PATIENT CASE REPORT

The Use of Minne Ties® Anchorage Ties (Dental Occlusion Ties) for elasto-physiotherapy and Maxillomandibular Fixation following TMJ Arthroscopic Surgery

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Maxillomandibular fixation (MMF)) remains a cornerstone in the management of facial trauma, orthognathic surgery, and temporomandibular joint (TMJ) interventions. Established fixation techniques, including ivy loops, arch bars, intermaxillary fixation screws, and hybrid systems all have utility and a role in practice; however, all present limitations in procedural efficiency, surgeon and patient safety, and patient comfort. Traditional Minne Ties® (dental occlusion ties) represent a novel, minimally invasive approach to MMF that combines rapid application and secure occlusal stabilization. Minne Ties Anchorage Ties include a new hook that facilitates the application of elastics. We present our clinical experience with Minne Ties for MMF, and the new Minne Ties Anchorage Ties employed postoperatively with elastic guidance to achieve dynamic mandibular stabilization and support for joint rehabilitation. Postoperative assessment demonstrates stable joint function, improved occlusion, and patient satisfaction with the device, highlighting Minne Ties as an effective adjunct for TMJ surgical recovery.

Maxillomandibular fixation (MMF) continues to be a fundamental technique in the management of facial skeletal injuries and reconstructive procedures. It plays a critical role in the closed management of mandibular fractures, helps maintain correct occlusion during open reduction and internal fixation (ORIF), and supports occlusal relationships throughout orthognathic and temporomandibular joint (TMJ) surgeries[1]. Established fixation methods include Erich arch bars, intermaxillary fixation (IMF) screws, and hybrid systems combining arch bars with bone borne screws, and each technique presents a unique balance of benefits and limitations, including operative efficiency, surgeon and patient safety, and patient comfort[2].

A recent advancement in maxillomandibular fixation technology is the use of dental occlusion ties (commercially referred to as Minne Ties), which resemble intraoral “zip-ties.” Minne Ties are designed to provide strength, durability, and procedural efficiency while enhancing patient safety and comfort. In contrast to conventional fixation systems such as arch bars, wires, and screw-based devices, Minne Ties offer a non-invasive alternative.

The system is composed of medical-grade braided polyester with a blunt introducer tip and a color coded, self-locking clasp featuring smooth, rounded contours. This design facilitates rapid application, minimizes the risk of iatrogenic injury, and improves intraoperative ease of use, thereby serving as a safe and cost-effective option for achieving occlusal stabilization. However, utilization of dental occlusion ties for MMF is not applicable for all patients, including those with compromised occlusion with missing dentition, loose teeth, many open interproximal contacts, comminuted fractures, periodontal disease.

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At MGH, we apply Minne Ties with the "traditional" application method from arch to arch to achieve rigid MMF for appropriate patients when needed (Fig. 1). Typically, cases have included temporary intraoperative MMF for ORIF mandible fractures and other facial fractures, orthognathic cases when orthodontic appliances are not present, and TMJ total joint replacement cases. Minne Ties have also been applied in clinic for closed reduction of minimally displaced mandible fractures. After several weeks, the ties are removed in clinic without sedation or local anesthetic. Patients have tolerated Minne Ties well and endorse pre-morbid occlusion following removal.

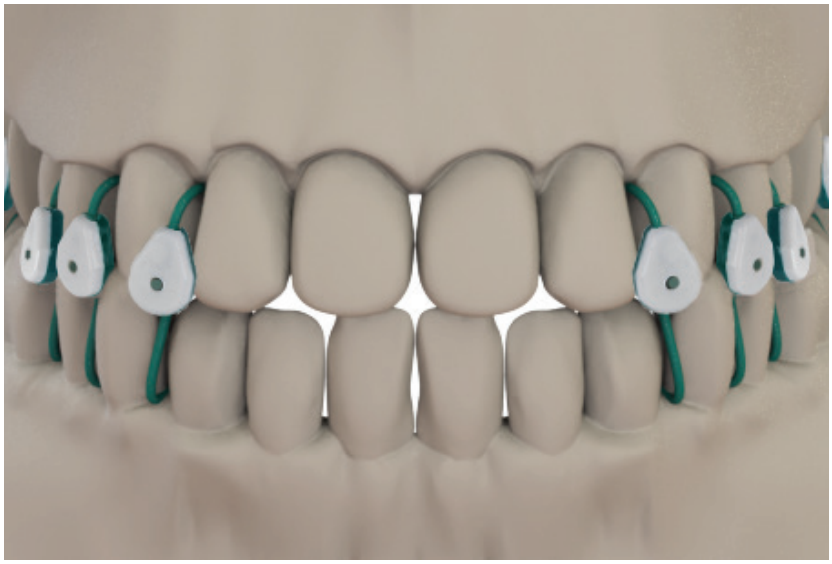
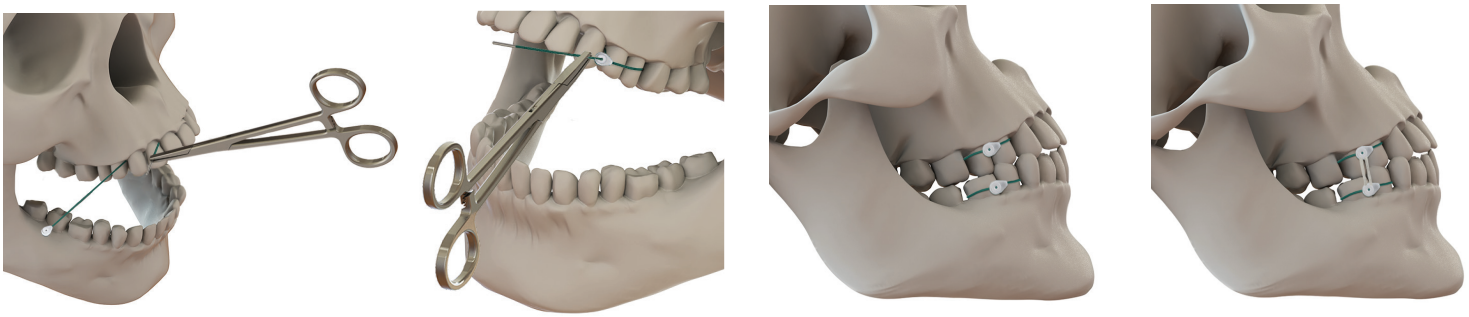


