



MINNETIES[®]
AGILE MMF

INSTRUCTIONS FOR USE

Indications for Use

The Minne Ties® MMF Suture System is an adjustable flexible plastic band that wraps between and around a tooth to create an anchorage point for maxilla-mandibular fixation and immobilization.

Minne Ties MMF Suture System is suitable for:

- Pre-operative fixation
- Per-operative fixation
- Short-term (up to 3 weeks) fixation for minimally displaced fractures
- Splintage post jaw dislocation

Contraindications

- Unstable or complex fractures that cannot be stabilized in occlusion using the system
- Patients with severely comminuted fractures, extensive alveolar bone fractures, missile injuries
- Patients for whom maxilla-mandibular fixation represents a higher than usual psychological or physical risk
- Patients who are unwilling or unable to adhere to restrictions in eating and mouth opening associated with maxilla-mandibular fixation
- Patients with limited quantity or quality of embrasures or dental neglect
- Patient has an active or latent infection
- Patients in whom damage to un-erupted permanent teeth is anticipated
- Patients with periodontal disease and/or dental neglect

- Patients with orthognathic surgery
- Patients with a seizure disorder
- Patients with a compromised airway
- Patients who are immune compromised
- Patients with improper dentition, extensive crown, bridge work or dental implants
- Use with children (under 15 years)

Warnings And Precautions

- Before using the System, read and understand all supplied instructions for use. Pay special attention to warnings and precaution information, indications for use, contraindications, potential adverse effects, compatibility and correct handling of the System
- The healthcare professional should be thoroughly familiar with the procedure and use of the device
- Responsibility for proper selection of patient, adequate training, experience in the selection and placement of the System and the decision to leave or remove the System post-operatively rests with the healthcare professional
- Proper placement of the mandibular condyle is essential prior to fixation of the fracture
- To avoid floss out, place the largest size suture possible.
- The Minne Ties MMF Suture System is Single Use Only and is provided STERILE. Single use devices cannot be reused, as they are not designed to perform as intended after the first usage
- After removal, contaminated system must be disposed of properly

- Do not use the System if there is damage to the pouch that would breach sterility of the System
- Prior to use, inspect the System Sutures and cheek retractor for damage. Do not use if damage exists
- Do not use for more than 3 weeks. If longer use is deemed necessary, then the healthcare professional should replace the current system with a new system.
- 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.

Potential Adverse Effects

- Nonunion or delayed union of the fracture
- Pain, discomfort or abnormal sensations due to the presence of the device
- The device may loosen while installed
- Biomechanical complications due to improper positioning of the mandibular condyle
- Malocclusion
- Difficulty with oral hygiene
- Tissue necrosis due to compression on the gingiva
- Inadequate healing

Minne Ties® MMF Suture System Description

The Minne Ties MMF Suture System contains various sized sutures, 1.0 mm (18 ga.), 0.7 mm (21 ga.), used to establish maxilla-mandibular fixation (MMF) 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) (**Figure 1**). The sutures provide a stabilizing occlusive force allowing for short term (up to 3 weeks) fixation for minimally displaced fractures, for pre-operative and per-operative fixation and splintage post jaw dislocation. 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.

Refer to the Technique Guide at www.minneties.com for additional directions for use.

Figure. 1



The Minne Ties MMF Suture System is made of:

- Sutures: Plastic (white polypropylene, green polypropylene, green polyester, green/white polyester, white polyester) and stainless steel



Directions for Use

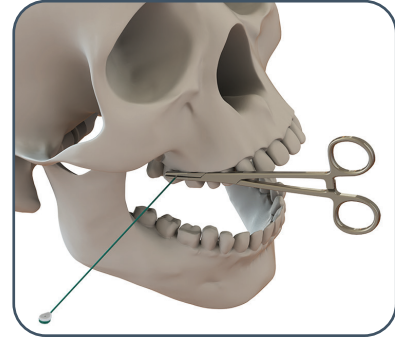
Pre-operative

- Before applying Minne Ties, the patient's occlusion should be assessed. Attention should be paid to how the mandibular and maxillary dentition interfaced previously. It is the surgeon's responsibility to confirm optimal dental occlusion. After the Minne Ties are applied, correct occlusions must be confirmed before final tightening of the devices.
- Assess which teeth will serve for anchorage by viewing the pre-operative imaging (i.e., x-ray, CT scan)
- 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.
- Choose teeth with good bony support which are not overly crowded and which have contact points on both sides
- Check health of anchored teeth
- If left on post-operatively, follow-up must be conducted at regular intervals (e.g., days 1, 3, etc...) to ensure proper tensioning of the components and stability of the jaw until removal
- Use a needle driver or mosquito forceps for assistance in the procedure
- After removal of device, patient should be switched to a soft diet as soon as possible

