



RAPID. SAFE. SECURE.

TECHNIQUE GUIDE

Developed in collaboration with
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Otolaryngologist / Facial Trauma Surgeon

Minne Ties[®] Agile MMF (dental occlusion ties) are an innovative, patented technology to rapidly, safely and securely achieve maxillomandibular fixation (MMF). Indications for use include pre-operative, per-operative, short-term (up to 3 weeks) for minimally displaced fractures, and for splintage post jaw dislocation.

The Minne Ties innovative design provide key benefits:

- **Surgeon Safety** – elimination of sharp wires that can cause glove punctures and sharps injuries
- **Time and Cost Savings** – application in 7-10 minutes and removal in 2-3 minutes.
- **Efficiency and Flexibility** – application and removal in the OR, ED or clinic without the need for general anesthesia
- **Patient Safety** – reduced risk of damage to gingival tissue, tooth roots, and sensitive oral mucosal tissue
- **Patient Comfort** – Completely smooth with rounded corners; no sharp wire or abrasive metal.
- **Low profile** – requires less space for better access, visibility and tangle-free suturing

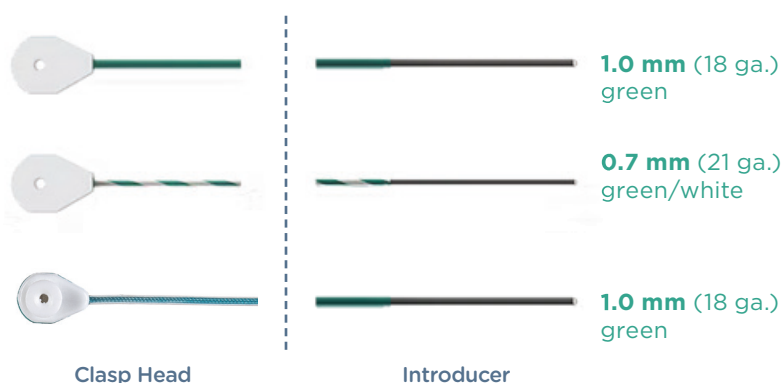
ABOUT THE MINNE TIES MMF SUTURE SYSTEM

Minne Ties are available in three configurations allowing optimal application for each patient's unique situation:

- **The Minne Ties Kit** (Product Code MT-1000) includes 12 sutures, with ten Standard 1.0mm (18ga) solid green Ties, two Supplemental Thin 0.7mm (21ga) green/white Ties, and a cheek retractor uniquely designed to organize the Ties.
- **Minne Ties Two-Packs** including two sutures of the same size (Product Codes MT-1001: two 1.0mm/18ga Ties and MT-1002: two 0.7mm/21ga Ties).
- **Minne Ties Anchorage Two-Packs** includes two 1.0mm (18ga) Ties with a rounded protruding hook that is an anchorage point to facilitate MMF with elastics (Product Code MT-2000).

Materials

Polypropylene, Polyester, Stainless Steel



Always refer to the instructions for use before using any Minne Ties products.

The Minne Ties Agile MMF Suture System is an adjustable, flexible plastic band that wraps between and around a tooth or teeth to create an anchorage point for maxillomandibular fixation and immobilization by applying an independently balanced series of sutures bilaterally between and/or around teeth in the interdental space (i.e., triangular apical embrasure). See Figure 1.

Use a minimum of four 1.0mm/18 ga sutures to obtain maxilla-mandibular fixation (MMF).

For short-term (up to 3 weeks) rigid fixation, it is recommended to use a minimum of six 1.0mm/18 ga sutures placed in molars/premolars with tight interproximal contacts. Tight interproximal contacts are defined as ≤ 0.5 mm.

The sutures are applied between teeth in the interdental space and should be applied from the posterior dentition to the anterior dentition. As the maxilla is typically more stable than the mandible in facial trauma, the sutures typically cinch better when looping through the maxilla embrasure first, in a buccal to lingual direction, followed by placement through the mandibular embrasure in a lingual to buccal direction.

