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Viscosupplementation compared to arthrocentesis in the management of disc displacement without reduction: a systematic review

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Marta de Cássia Silva Lopes[1], Luiza Sana de Souza[1], Olga Dumont Flecha[2], José Cristiano Ramos Glória[2], Karine Taís Aguiar Tavano[1], Brender Leonan-Silva[2*]

[1] Department of Dentistry of the Universidade Federal dos Vales do Jequitinhonha e Mucuri (UFVJM), Diamantina, Brazil

[2] Posgraduate Program of Dentistry of the Universidade Federal dos Vales do Jequitinhonha e Mucuri (UFVJM), Diamantina, Brazil

*Correspondence: Brender Leonan-Silva, Postgraduate Program in Dentistry - Universidade Federal dos Vales do Jequitinhonha e Mucuri – UFVJM, Rua da Glória, 187 - Diamantina - MG – Brazil, Postal Code: 39100-000. Telephone number: 55-38 991263533, email: brender.leonan@ufvjm.edu.br

Keywords

Temporomandibular dysfunction, Disc displacement, Arthrocentesis, Viscosupplementation, Hyaluronic acid

Abstract

The aim of this study was to compare the efficacy of viscosupplementation and arthrocentesis in the management of patients with disc displacement without reduction (DDwR). This review critically analysed randomized clinical trials, following PRISMA guidelines and with a protocol registered in PROSPERO (CRD42025650126). A comprehensive search was carried out in PubMed, Scopus, Web of Science, Cochrane, Embase, and Google Scholar. The PICOS framework guided the inclusion criteria, considering Population, Intervention, Comparator, Outcome, and Study design. Keywords such as "Temporomandibular Joint Dysfunction Syndrome", "Temporomandibular Joint", "Temporomandibular Joint Disc", "Arthrocentesis", and "Viscosupplementation" were used, individually and in combination. After screening and applying eligibility criteria, five study articles were included and assessed for risk of bias, level of evidence, and reported clinical outcomes. Both techniques were efficacious in controlling pain and improving the range of jaw opening. Arthrocentesis alone showed satisfactory results, but its association with viscosupplementation, especially with the use of Hyaluronic Acid (HA) or Injectable Platelet Rich Plasma (I-PRF), enhanced clinical effects. The choice of material for viscosupplementation appeared to have a direct impact on clinical outcomes. However, most of the study articles evaluated presented a high risk of bias, demonstrating the need for further research with greater methodological rigor for the scientific consolidation of these protocols. Although arthrocentesis remains a well-established management approach, viscosupplementation has emerged as a promising alternative, especially when combined with biomaterials, offering potential for improving patient outcomes in clinical practice.

Introduction

Disc displacement without reduction (DDwR) is a condition in which the articular disk of the Temporomandibular Joint (TMJ) is unable to return to its physiological place when the mouth is opened, making it impossible for the condylo-maxillary complex to move completely (1). DDwR is part of the Temporomandibular Dysfunctions (TMD) group, with a constantly increasing prevalence rate. In addition, because it is an anomaly that may or may not cause pain, rates may be underreported (2).

DDwR can be managed in different ways depending on the severity and duration of the condition. In mild cases, watchful waiting may be sufficient, allowing symptoms to resolve naturally. Conservative management includes medications to relieve pain or inflammation, manual therapy, and joint exercises aimed at improving jaw function and reducing discomfort. In cases of acute DDwR—of recent onset and short duration—the initial approach should focus on recapturing the disc through mandibular manipulation, particularly in patients experiencing their first episode of joint locking, when the disc and surrounding tissues have not yet undergone significant morphological changes. In chronic cases, the likelihood of successfully repositioning the disc decreases due to reduced tissue elasticity and disc deformity resulting from the long duration of the condition (3). Overall, there are multiple management approaches for DDwR. These range from conservative strategies, such as medications, manual manipulation, joint physiotherapy, arthrocentesis, and viscosupplementation, to more invasive procedures, including surgical interventions performed in a hospital setting (4).

