

TMJ ARTHROSCOPIC LAVAGE

Post-Operative Adjunctive Therapy:

Ostenil (Hyaluronic Acid) and Injectable Platelet-Rich Fibrin (i-PRF)

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1. Overview of TMJ Arthroscopic Lavage

Temporomandibular joint (TMJ) arthroscopic lavage (lysis and lavage) is a well-established minimally invasive surgical procedure performed under general anaesthesia. A fine arthroscope is introduced into the upper joint space of the TMJ to allow direct visualisation of the joint compartment, followed by irrigation with saline or Ringer's solution.

The primary goals of the procedure are to eliminate pro-inflammatory mediators and degradation products from the joint space, disrupt pathological adhesions, re-establish the pressure gradient between the disc and condyle, and restore condylar translation. Success rates in appropriately selected patients are consistently reported at 75–90% for pain reduction and improvement in maximum mouth opening (MMO).

Indications for TMJ Arthroscopic Lavage

- Disc displacement with or without reduction refractory to conservative management
- TMJ osteoarthritis with significant pain and functional limitation
- Internal derangement with restricted mandibular opening (≤ 30 mm)
- Inflammatory arthropathy of the TMJ unresponsive to non-surgical treatment
- Adhesions or hypomobility following prior joint pathology or trauma

2. Rationale for Adjunctive Post-Lavage Injection

Whilst arthroscopic lavage is effective in clearing inflammatory mediators and restoring joint mechanics, the procedure itself can temporarily deplete the joint's natural synovial fluid components — in particular hyaluronic acid — and does not directly address the biological processes of tissue repair and cartilage protection. Two adjunctive injectables are used at the conclusion of the arthroscopic procedure to enhance and prolong the therapeutic benefit:

Ostenil (Hyaluronic Acid)

- Viscosupplementation & joint lubrication
- Chondroprotection and anti-inflammatory action
- Restoration of synovial fluid viscoelasticity
- Reduction of mechanical wear on articular surfaces
- Pain attenuation via receptor-mediated pathways

Injectable Platelet-Rich Fibrin (i-PRF)

- Biological regeneration via autologous growth factors
- Tissue repair and neo-vascularisation
- Anti-inflammatory cytokine modulation
- Stimulation of chondrogenic and fibroblastic activity
- Prolonged pain relief beyond initial post-operative period

3. Ostenil (Sodium Hyaluronate) — In Detail

What is Ostenil?

Ostenil is a purified, high-molecular-weight sodium hyaluronate (1% solution, 2 mL per vial) derived by bacterial fermentation. It is specifically formulated for intra-articular injection and is CE-marked as a medical device for joint disorders. Hyaluronic acid (HA) is a naturally occurring glycosaminoglycan that forms a principal component of healthy synovial fluid and articular cartilage matrix.

Mechanism of Action

- **Viscosupplementation:** HA restores the viscoelastic properties of joint fluid depleted by disease and lavage, reducing friction and mechanical stress on articular surfaces.
- **Chondroprotection:** HA stimulates endogenous HA synthesis by synoviocytes, inhibits degradative enzymes (matrix metalloproteinases), and reduces chondrocyte apoptosis.
- **Anti-inflammatory effects:** HA suppresses prostaglandin synthesis, scavenges free radicals, and inhibits leucocyte migration into the joint space.
- **Analgesia:** HA interacts with nociceptors (including TRPV1 and TRPA1 channels), reducing the sensitivity of pain receptors within the joint capsule.
- **Viscoinduction:** Lower-molecular-weight formulations additionally stimulate the joint's own HA production, creating a longer-lasting regenerative effect beyond the initial injection period.

Administration Protocol

Timing: Injected directly into the superior joint space at the conclusion of the arthroscopic procedure, before trocar removal.

Volume: 1–2 mL (one vial of Ostenil) per joint.

Repeat injections: Where clinically indicated, a further 1–3 outpatient injections may be administered at 2–4 weekly intervals post-operatively.