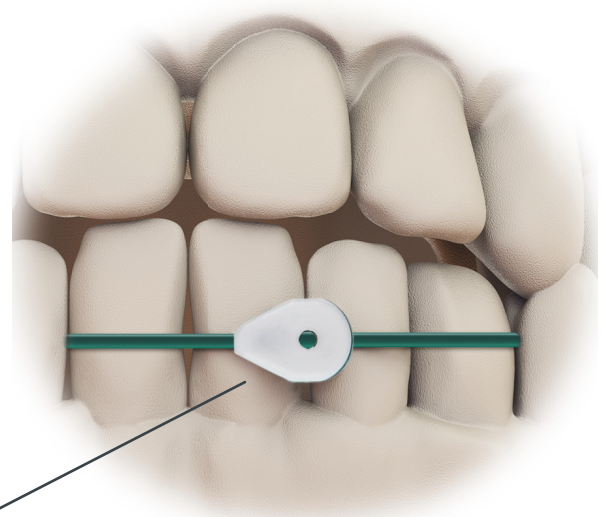
The sutures are applied through the interdental space with a nearly identical technique to wire application. The introducer can displace the apical papilla atraumatically within the apical embrasure.

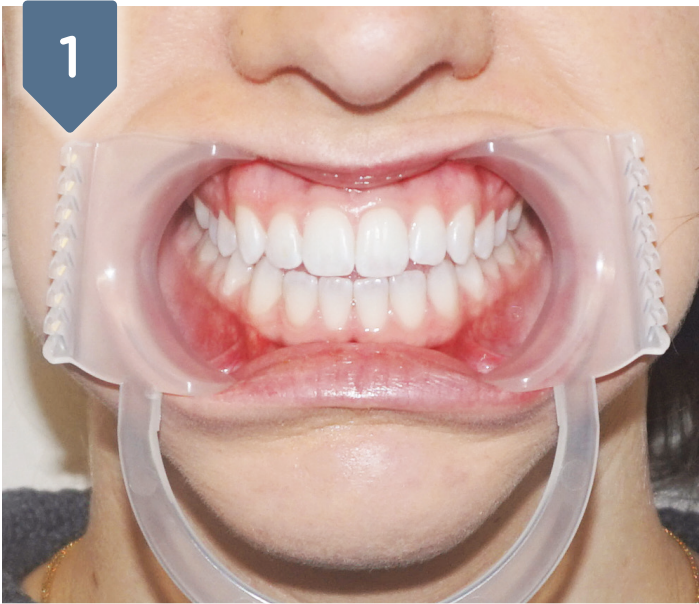
Note: The sutures can also be applied in a bridle wire fashion to help maintain reduction (see Figure 2) and for use with elastics (see Page 8).