Arthrocentesis, first described by Nitzan et al. in 1991 (5), consists of irrigating the superior-posterior compartment of the TMJ to expand the joint space, release adhesions, and eliminate local inflammatory mediators, ultimately improving joint function (5,6). Although initially indicated for degenerative joint disorders—drawing from orthopedic principles—arthrocentesis has since been applied to a variety of TMJ conditions, including joint sounds, restricted jaw opening, DDwR, and the anchored disc phenomenon (7). Clinical studies have reported that this minimally invasive technique reduces pain, enhances mandibular mobility, and improves masticatory efficiency in symptomatic patients (6). Arthrocentesis can be performed using a double-needle technique—where one needle introduces the irrigating solution while the other allows drainage of intra-articular contents—or a single-needle approach, in which both inflow and outflow occur through the same entry point (8,9).

Viscosupplementation (VS) of the TMJ is a minimally invasive procedure consisting of the intra-articular injection of sodium hyaluronate (SH) and Hyaluronic Acid (HA) into the joint compartments (10). Research indicates that infiltration with HS and HA into the joint promotes lubrication of the joint surfaces, reduction of friction in the affected synovial cavities and prevention of adhesions. It also has a metabolic action that helps to nourish the disc and the joint complex (11). It is considered an effective therapy for promoting joint homeostasis and analgesia by stimulating type B synoviocytes to produce additional synovial fluid, which results in improvements in the rheological properties of the synovial fluid, superior lubrication, absorption of functional loads and stimulation of chondrocyte proliferation in the fibrocartilage (10).

In an in vivo study, Januzzi et al. found that in the application of VS to the TMJ, the best results in pain reduction, increased maximum mouth opening and structural gains are achieved when both the upper and lower compartments are treated. At the same time, they also suggest that access to the lower compartment is a very difficult procedure due to the small size of this compartment and the lack of an effective method that can be reproduced (10).

Thus, arthrocentesis and viscosupplementation are shown to be approaches that help reduce symptoms and promote the long-term well-being of patients with this dysfunction (12). However, the literature still lacks consensus regarding the most efficacious management strategy for DDwR, as well as the ideal material for these procedures (13,14). Therefore, this study aims to compare the efficacy of viscosupplementation and arthrocentesis in the management of patients with DDwR, through a critical review of randomized clinical trials.

Materials and methods

Protocol and registration

This review was developed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (15) and registered in the International Prospective Register of

Systematic Reviews (PROSPERO), with the registration code CRD42025650126.

Search strategy and eligibility criteria

The search was based on the PICOS strategy, with the following items: Population (Patients with DDwR), Intervention (Viscosupplementation), Comparator (Arthrocentesis), Outcome (Pain and jaw opening) and Study/Type of study (Randomized Clinical Trials or not). Based on this, the following question was established: "Is viscosupplementation more efficacious than arthrocentesis in the management of DDwR?". The review included articles published between 2019 and 2025, with no language restrictions applied. This time frame was chosen to capture the most recent and relevant evidence while ensuring a comprehensive overview of the available literature.

Databases and descriptors

The databases used for this study were PubMed (via Medline), Scopus, Web of Science, Cochrane and Embase. A search was also made for the first 100 references in gray literature (Google Scholar). The descriptors used for the search were obtained from the Medical Subject Headings (MeSH) platform, and were “Temporomandibular Joint Dysfunction Syndrome”, “Temporomandibular Joint”, “Temporomandibular Joint Disc”, ‘Arthrocentesis’ and “Viscosupplementation”, combined or not (Supplementary File 1).

Study articles selection

The entire process of searching, selecting studies and collecting data was carried out by two independent researchers (MCSL and LSS) and any discrepancies were resolved with a third reviewer (BLS). After the electronic search, the references were exported to the Rayyan Systematic Review reference organizer (https://new.rayyan.ai/). Duplicates were excluded and the references were screened using the titles and abstracts. The selected study articles were then read in full and assessed according to the research eligibility criteria.