Benefits of Ostenil Post-Arthroscopy

Clinical Advantages

- Immediately restores joint lubrication depleted by the lavage procedure
- Sustained pain reduction reported up to 6–12 months post-injection
- Improved maximum mouth opening and jaw function
- May reduce the need for repeat surgical intervention
- Excellent safety profile: adverse events are rare and typically mild (transient post-injection soreness)
- Non-immunogenic due to bacterial fermentation origin
- Well-tolerated in the post-operative period; no systemic side effects

4. Injectable Platelet-Rich Fibrin (i-PRF) — In Detail

What is i-PRF?

Injectable Platelet-Rich Fibrin (i-PRF) is a second-generation autologous platelet concentrate derived from the patient's own blood. A small volume (approximately 10 mL) of whole blood is drawn on the day of surgery and centrifuged at low speed (typically 700 rpm for 3 minutes, generating approximately 60 g force) to produce a liquid fibrin matrix rich in platelets, leucocytes, and a broad spectrum of growth factors. Crucially, it contains no exogenous thrombin, anticoagulants, or foreign proteins, making it entirely autologous.

Growth Factors Delivered by i-PRF

Growth Factors Present

- Platelet-Derived Growth Factor (PDGF)
- Transforming Growth Factor- β (TGF- β)
- Vascular Endothelial Growth Factor (VEGF)
- Fibroblast Growth Factor (FGF)
- Insulin-Like Growth Factor (IGF-1)
- Epidermal Growth Factor (EGF)

Biological Effects

- Chondrogenic cell proliferation & differentiation
- Fibroblast activation and collagen synthesis
- Neo-vascularisation and tissue perfusion
- Extracellular matrix remodelling
- Modulation of pro-inflammatory cytokines (IL-1 β , TNF- α)
- Synoviocyte regeneration

Administration Protocol

Preparation: 10 mL venous blood drawn on the day of surgery, centrifuged at 700 rpm for 3 minutes to yield 1–2 mL of i-PRF per sample.

Timing: Injected into the superior joint space at the conclusion of the arthroscopic procedure, either alone or in combination with Ostenil.

Volume: 1–2 mL per joint.

Repeat injections: Additional i-PRF injections may be performed at 4–6 week intervals post-operatively where an augmented regenerative response is desired.

Benefits of i-PRF Post-Arthroscopy

Clinical Advantages

- Entirely autologous: eliminates risk of immunological reaction or disease transmission
- Delivers a concentrated depot of regenerative growth factors directly to the site of joint pathology
- Promotes repair of articular disc, capsule, and condylar cartilage
- Superior sustained analgesia compared to arthrocentesis alone, particularly from 3–12 months
- Significantly reduces TMJ clicking and improves functional outcomes
- Liquid consistency allows precise intra-articular delivery
- No risk of joint cartilage damage associated with corticosteroid use
- Simple, rapid preparation chairside on day of surgery

5. Combining Ostenil and i-PRF

Ostenil and i-PRF exert complementary and synergistic mechanisms of action. Where used together, the hyaluronic acid matrix provided by Ostenil may act as a scaffold that enhances the retention and bioavailability of i-PRF growth factors within the joint space, whilst i-PRF augments the regenerative capacity of the procedure beyond the mechanical and lubricating effects of HA alone. Published data comparing combined HA + PRP/i-PRF versus HA alone suggest a favourable clinical advantage for the combination, particularly with respect to longer-term pain reduction and MMO improvement.

Combined Use: Suggested Clinical Rationale

- Ostenil provides immediate post-lavage lubrication and chondroprotection
- i-PRF provides a sustained biological regenerative stimulus
- Together they address both the mechanical and tissue repair deficits following joint lavage
- May be particularly beneficial in more advanced internal derangement or early osteoarthritis
- Combination may reduce the number of repeat injections required post-operatively

6. Evidence Summary

The evidence base for both Ostenil (HA) and i-PRF following TMJ arthrocentesis and arthroscopy has grown substantially over the past decade, with an increasing number of RCTs and systematic reviews providing moderate-quality evidence supporting their use. Key studies are summarised below.