Figure 1

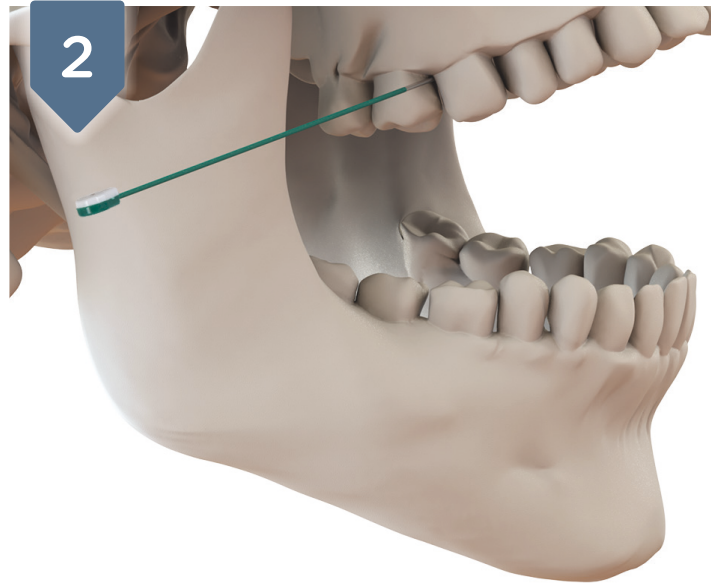


Figure 2

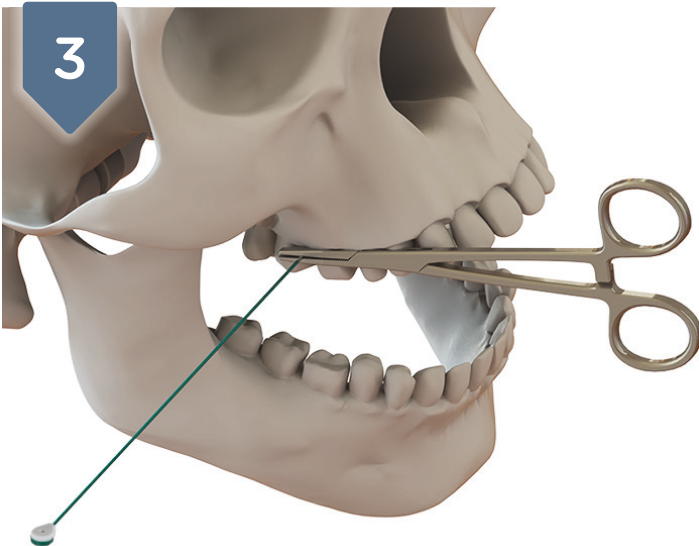




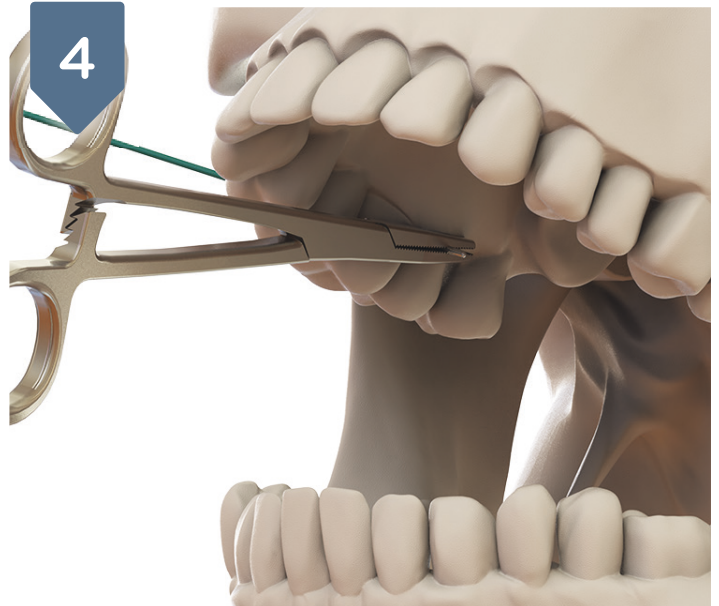
The cheek retractor is included in the 12-pack. Insert as shown.



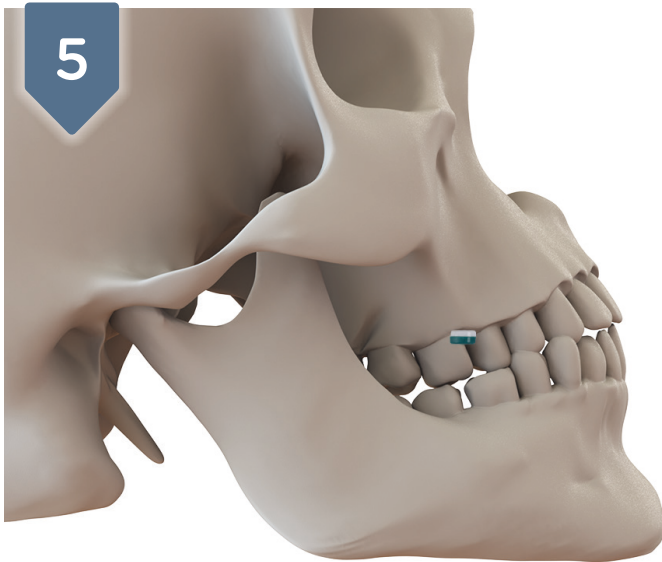
Start with the largest size Minne Tie and downsize if you need to — the introducer is the sizer. Use the introducer to probe the embrasures.



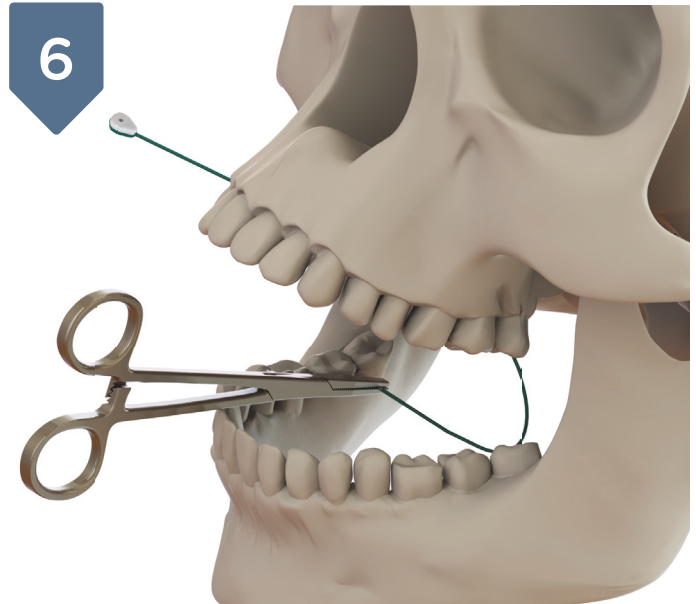
Start posteriorly and insert the introducer using a needle driver. Enter the maxillary embrasure from the buccal side and push through the embrasure to exit on the lingual side.