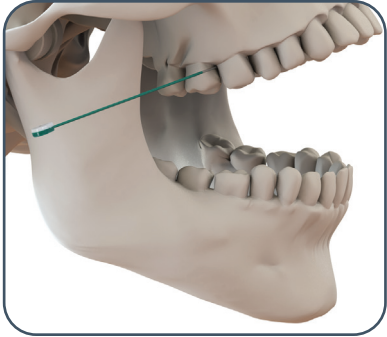
Placement of Minne Ties®



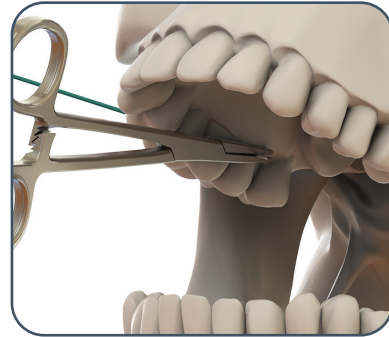
1) Insert cheek retractor.



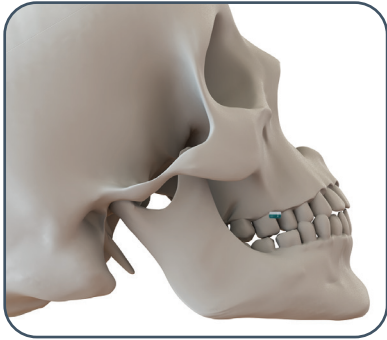
3) Insert introducer, using needle driver, entering maxillary interdental space (embrasure) from the buccal side. Push across the interdental space (embrasure) exiting on the lingual side.



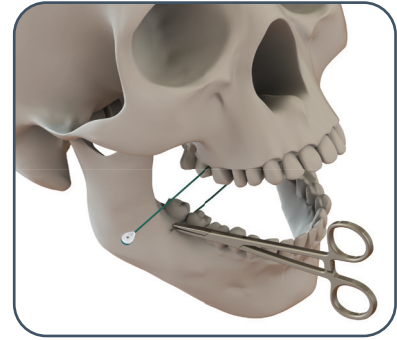
2) Begin with the largest size Minne Tie and downsize if needed. The introducer (i.e., blunt needle) is the sizer. Use the introducer to probe the interdental space (triangular apical embrasure).



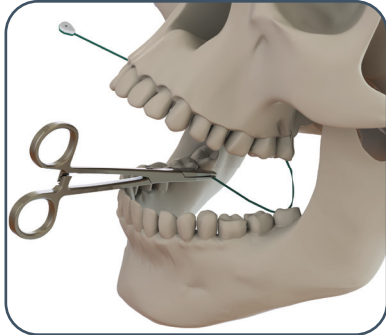
4) Use needle driver to grasp suture on lingual side. Complete interdental space (embrasure) crossing by pulling suture until clasp head is 2.5-5.0 cm (1-2") from teeth.



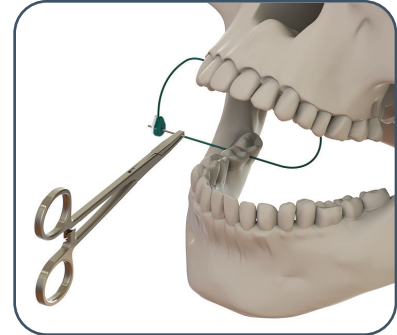
- 5) After placing the tie through the maxilla interdental space (embrasure) place the teeth in occlusion. Confirm that the teeth are lined up vertically before placing tie in the corresponding mandibular interdental space (embrasure).



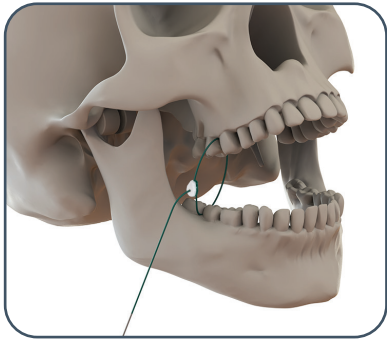
- 7) Pull suture through, ensuring clasp head remains 2.5-5 cm (1-2") from teeth. Maxilla and mandible should remain separated at this point in the procedure.