Study / Authors	Study Type	Intervention	Key Finding
Castañó-Joaqui et al. (2021)	RCT (12-month)	HA (Ostenil) post-arthroscopy	Improved pain & MMO at 3 months; results comparable to arthroscopy alone at 12 months

Study / Authors	Study Type	Intervention	Key Finding
Chęciński et al. (2023)	Systematic Review / RCT comparison	HA vs arthroscopy for disc displacement	Both HA injections and arthroscopic lavage effective and safe
Kukreja et al. (2024)	Systematic Review / Meta-analysis	HA for TMD across multiple studies	HA improved pain, MMO and joint sounds vs control group
Castaño-Joaqui et al. (ScienceDirect 2024)	SR & Meta-analysis RCTs	Arthrocentesis + HA/PRF/PRP vs arthrocentesis alone	Moderate-certainty evidence of benefit for pain & MMO at multiple follow-up intervals
Araújo et al. (Oral Diseases 2024/2025)	Systematic Review & Meta-analysis	i-PRF alone or combined with arthrocentesis/arthroscopy	i-PRF superior to controls for pain reduction; sustained analgesic effects to 12 months
Nemeth et al. (BMC Oral Health, 2025)	Systematic Review & Meta-analysis	i-PRF for TMJ-ID and TMJ-OA (6 RCTs, 270 patients)	Significant pain reduction (SMD -2.16; 95% CI -3.43 to -0.89; P<0.001)
Kumar et al. (Cureus, 2024)	Prospective RCT (68 patients, 24-week)	i-PRF injections vs placebo for TMJ pain	Significant sustained reduction in pain & improved jaw function (p<0.001)
Sielski et al. (J Clin Med, 2023)	Scoping Review (8 studies, 5 RCTs)	I-PRF in TMJ cavities post-arthrocentesis	Effective in reducing pain & improving MMO; 1–2 mL per joint protocol well-tolerated

Overall, the evidence supports the use of both intra-articular HA (Ostenil) and i-PRF as safe and effective adjuncts to TMJ arthroscopic lavage, with moderate certainty of evidence (GRADE) for improvements in pain (VAS) and maximum mouth opening. The most robust evidence for i-PRF comes from the 2025 meta-analysis by Nemeth et al. (BMC Oral Health), which demonstrated a statistically significant and clinically meaningful reduction in pain across 270 patients from 6 RCTs.

7. Safety and Contraindications

Ostenil — Safety Profile

- Generally very well tolerated; adverse events are rare
- Mild transient post-injection pain or swelling may occur, resolving within 24–48 hours
- No systemic adverse effects reported in the literature
- Contraindicated in active joint infection or known hypersensitivity to hyaluronate preparations

i-PRF — Safety Profile

- Entirely autologous: no risk of allergy, immunological reaction or transmitted infection
- No serious adverse events reported in published clinical trials
- Contraindicated in patients with platelet disorders, anticoagulant therapy, or active haematological malignancy
- Requires venepuncture on the day of surgery (approximately 10 mL blood required)

8. Patient Information Summary

The following key points can be shared with patients when discussing post-arthroscopy adjunctive therapy:

For Patients: What to Expect

- At the end of your TMJ keyhole surgery, an injection will be placed into the joint space to promote healing and reduce pain
- If Ostenil is used: this is a gel-like substance similar to the natural fluid in your joint — it helps lubricate and protect the joint as it heals
- If i-PRF is used: this is made from a small sample of your own blood taken on the day of surgery, processed to concentrate healing growth factors
- Both treatments are safe, minimally invasive, and well-supported by clinical evidence
- You may experience some mild soreness around the joint for 24–48 hours after the injection — this is normal and temporary
- The beneficial effects typically develop over 4–8 weeks and may last 6–12 months or longer
- Further injections can be arranged in clinic if needed

9. References

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