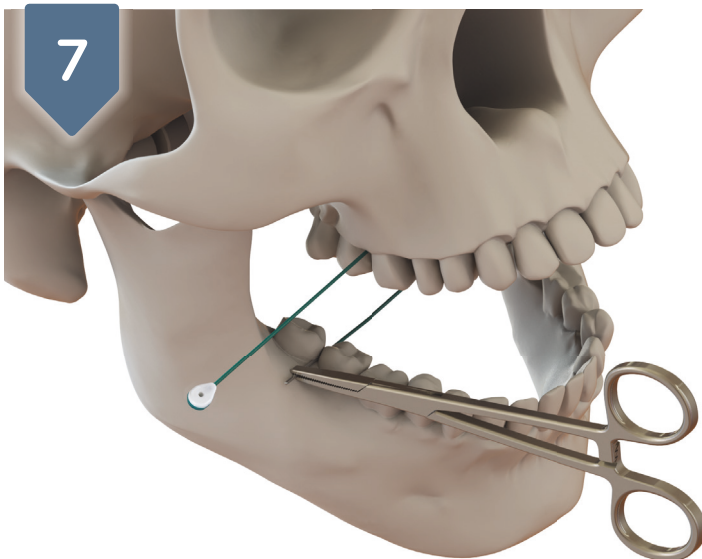
Maneuver the needle driver to grasp the introducer on the lingual side. Complete crossing the embrasure by pulling the suture until clasp head is 2.5-5.0 cm from teeth.



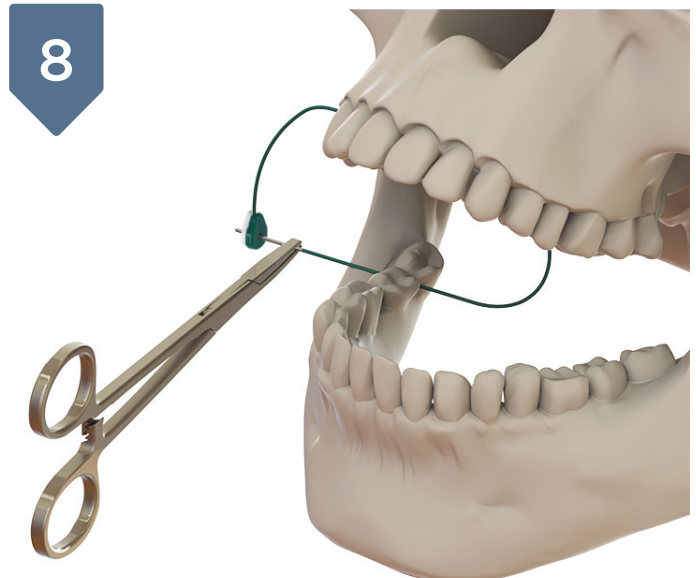
After placing the tie through either the mandible or maxilla embrasure, place the teeth in occlusion. Confirm that the teeth are lined up vertically before placing tie in the corresponding embrasure.



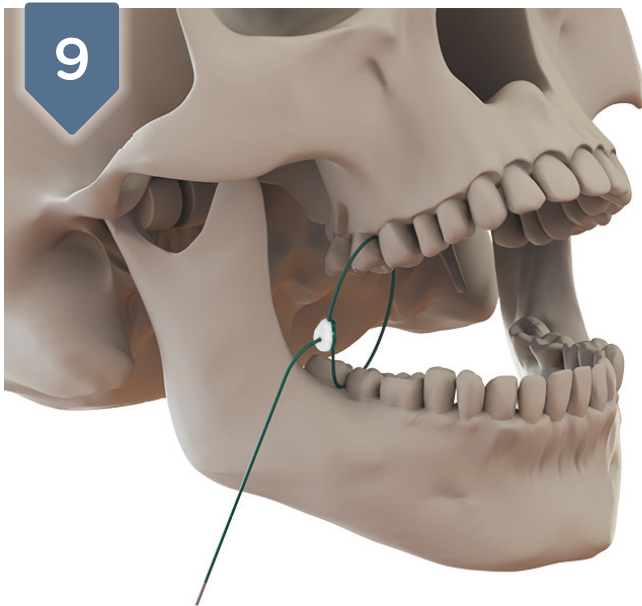
Advance the needle driver to the mandible lingual side. Push across embrasure to exit on the buccal side.



