular or Matrix plates can be used, usually with six holes (**Fig 7.2-11a–b**). There is also a specially designed 2.0 plate with an adjustable slider (SplitFix) for sagittal split osteotomies (**Fig 7.2-12**). Injuring the nerve by the screws and by compression can be avoided because the fragments are not pressed against each other. The plate can be bent according to the anatomical situation and flaring of the anterior end of the proximal fragment can be maintained. Thus, the unwanted torque and the movement of the condyle are avoided. The application of a plate requires the vertical osteotomy to be seated further anteriorly, sometimes between the first and second molars, thus increasing the risk of buccal plate fractures (bad split) and nerve injury.

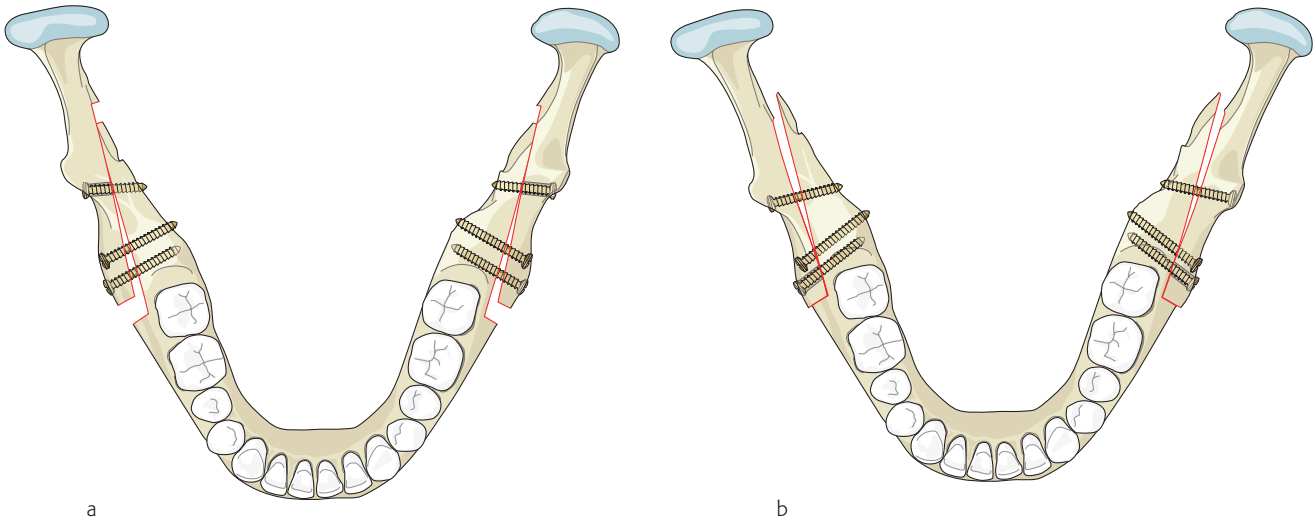

Fig 7.2-9a–b Correct fixation of sagittal split osteotomies, for mandibular advancement (a) or mandibular setback (b) with position screws and lag screws.

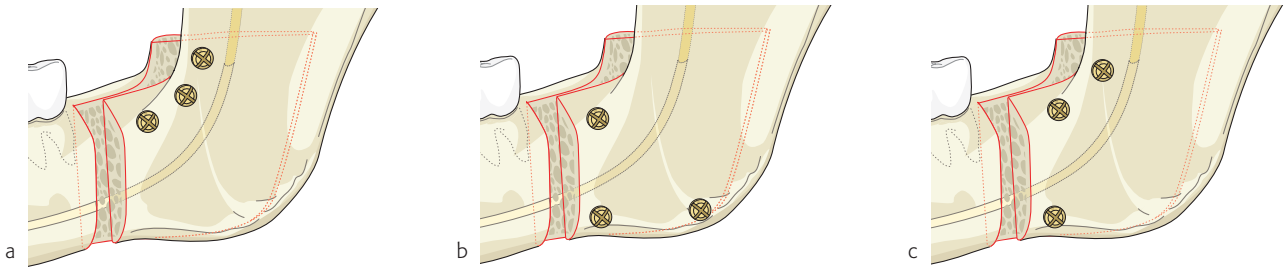

Fig 7.2-10a–c The possible placements of either lag or positioning screws:
a Along the superior rim.
b Triangular with one screw superiorly.
c Two screws superiorly, one screw caudally.