Data collection, extraction and risk of bias assessment

A detailed analysis of the articles included in the study was carried out, considering the individual aspects of each article (author, year of publication, study design, sample size, objectives, interventions, results and conclusion). To analyse the quality of evidence of each study articles, a framework was structured according to the Consolidated Standards of Reporting Trials (CONSORT) 2010 (16) adapted from He et al. (17), with criteria established to qualify the methodology and classify the levels of evidence and risk of bias of each study.

The criteria assessed to specify the level of evidence and risk of bias were sample calculation, randomization, allocation concealment, blinding and losses to follow-up, adapted from He et al. (17) and Leonan-Silva et al. (18). The scores and justifications assigned according to the evaluation of the study articles are shown in Table 1.

The result regarding the risk of bias and level of evidence of each study articles was determined from the lowest score obtained among the criteria evaluated.

Table 1. Criteria used to assess the risk of bias.

Authors / Year of Publication	Sample Calculation	Randomization	Allocation concealment	Blinding / masking	Losses in follow-up	LE
Order by publication date	A Adequate. Presents the sample calculation or mentions another article with the reference.	A Adequate. Mention randomization and strategy.	A Adequate. Explain how the intervention was carried out and when it was revealed.	A Adequate. Triple or double-blind. Explanations of who was blinded.	A Adequate. Reports including numbers and causes. Losses foreseen in the sample calculation and how they were dealt with. Should not exceed 10%.	I
	B Partially reported, confusing, mentions another article without citing the reference.	B It mentions but does not describe the strategy.	B It mentions but does not describe the moment of revelation. Confusing, not clear.	B Double-blind or single-blind, without explanations or unclear.	B It partially reports the losses. Does not explain numbers and causes.	II
	C Not reported or inadequate.	C No mention or inadequate (date of birth, case registration number).	C No mention. Clearly inadequate.	C No mention. Open trial, not masked.	C Not reported.	III

Font: Criteria adapted from He et al. (15) and Leonan-Silva et al. (16). **Abbreviations**: LE = Level of Evidence.

Results

In the initial search, 892 study articles were identified, 640 of which progressed to the next stage after duplicates were removed. Of these, 600 were excluded after reading the title and abstract. Of the 40 articles selected for reading in full, 2 were excluded due to the impossibility of accessing the file in full and difficulty in contacting the authors. After reading the study articles in full, 24 were excluded because they did not present a precise diagnosis of the patient's dysfunction and 10 because they used therapeutic approaches not associated with the protocol. As a result, 5 RCTs were included to assess the risk of bias, 1 of which was obtained by searching the gray literature (Figure 1).

A summary of the data from each article included in this review can be found in Table 2. The classification of the risk of bias, following the 5 evaluation criteria, can be seen in Table 3.