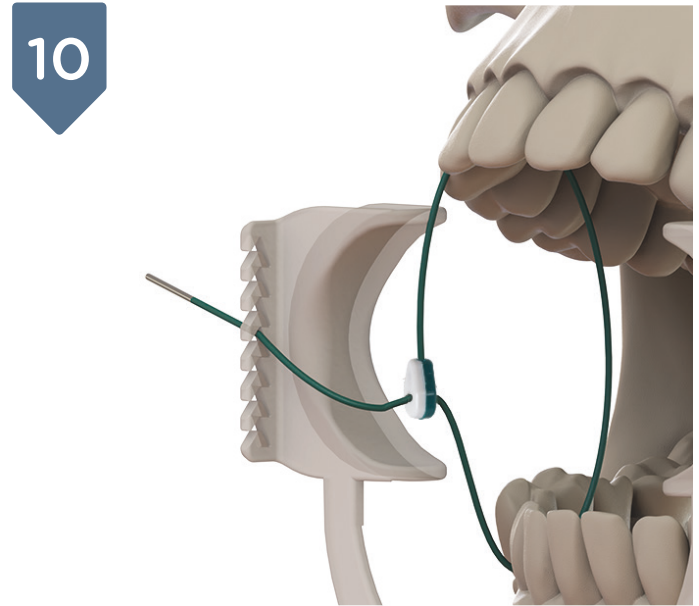
Pull the suture through, while ensuring the clasp head remains 2.5-5.0 cm (1-2") from teeth. The maxilla and mandible should remain separated at this point in the procedure.



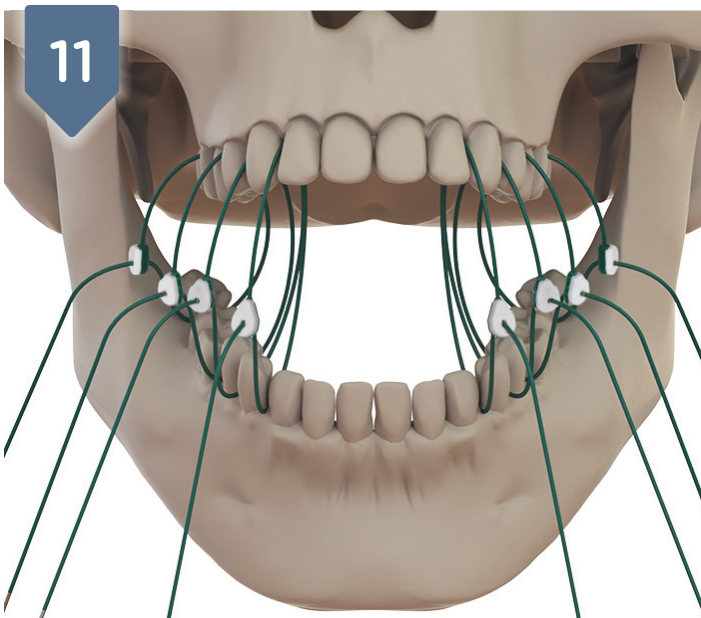
Using needle driver, advance the introducer through the GREEN SIDE of the clasp head.



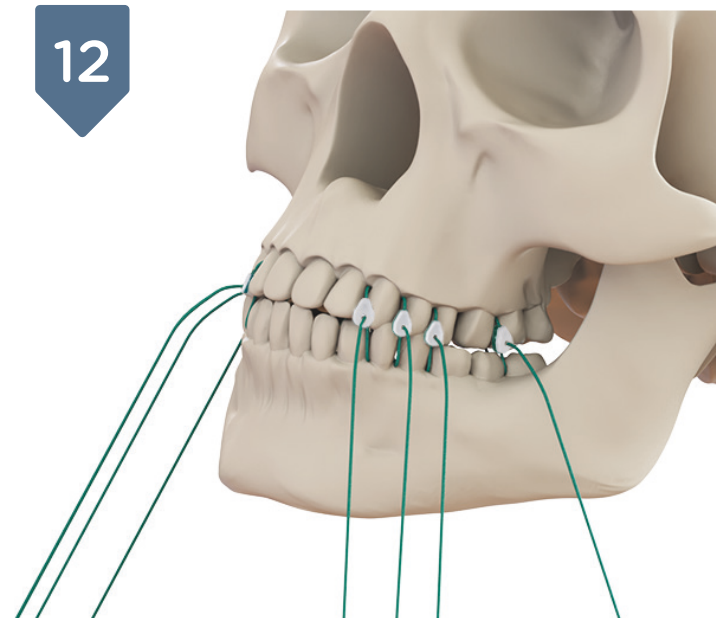
Tighten to reduce the diameter of the loop — final tightening will occur after all the sutures are placed.



