



Editorial

A brief critical appraisal on reported complications for temporomandibular joint arthroscopy

Breve evaluación crítica sobre las complicaciones publicadas para la artroscopia de la articulación temporomandibular

We could define internal derangement (ID) of the temporomandibular joint (TMJ) as a condition in which there is an abnormal relation between the mandibular condyle, the articular eminence and the disc interposed among them, leading to articular pain, disturbances of mandibular function and joint noises. Among therapeutic approaches, a previous systematic review (SR) and meta-analysis by Al-Moraissi et al.¹ showed that arthroscopy had better results than arthrocentesis and conservative treatment in terms of increasing mouth opening and decreasing pain for TMJ ID, with minimal complication rates. Its range-heat graphical analysis shows the degree of improvement in terms of pain and function for different therapeutic approaches, including arthroscopy, open surgery, arthrocentesis, and conservative treatment. For both ID and osteoarthritis (OA) of the TMJ, the best results were obtained with arthroscopy (alone or in combination with hyaluronic acid [HA] or platelet-rich plasma [PRP]). Moderate results were obtained for open surgery and arthrocentesis (alone or combined with HA or PRP or corticosteroids [CS]). The worst results were observed with conservative treatment, occlusal splints, physiotherapy and placebo.

In the recent meeting of the European Society of TMJ Surgeons (ESTMJS) held at Oxford in March 2023, we had the opportunity to evaluate complication rates among available literature concerning with TMJ arthroscopy. We selected 16 studies according to strict inclusion criteria through a critical appraisal (unpublished results). The estimated potential risk of bias was high in 15 studies¹⁻¹⁵ and moderate in one¹⁶. There were not any studies with an overall low potential risk of bias, probably due to the absence of randomized controlled trials (RCTs) or controlled trials (CTs) reporting complications in arthroscopy of the TMJ for the treatment of ID.

In general, larger series reported lower complication rates, such as the series by McCain et al.¹ (4.01 % in 4,831 joints), Carls et al.² (1.77 % in 451 joints), González-García et al.⁴ (1.34 % in 670 joints), Chen et al.¹³ (0.95 % in 419 joints), and Zhang et al.⁵ (0.7 % in 2,431 joints). Smaller series reported higher complication rates, such as those by Weinberg et al.¹⁵ (29.6 % in 30 joints), Chowdhury et al.¹⁴ (20 % in 50 joints), Angelo et al.¹⁶ (34.15 % in 82 joints), and Anish Poorna et al.⁸ (46 % in 50 joints). Intermediate complication rates were reported for Silva et al.¹¹ (7.9 % in 138 joints), Fernández-Sanromán et al.⁶ (8.21 % in 475 joints), Haeffs et al.¹² (14.9 % in 247 joints), and Tsuyama et al.³ (10.3 % in 301 joints). After further analysis, we could observe that there was a risk of underestimation in the number of reported complications in most of the included studies, since they lacked of double-blind evaluation, while monitoring and recording of complications were frequently carried out by the same surgeon.

Most relevant observed complications were the following ones:

1. **Edema of surrounding soft tissues, including parapharyngeal, soft palate and/or preauricular edema.** It was reported to occur in 8 studies, with reported complication rates ranging from 0.22% to 17.9% in 2,274 operated joints^{2,6-11,16}, which is relevant to illustrate that this complication is not extremely uncommon in many series (Figure 1).

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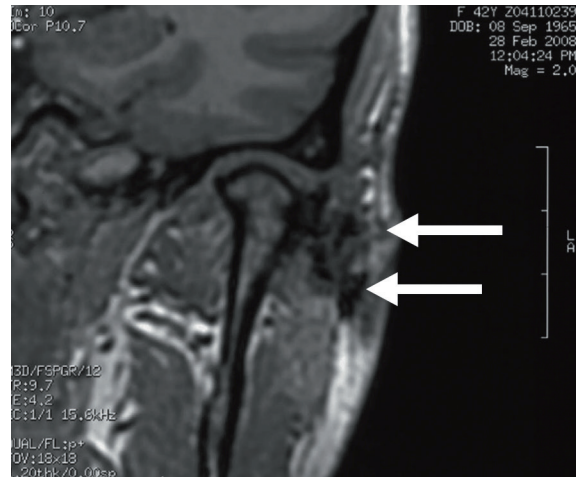


Figure 1. Edema and inflammation of preauricular superficial and deep soft tissues due to multiple puncture attempts during the arthroscopic procedure. Picture courtesy of Dr. F. Monje. Hospital Universitario de Badajoz. Badajoz, España.