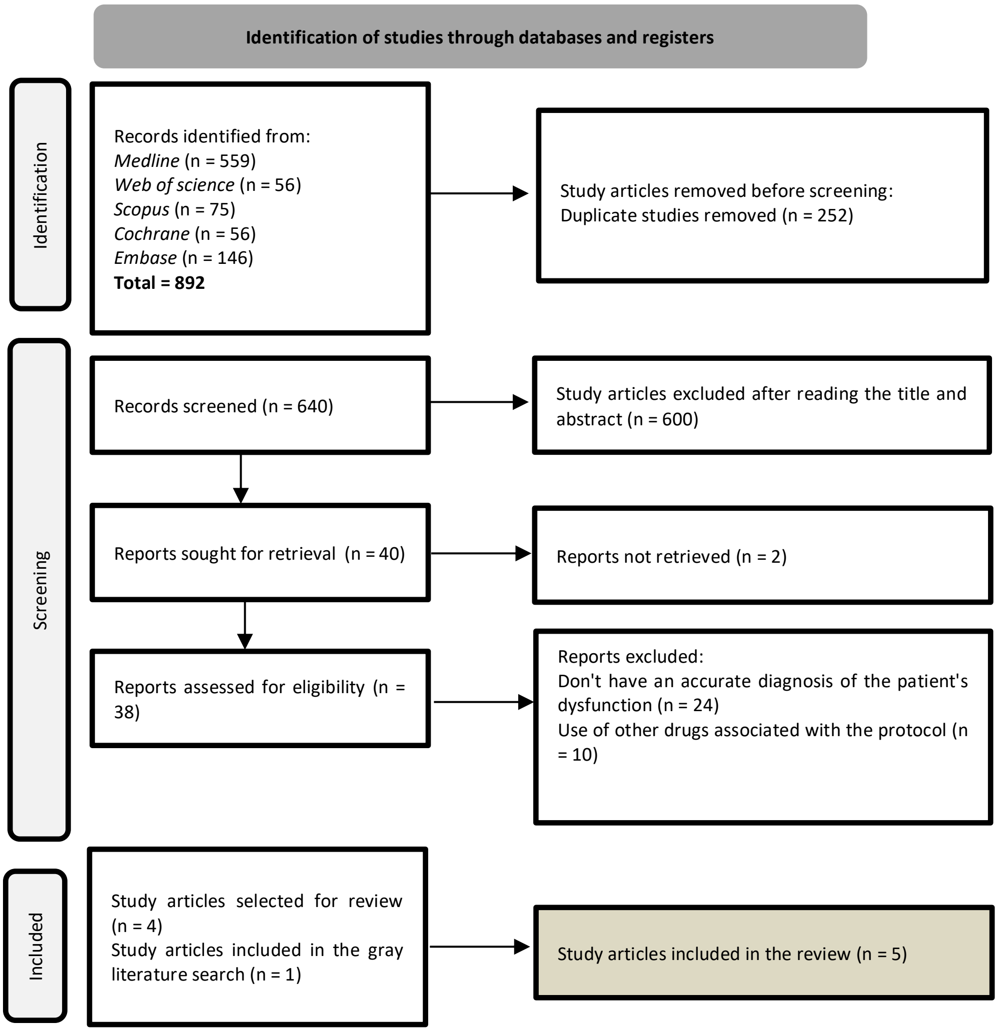

Figure 1. Flowchart of study selection.

Table 2. Summary of data.

Author (year of publication) Type of study	Sample	Aims	Interventions	Assessment criteria	Results and conclusion
Toameh et al. (2019) (19) RCT	30 patients	Investigating the effectiveness of 3 techniques in the management of DDwR	G1: AC (LRS) G2: AC (LRS) + VS (HA) G3: AC + VS (i-PRP) 2-needle technique	JO, pain and chewing efficiency by VAS (0-10)	The increase in JO in G2 and G3 was significantly greater than in G1 Pain intensity and masticatory efficiency were better in G3 than in G1 and G2
Yilmaz et al. (2019) (20) RCT	90 patients	Comparing the efficacy of AC alone or combined with HA injection	G1: AC (SS) + HA G2: VS (HA) G3: AC single-needle technique	VAS pain (0- 10) and JO	G1 and G2 were effective in relieving pain. However, G1 stood out in terms of quality of life and JO
Rajput et al. (2020) (21) RCT	24 patients	Comparing the effectiveness of VS with i-PRP and AC	G1: AC (LRS) 2-needle technique G2: VS (i-PRP)	VAS pain (0- 10) and JO	There were significant results in both groups, but AC was superior in all the evaluation criteria
Ramakrishnan et al. (2022) (22) RCT	33 patients	Comparing the efficacy of VS with i-PRP in patients with DDwR	G1: AC (LRS) + VS (I-PRP) G2: AC (LRS) + VS (SH) G3: AC (LRS) 2-needle technique	VAS pain (0- 10) and JO	There was a reduction in pain and an increase in JO, with AC + I-PRP being more effective than the other interventions
Işık et al. (2023) (23) RCT	76 patients	Compare clinical results of VS with i-PRF after AC with AC alone	G1: AC (SS) + VS (I-PRF) G2: AC (SS) 2-needle technique	VAS pain (0- 10) and JO	The percentage of patients who met the success criteria was 73.7% for the AC group and 100% for the AC+i-PRF group

Font: Adapted from He et al. [15] and Leonan-Silva et al. [16]. **Abbreviations**: AC = Arthrocentesis; DDwR: Disk Dislocation Without Reduction; HA = Hyaluronic Acid; i-PRF: Injectable Platelet Rich Fibrin; i-PRP: Injectable Platelet Rich Plasma; JO: Jaw Opening; LRS: Lactated Ringer's Solution; RCT: Randomized Clinical Trial; SH = Sodium Hyaluronate; SS: Saline Solution; VAS: Visual Analog Scale; VS: Viscosupplementation.