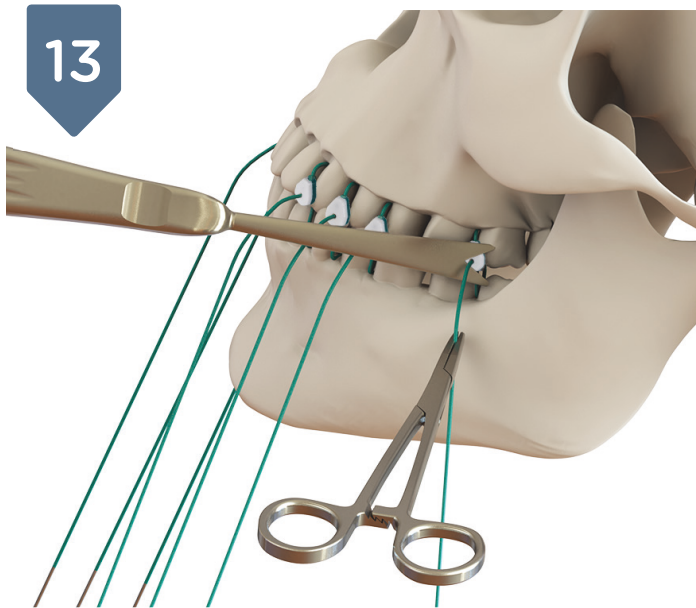
The slotted sections of the cheek retractor will hold and help manage the sutures during the procedure.



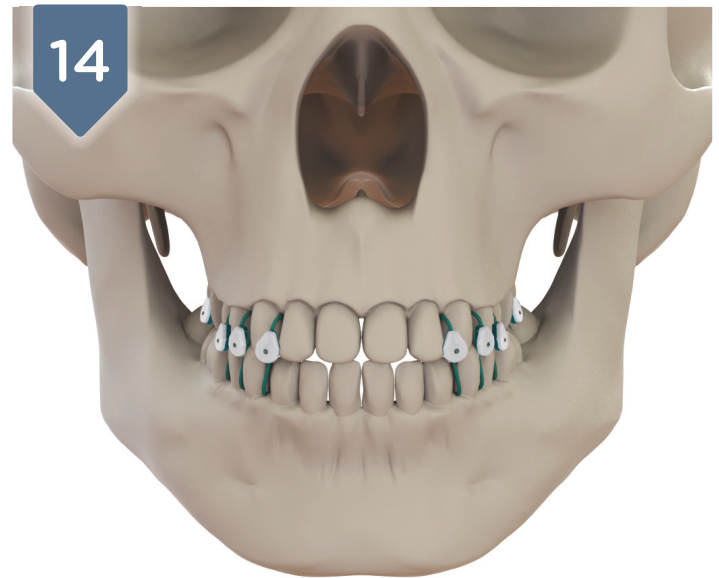
Once a minimum of four (4) or a minimum of six (6) sutures are placed, the dentition should be placed in occlusion. A gentle rocking motion will help ensure each suture is pulled through any tissue. Secure the sutures against the teeth sequentially from anterior to posterior. Cinch them inferiorly: this will pull against the typically stable maxilla by pulling on the suture.



To cinch pull on the suture, not the introducer. Apply cinching force with your gloved fingers for best tactile feedback. Ensure slack in the suture on the lingual side is eliminated during final tightening.