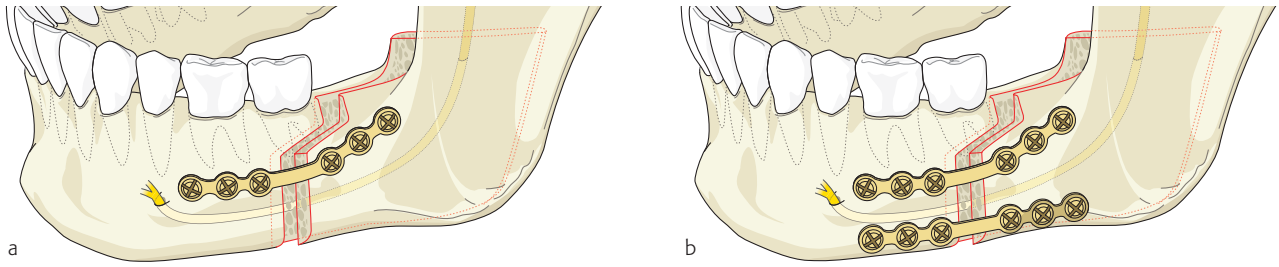

Fig 7.2-11a–b Monocortical fixation of sagittal split osteotomies with either one (a) or two (b) 2.0 mandibular or Matrix plates.

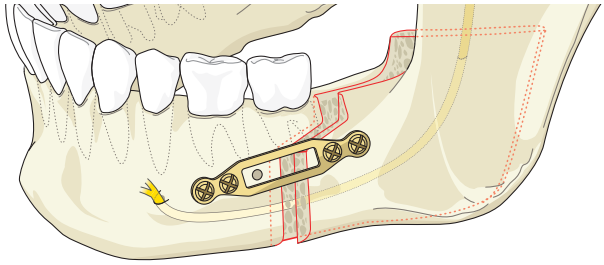

Fig 7.2-12 Fixation of sagittal split osteotomy with an adjustable slider fixation device. Fixation is done with monocortically placed screws.

For fixation, an adequate plate is selected and bent according to neutral positions of fragments, holding the proximal fragment in the correctly seated position. At least two screws should be inserted in the proximal and two in the distal fragment. The neurovascular bundle is identified at the mental foramen. Nerve injury must be avoided. The plates are fixed transorally, and placement of the proximal screws rarely requires transbuccal instrumentation or the use of an angulated screwdriver.

After fixation of both sides, MMF is released. The occlusion is checked making sure that the condyles are correctly placed within the fossae. In case of occlusal problems, MMF should be reapplied. Removing the screws at the distal fragment only is sufficient in the majority of those cases. The proximal fragment is seated again with extra care and the plate is again adjusted. New holes are drilled and screws inserted. Rechecking is performed after releasing the MMF. The patients are not kept in postoperative MMF, but the splint is usually fixed to the brackets in the maxilla with thin wire ligatures.

Light guiding elastics are often used at least until the splint is removed, approximately 2–4 weeks postoperatively. Policies with splints and guiding elastics differ a lot between centers, but rigid MMF is usually not required.

Fixation with bioresorbable osteosynthesis material is an option in sagittal split osteotomies. When bioresorbable plates are used, 2.0 mm screws are preferred. The plate should not be placed directly under the incision. The area under the attached gingiva should be avoided to enable good soft-tissue coverage. Being situated lower, the plate will not be palpable and a proper soft-tissue coverage makes undisturbed degrading possible. At least three screws should be placed in each fragment to provide adequate stability. In some cases formation of granulation tissue occurs. Surgical treatment is needed only if there is loose material palpable. Wound dehiscence may occur in rare cases. If a plate is exposed immediately after the operation, revision and wound closure should be done. If that happens 2 months postoperatively or later, the plate and screws can be removed. These problems are rare and occur similarly when other materials are used.