Table 3. Classification of the level of evidence.

Author/ year of publication	Sample calculation	Randomization	Allocation concealment	Blinding/ masking	Losses in follow-up	LE
Toameh et al. (2019) (19)	A	B	C	C	A	III
Yilmaz et al. (2019) (20)	C	A	A	A	A	III
Rajput et al. (2020) (21)	C	B	C	C	A	III
Ramakrishnan et al. (2022) (22)	C	B	C	C	A	III
Işık et al. (2023) (23)	A	A	A	A	A	I

Font: Criteria adapted from He et al. (15) and Leonan-Silva et al. (16). **Abbreviations**: LE = Level of Evidence.

Discussion

Due to its multifactorial nature, DDwR can be managed in a variety of ways, with the complexity of each approach varying accordingly. When selecting a management strategy for a patient, factors such as procedure invasiveness and expected recovery time are carefully considered (4). If conservative approaches are insufficient, minimally invasive procedures such as arthrocentesis or viscosupplementation may be employed to relieve pain and improve jaw opening (24). These techniques do not reposition the articular disc itself; rather, they facilitate smoother translation within the superior joint compartment and contribute to improved mandibular range of motion (7).

For chronic or persistent cases, particularly when pain persists or joint function remains significantly limited despite non-surgical interventions, surgical management may be necessary (4). Examples include patients with long-standing disc displacement, significant disc deformity, or persistent joint locking that impairs daily function. Surgery is generally considered only after all non-surgical strategies have been attempted, and careful patient selection is essential to achieve favorable outcomes.

The DDwR affects not only the TMJ and surrounding tissues, but also individuals' quality of life. In this case, the choice of Arthrocentesis (AC) and Viscosupplementation (VS) as therapeutic approaches is in line with the First Brazilian Consensus on Temporomandibular Dysfunction and Orofacial Pain (2010), which assures that minimally invasive procedures are not only safe, but also effective in treating these dysfunctions (25). Several high-quality evidence articles emphasize that the success of AC and VCS in managing DDwR depends on their combination with adjunctive therapies aimed at controlling the patient’s overall condition. These may include occlusal splints, a soft diet, physiotherapy, and the elimination of premature occlusal contacts all intended to reduce functional overload on the TMJ (7,26,27).

Arthrocentesis is an intervention that has long been applied in the field of TMD for the management of degenerative joint diseases (28). It has been demonstrated in articles providing high-level evidence to be effective in relieving symptoms associated with closed lock, provided that the diagnosis is accurate and the procedure is properly applied (5,29). There are also reports of its benefits in reducing the increased intrinsic load on the joint, promoting revitalization of the joint lubrication system, and serving as a valuable diagnostic tool (7). Regarding the arthrocentesis technique, four of the included study articles employed the two-needle approach (19,21-23), while only one article (20) used the single-needle technique as proposed by Guarda-Nardini et al. (8). Although comparative articles have not demonstrated statistically significant differences in clinical outcomes between the two approaches, researchers have reported advantages associated with the single-needle technique, including greater patient comfort and tolerance, reduced clinical time, and more stable access to the joint compartment (8,9,30).

When clinical efficacy of these management approaches was assessed, the isolated use of AC, compared with VS, was found to be more efficacious in reducing pain, as measured by the visual analog scale, and in increasing jaw opening (21). However, its effects can be enhanced when combined with VS, whether with Hyaluronic Acid (HA) (20), Injectable Platelet Rich Plasma (i-PRP) (19,22) and Injectable Platelet Rich Fibrin (i-PRF) (23).