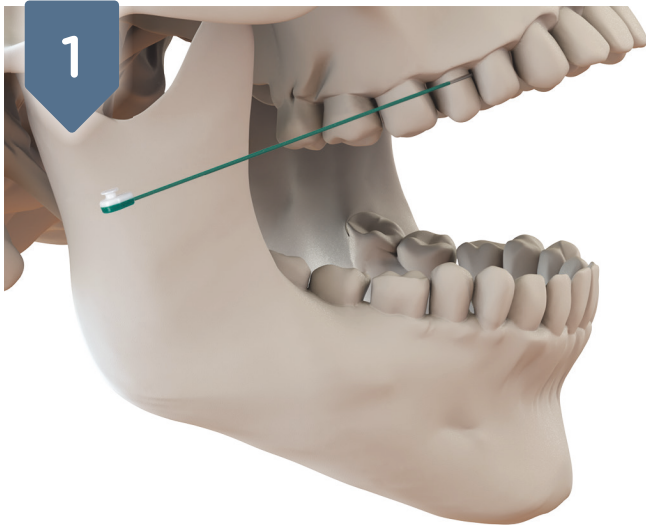


The clasp should be pressed against the dentition to complete tightening. Applying a pickle fork or needle driver on the clasp of the Minne Tie may assist cinching the last 2-3 mm. However, if a needle driver is used to do final tightening, grasp the suture not the introducer.

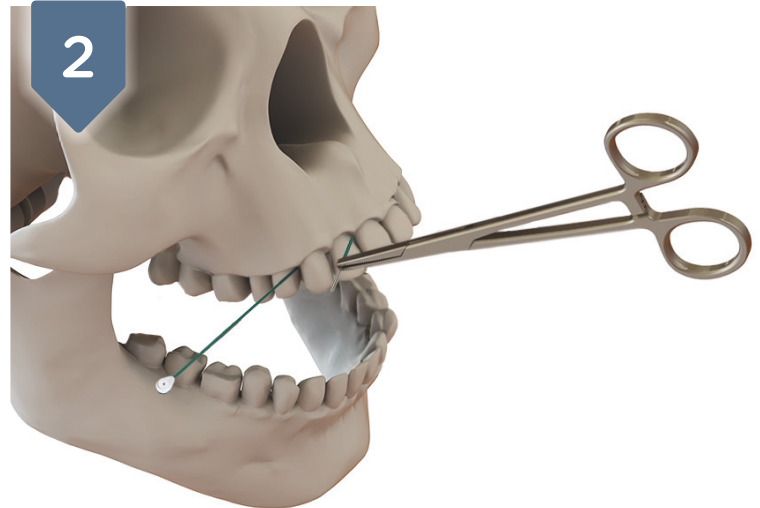


When MMF is established, and after the final tightening has occurred, trim the sutures. For temporary intraoperative MMF, leave a short tail of $\frac{1}{2}$ " in case additional tightening is required. For short term MMF (up to 3 weeks), trim the sutures flush with a blade.

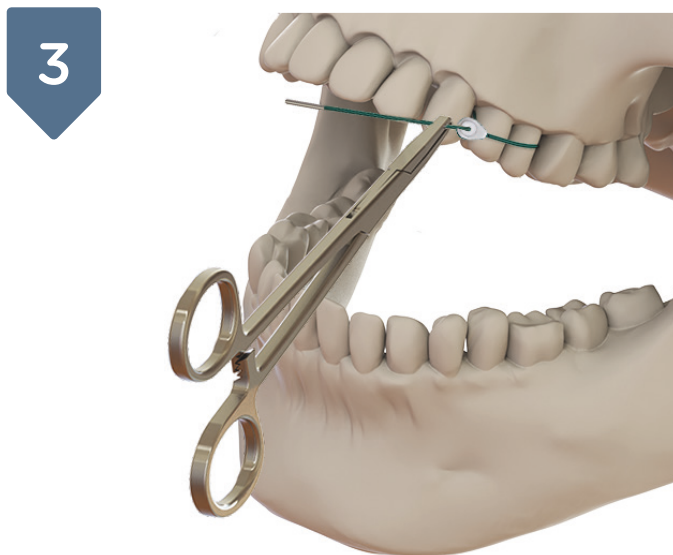
Minne Ties Anchorage Application Steps 1-4



It is recommended to apply Minne Ties Anchorage circumdentally around two teeth. Insert the introducer with a needle driver. Enter a maxillary embrasure from the buccal side and push through the embrasure to exit on the lingual side. Grasp the introducer on the lingual side.