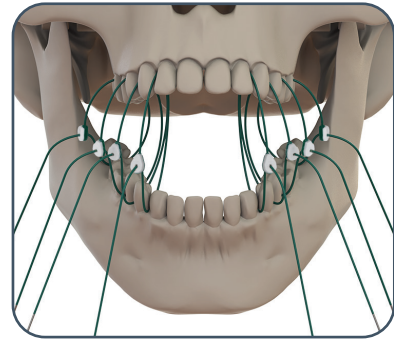
- 6) Advance needle driver to mandible lingual side, push across interdental space (embrasure) exiting on buccal side.



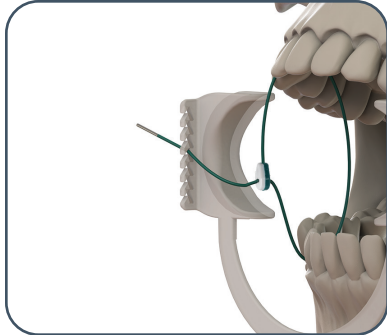
- 8) Using a needle driver advance the introducer through the **GREEN SIDE** of clasp head.



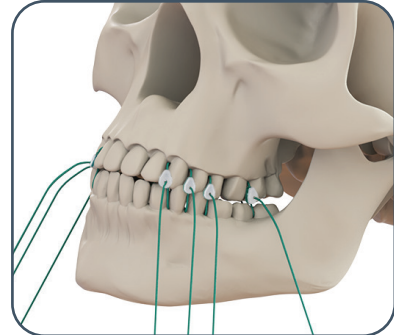
- 9) Tighten to remove slack. (Final tightening occurs after all sutures are placed).



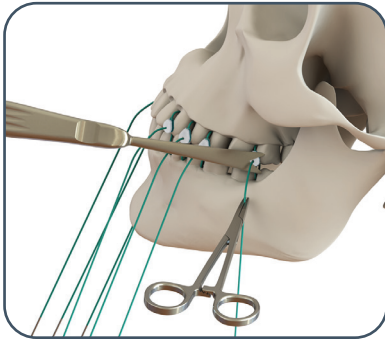
- 11) Once sutures are placed, the dentition should be placed in occlusion. Secure sutures sequentially from anterior to posterior. Cinch inferiorly, which pulls against the typically stable maxilla by pulling on suture.



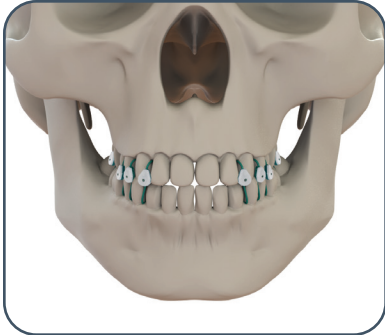
- 10) Cheek retractor slotted sections will hold and help manage the sutures during the procedure.



- 12) To cinch, use a pickle fork (or similar instrument) against the clasp head and pull suture by hand.
Do Not Pull on Introducer.



- 13) For the final tightening, use a pickle fork and forceps (or similar instruments) to cinch the last 2-3 mm (0.08" - 0.12"). **Do Not Pull on Introducer.**



- 14) When MMF and proper occlusion are established and **after final tightening** has occurred, then trim sutures.

DO NOT trim suture flush with clasp head if additional adjustments will be made.

Post-operative

- Regular post-operative examinations are advisable to ensure appropriate tension and proper occlusion
- The Minne Ties MMF Suture System is designed to function for a maximum of 3 weeks
- The patient should be advised to report any unusual changes to the anchorage system to his healthcare professional
- If loosening of the construct occurs before healing is complete, removal and replacement of the Minne Ties may be necessary
- The Minne Ties should be removed if there is any evidence or suspicion of induced movement of teeth or if teeth become sensitive or painful

Precautions










- Adequately instruct the patient about post-operative maintenance. Post-operative care and the patient's ability and willingness to follow instructions are important aspects of successful healing. All potential risks should be discussed with the patient
- Patients should have an effective cutting device (e.g. suture scissors or cuticle scissors) with them at all times in case of airway obstructions (i.e., vomiting)

MRI Information

- MR unsafe 

Caution: Federal Law (USA) restricts this device to be sold by or on the order of a physician, dentist or properly licensed practitioner.

Symbol Reference Key

	Consult instructions for use
	Catalog number
	Use by date
	Lot number
	Sterilize using ethylene oxide
	Do not re-use
	Do not use if package is damaged
	Caution
	MR Unsafe

Not made with natural rubber latex.

US Patent US20140343614A1



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MEDICAL

P: 913.228.1857
Learn more at
MinneTies.com