Viscosupplementation associated with Injectable Platelet Rich Fibrin (i-PRF) and HA, although more recent than arthrocentesis, has shown significant and promising results in the management of DDwR, since in addition to improving pain, it favours the return of normal joint activities and stimulates the production of synovial fluid (23). The i-PRF, a concentrated solution of platelets found in plasma, containing growth factors, has been widely used. These platelets release proteins that play an essential role in tissue regeneration and healing (31), which often favours their choice for viscosupplementation.

In addition, regarding viscosupplementation, it is worth remembering that the result obtained by this procedure can often be directly linked to the material used during it. This is because some materials, such as HA, encourage the production of synovial fluid by the condylar complex, a property that is not attributed to other materials such as i-PRF (32).

Another RCT, rigorously conducted, performed VS with dextrose injected into patients at four separate sites for intra-articular injection: in the superior joint space, inferior joint space, retrodiscal tissue, and injection into the anterior capsule. The results showed that the retrodiscal site was the most effective for reducing clicking and subsequently improving derangement, while the inferior joint space was the best site for pain relief, and the extracapsular site should be used in cases of hypermobility. Hypertonic dextrose solutions at the injection site dehydrate the cells, which leads to inflammation of the local tissue, which in turn triggers the release of growth factors such as fibroblast growth factor and connective tissue growth factor. The subsequent healing leads to a reduction in pain and improved function (33).

Chęciński et al. (34) concluded that the advantage of intra-articular injections in the lower compartment over the upper compartment of the temporomandibular joint was apparent. Nevertheless, only four studies (totaling 337 patients) were included in the systematic review, and these studies were rated as having a moderate risk of bias, indicating that while the findings are suggestive, they should be interpreted with caution. Furthermore, the heterogeneity of the articles analysed in terms of the substances used meant that it was not possible to determine the average gain in efficiency due to the application of the technique in question.

Hyaluronic acid (HA) has been widely used due to its ability to stimulate synoviocytes to produce endogenous HA within osteoarthritic joints. This activity reduces the joint's coefficient of friction, thereby minimizing the risk of structural damage (35–37). The narrative review by Quaresma et al. (38) reported that viscosupplementation with HA is effective, yielding satisfactory outcomes in terms of improved joint function and reduced pain. However, when compared with the results of the articles included in this review, Toameh et al. (19) and Ramakrishnan et al. (22), observed the same analysed parameters and had superior results when they performed VS with Injectable Platelet Rich Plasma (i-PRP).

There is still no consensus in the literature regarding the optimal protocol for viscosupplementation, as it remains a relatively recent approach in the management of TMD, with ongoing advances in the properties of injectable substances (39). Moreover, the ideal injection frequency and the magnitude of expected outcomes remain uncertain, and robust, high-quality studies are still lacking to provide clear guidance for clinical practice (40).

This literature review highlights that certain factors may modulate the success of AC and VS, such as the duration of the condition and the patient's age. In a high-quality RCT involving 76 patients with osteoarthritis who underwent a cycle of five weekly arthrocentesis procedures combined with HA injections and were followed for one year, better outcomes were observed in patients aged 45 years or older (41). The fact that younger individuals responded less favorably to this protocol suggests the need for a more individualized interpretation of diagnostic findings—particularly considering combined clinical presentations involving both muscular and articular overload, as well as psychosocial factors described in Axis II of the TMDs (42–44).

Regarding the classification of the levels of evidence obtained by the articles included in this review (table 2), each article was carefully analysed and divided into three levels (I, II or III), considering the risk of bias. The study article conducted by Işık et al. (23) was classified as level I evidence and presented a low risk of bias. The article received an "A" grade in all the criteria evaluated and, despite reporting loss to follow-up, the rate remained within acceptable limits. In addition, the authors considered an attrition bias of 10% in the sample calculation, including extra participants to compensate for possible drop-outs, which strengthens the methodological quality of the study. The literature indicates that studies with losses of more than 20% are unreliable and recommends a limit of 15% for losses in long-term studies (45) and 10% for studies lasting less than three months (46). In the case of Işık et al. (23), in addition to the sample calculation having foreseen the loss, there was a follow-up of at least 6 months.