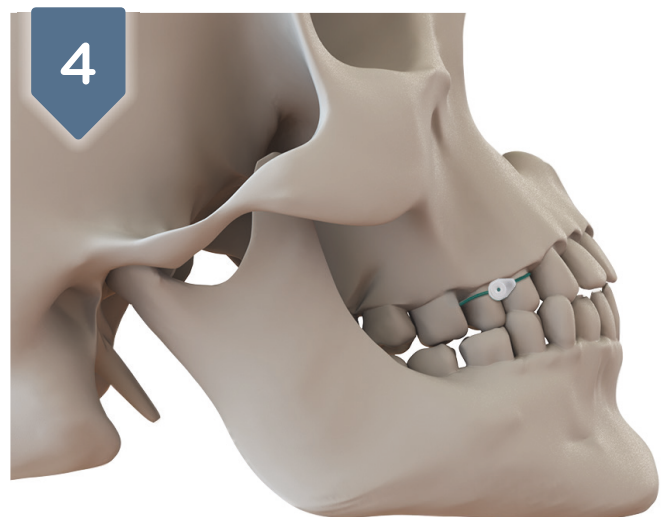


Use a needle driver to advance the introducer through another maxillary embrasure to exit on the buccal side. Grasp the suture on the buccal side with a needle driver to pull it through embrasure.



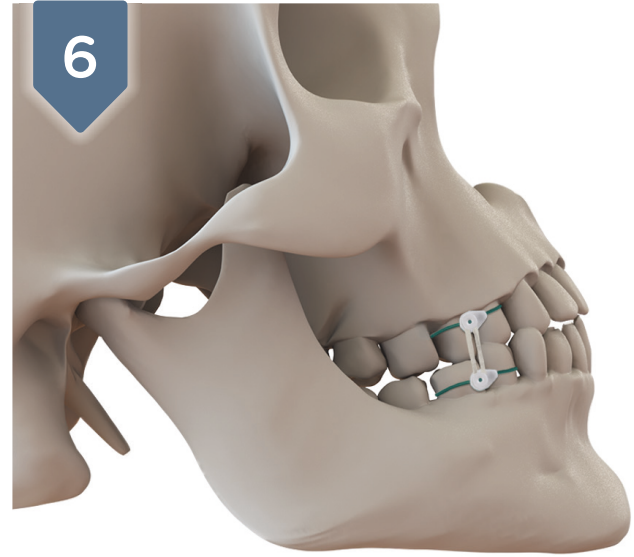
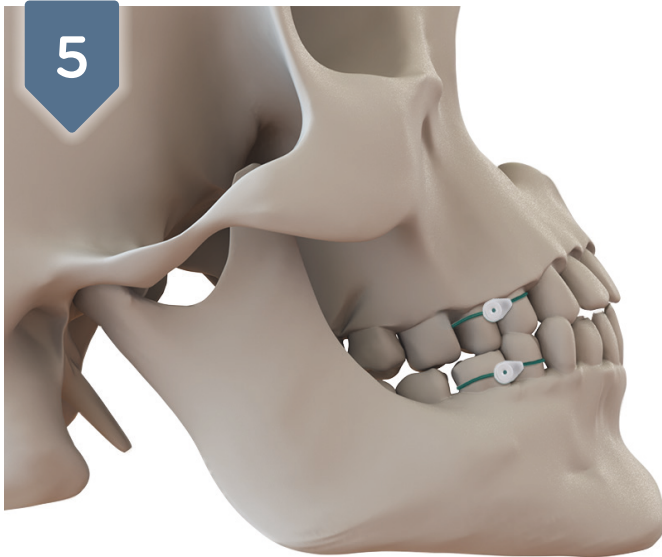
Using a gloved hand or needle driver, advance the introducer through the GREEN SIDE of the clasp. To cinch pull on the suture, not the introducer, while at the same time pushing the body of the clasp against the dentition.

Apply cinching force with your gloved fingers for best tactile feedback. Ensure slack in the suture on the lingual side is eliminated during final tightening.



Continue tightening until the circumferential loop is secure and stable. The protruding round hook on the white side of the clasp creates an easily accessible anchorage point.

Minne Ties Anchorage Application Steps 5-6



Repeat the above process to apply an Anchorage Tie on the mandible side, ensuring the circumferential loop is secure and stable.

Apply in the same fashion to the opposite side of the arches for a bilateral construct.

For short term MMF (up to 3 weeks), trim the suture flush using a blade.

Utilize the rounded protruding hook on each Tie as an anchorage point to apply a single guiding elastic. Begin by wrapping the elastic around the rounded hook on either the maxilla or mandible side. Extend the elastic to the opposite side and wrap it around the protruding hook.

For additional clinical information and application training:

- Visit <https://www.minneties.com/resources>
- Call Invisian Medical at 913-228-1857
- Email Invisian Medical at customerservice@minneties.com