2. **Temporary nerve paresis.** It was reported to occur ranging from 0.21 % to 0.7 % in the largest series^{1-4,6,11}, comprising 6,866 operated joints. It is interesting to note that neurologic lesions were much higher in smaller series, increasing up to 8.5-23 % for 5th nerve deficit and up to 1.37-10 % for 7th nerve paresis, in contrast to only 0.15-2.38 % for 5th nerve deficit and 0.21-0.7 % for 7th nerve paresis in larger series.
3. **Laceration of the EAC.** It was reported to appear in 8 studies comprising 2,665 operated joints, with complication rates ranging from 0.3 % to 6 %^{3,4,6-8,11,14,16}. When the 7 articles dealing with EAC were addressed individually, the complication rate varied from 0.3 % to 6 %, in 1,766 operated joints, which shows some heterogeneity, from its appearance as a very rare event to its presence in more than 1 in 20 cases.
4. **Bleeding.** *Intra-articular bleeding* was reported in 212 cases out of 3,994 operated joints from 7 studies^{4-8,14,16}, with reported complication rates ranging from 0.2 % to 13.57 %. *Extra-articular bleeding* occurred in 19 out of 657 operated joints from 4 studies^{6,8,14,16}, ranging from 3.5 % to 6.1 %.

Complication rates for TMJ arthroscopic procedures have been reported inconsistently, and a significant number of publications are isolated case reports reporting extremely rare isolated complications (Figure 2). Despite this, we have a small number of large clinical series with an appropriate recording of complications. The best available literature reporting complication rates following arthroscopy in patients with TMJ ID shows a high estimated potential risk of bias due to inherent design of most studies, which makes it necessary to increase the available evidence through the design of controlled clinical trials (CCTs). Meanwhile, recommendation for patients regarding complications in informed consents must be based on reported rates by clinical series of cases and critical appraisal reviews, such as the preliminary results reported in this editorial. We can conclude from our

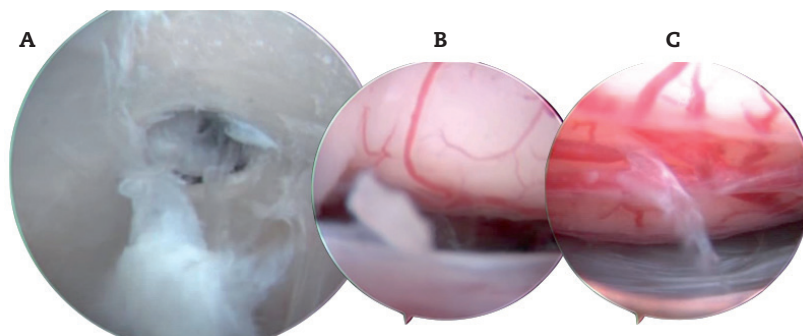


Figure 2. Perforation of the middle cranial fossa. A: hole into the temporalis fossa within the upper joint space of the TMJ. B and C: view of the temporal lobe of the brain within the middle cranial fossa. Pictures courtesy of Dr. FJ. Rodríguez Campo. Hospital Universitario de La Princesa. Madrid, España.

analysis of the available literature that, with a global complication rate of 7.75 % among more than 11,000 operated joints (most of them temporary), arthroscopy is a highly safe procedure for the treatment of TMJ ID.