Figure 1. Minne Ties traditional application method for arch to arch fixation. This is the standard Minne Ties product and method for achieving stable MMF.

The utility of MMF techniques extends beyond traditional mandibular stabilization, finding important applications in post-operative elastic physiotherapy following TMJ arthroscopic procedures and TMJ total joint replacement surgery. We have begun to utilize Minne Ties Anchorage Ties to achieve post-operative elastic physiotherapy without the need for additional dental hardware or traditionally invasive intermaxillary fixation techniques.

Application of the Anchorage Ties involves circumdental placement through interdental embrasures. Each tie is typically placed in approximately one minute, which significantly reduces overall fixation time and enhances procedural efficiency in both OR and non-OR settings. Their low-profile design requires minimal intraoral space, thereby improving surgical field visibility and facilitating postoperative oral hygiene.



Placement Anchorage Ties is achieved by advancing the blunt introducer from buccal to lingual through an interdental embrasure and then returning from lingual to buccal around the adjacent or opposing tooth. In our hands, the use of an Ivy loop-like application technique (our preferred technique) has resulted in a strong, stable and durable application. The introducer is subsequently passed through the green, color-coded side of the clasp, permitting a one-way "zip-tie" closure. Excess material may be trimmed with scissors or a scalpel to further reduce intraoral bulk and optimize patient comfort. The addition of a round protrusion on the white side of the clasp functions well as anchorage point for elastics, enabling elasto-physiotherapy. For optimal positioning, the clasp should be aligned over the interdental space rather than directly over a tooth surface.

A 37 year-old female patient recently underwent bilateral Level II temporomandibular joint arthroscopy. Following the procedure, Minne Ties Anchorage Ties were placed bilaterally in the maxillary and mandibular arches, and medium orthodontic elastics were applied to generate a Class II vector pull on the mandible, providing dynamic stabilization during the immediate postoperative period (Fig. 2).

Figure 2. Minne Ties® Application in Operating Room immediately post-completion of joint arthroscopy.

At the one-week follow-up, the patient reported mild dental sensitivity associated with the Minne Ties® on the left side; otherwise, she expressed satisfaction with the arthroscopic intervention and noted improvement in joint pain and function. She continued to adhere to prescribed physical therapy exercises and pharmacologic instructions. Progressive improvement in occlusion was observed with the use of left-side elastics.

Several weeks postoperatively, the Minne Ties were removed (Fig. 3). Examination revealed stable joints and further improvement in occlusion. Follow-up was scheduled at three months postoperatively for consideration of orthodontic support in preparation for orthognathic surgery contingent on occlusal and joint stability.

Figure 3. Intraoral Photographs of Minne Ties® (elastics removed prior to photography). A) Right, B) Left, C) Frontal, D) Smile

This case demonstrates the practical utility of Minne Ties® Anchorage Ties in postoperative TMJ management, providing efficient, non-invasive maxillomandibular fixation while facilitating elasto-physiotherapy. The device allowed for stable occlusal guidance, patient comfort, and adherence to rehabilitation protocols. Minne Ties® may serve as a valuable alternative to traditional MMF methods, particularly in TMJ arthroscopic procedures, offering both surgical and patient-centered advantages. Further studies are warranted to evaluate long-term outcomes and broader applications in complex occlusal and TMJ disorders.

References

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