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REFERENCES

- McCain JP, Sanders B, Koslin MG, Quinn JD, Peters PB, Indresano T. Temporomandibular joint arthroscopy: a 6-year multicenter retrospective study of 4,831 joints. *J Oral Maxillofac Surg.* 1992;50(9):926-30. DOI: 10.1016/0278-2391(92)90047-4.
- Carls FR, Engelke W, Locker MC, Sailer HF. Complications following arthroscopy of the temporomandibular joint: Analysis covering a 10-year period (451 arthroscopies). *J Craniomaxillofac Surg.* 1996;24(1):12-5. DOI: 10.1016/s1010-5182(96)80071-0.
- Tsuyama M, Kondoh T, Seto K, Fukuda J. Complications of temporomandibular joint arthroscopy: a retrospective analysis of 301 lysis and lavage procedures performed using the triangulation technique. *J Oral Maxillofac Surg.* 2000;58(5):500-5. DOI: 10.1016/s0278-2391(00)90010-7.
- González-García R, Rodríguez-Campo FJ, Escorial-Hernández V, Muñoz-Guerra MF, Sastre-Pérez J, Naval-Mías L, et al. Complications of temporomandibular joint arthroscopy: a retrospective analytic. Study of 670 arthroscopic procedures. *J Oral Maxillofac Surg.* 2006;64(11):1587-91. DOI: 10.1016/j.joms.2005.12.058.
- Zhang Z, Yang C, Cai X, Liu X, Huang D, Xie Q, et al. Prevention and treatment for the rare complications of arthroscopic surgery in the temporomandibular joint. *J Oral Maxillofac Surg.* 2011;69(11):e347-53. DOI: 10.1016/j.joms.2011.03.062.
- Fernández-Sanromán J, Costas López A, Fernández-Ferro M, de Sánchez AL, Stavaru B, Arenaz Bua J. Complications of temporomandibular joint arthroscopy using two-portal coblation technologies: A prospective study of 475 procedures. *J Craniomaxillofac Surg.* 2016;44(9):1221-5. DOI: 10.1016/j.jcms.2016.06.027.
- González LV, López JP, Díaz-Báez D, Martín-Granizo López R. Intraoperative complications in temporomandibular joint arthroscopy: A retrospective observational analysis of 899 arthroscopies. *J Craniomaxillofac Surg.* 2022;50(8):651-6. DOI: 10.1016/j.jcms.2022.06.011.
- T AP, Ek J, John B, Pg A, S M, Abraham AA. Complications of arthroscopic lysis and lavage in internal derangement of the temporomandibular joint - A single institutional experience with review of literature. *J Stomatol Oral Maxillofac Surg.* 2022;123(6):691-6. DOI: 10.1016/j.jormas.2022.06.024.
- Abboud WA, Givol N, Yahalom R. Arthroscopic lysis and lavage for internal derangement of the temporomandibular joint. *Ann Maxillofac Surg.* 2015;5(2):158-62. DOI: 10.4103/2231-0746.175754.
- Indresano AT. Arthroscopic surgery of the temporomandibular joint: report of 64 patients with long-term follow-up. *J Oral Maxillofac Surg.* 1989;47(5):439-41. DOI: 10.1016/0278-2391(89)90274-7.
- Silva PA, Lopes MT, Freire FS. A prospective study of 138 arthroscopies of the temporomandibular joint. *Braz J Otorhinolaryngol.* 2015;81(4):352-7. DOI: 10.1016/j.bjorl.2014.08.021.
- Haefls TH, D'Amato LN, Khawaja SN, Keith DA, Scrivani SJ. What Variables Are Associated With the Outcome of Arthroscopic Lysis and Lavage Surgery for Internal Derangement of the Temporomandibular Joint? *J Oral Maxillofac Surg.* 2018;76(10):2081-8. DOI: 10.1016/j.joms.2018.04.018.
- Chen MJ, Yang C, Zhang SY, Cai XY. Use of Coblation in arthroscopic surgery of the temporomandibular joint. *J Oral Maxillofac Surg.* 2010;68(9):2085-91. DOI: 10.1016/j.joms.2009.04.130.
- Chowdhury SKR, Saxena V, Rajkumar K, Shadamarshan RA. Complications of Diagnostic TMJ Arthroscopy: An Institutional Study. *J Maxillofac Oral Surg.* 2019;18(4):531-5. DOI: 10.1007/s12663-019-01202-3.
- Weinberg S, Kryshchalskyj B. Analysis of facial and trigeminal nerve function after arthroscopic surgery of the temporomandibular joint. *J Oral Maxillofac Surg.* 1996;54(1):40-3. DOI: 10.1016/s0278-2391(96)90301-8.
- Ângelo DF, Araújo RAD, Sanz D. Surgical complications related to temporomandibular joint arthroscopy: a prospective analysis of 39 single-portal versus 43 double-portal procedures. *Int J Oral Maxillofac Surg.* 2021;50(8):1089-94. DOI: 10.1016/j.ijom.2020.07.020.