In the study articles conducted by Toameh et al. (19), Yilmaz et al. (20), Rajput et al. (21), Ramakrishnan et al. (22), a common classification of level III evidence was observed. This categorization was influenced by the attribution of concept "B" in randomization and concept "C" to the methodological criteria of allocation concealment, blinding and sample calculation, which significantly impacted the definition of the level of evidence attributed to these studies and the risk of bias attributed to the results.

Randomization must be carried out randomly, without direct influence from the researcher or the subjects involved. This method should ensure that all participants have the same probability of being included in any of the intervention groups, promoting impartiality and strengthening the reliability of the results (47). Although the articles mention randomization, it is essential to specify the method used, as well as to check for possible changes in the randomized groups during the management of DDwR. The literature emphasizes that changes such as participants dropping out or being added should be assessed with caution, as they can compromise the outcomes (48).

Although they are often confused or used synonymously, allocation concealment and blinding correspond to different stages in the design of clinical studies (49). While randomization and allocation concealment are procedures that can be applied in all studies, blinding, on the other hand, is not always feasible, especially in cases with certain surgical interventions that make it difficult to conceal the identity of the intervention applied (50,51).

Allocation concealment has a direct impact on clinical trials, as it avoids selection bias by ensuring that research participants remain unknown until the time of the intervention. When this is not done, the results of a clinical trial can be overestimated by up to 40% (52). To ensure allocation concealment, opaque, sealed and sequentially numbered envelopes can be used, which should only be revealed at the time of the intervention (53,54). This procedure prevents researchers from influencing the assignment of participants to certain intervention groups (55).

As for blinding, if it is not done properly, some biases can occur, such as performance bias, detection bias and the so-called Hawthorne effect. Performance bias in clinical trials occurs when there are systematic differences in the management or behavior of participants and researchers, especially when both are aware of the management allocation (56). Detection bias refers to possible distortions that occur when the outcomes of a study are assessed unequally between the compared groups. This type of bias can arise if the evaluator of the results has prior knowledge of the intervention received by the participants (57,58). The Hawthorne effect, on the other hand, occurs when people behave differently when they know they are being evaluated, which can be a source of bias, since outside the study, behaviour could be different (59). To avoid these forms of bias, it is essential that those responsible for measuring the outcomes are kept blind to the allocation of participants to the different groups.

Although the study article by Yilmaz et al. (20) scored “A” in 4 criteria, the lack of reporting and explanation of the sample calculation gave the article level III evidence and a high risk of bias. The description of the sample calculation is a crucial stage in a Randomized Clinical Trial (RCT), because it defines the portion of a population, i.e., a group of people selected according to established eligibility criteria, whose responses to management should closely reflect those that would be observed in the general population (60). When it comes to the reproducibility of a clinical study, as well as its external validity, an adequate and properly explained sample calculation provides a higher level of confidence for the study (61).

Among the strengths of this critical review is the fact that the included studies presented similar clinical parameters when measuring results, such as pain assessment using the same visual scale and jaw opening, making it easier to understand and compare the results obtained. In addition, it is worth highlighting the careful assessment of the risk of bias presented by the RCTs, corroborating the criteria established by CONSORT (16) and evidence-based dentistry (17,18).

Despite the thorough analysis of the articles included in this review, there are some limitations. These include the fact that the level of evidence provided by most of the articles selected is III, an important factor for recognizing quality scientific production, which ensures the veracity of the information provided by each article (62). In this sense, the conclusions presented by this review have a deficit caused by the high risk of bias in the articles analysed, making it difficult to categorically apply these conclusions and reach a consensus for evidence-based clinical practice regarding these procedures (63).

It should also be noted that the number of study articles available on this topic was small, and the heterogeneity of viscosupplementation (VS) materials limited the comparability between randomized clinical trials (64). Furthermore, although effect sizes and confidence intervals would provide a more precise quantification of clinical relevance of differences between AC alone and AC combined with VS, this analysis was not feasible due to substantial variations in VS materials, treatment protocols, follow-up periods, and outcome measures across studies. Thus, it is necessary to carry out primary studies on the use and application of VS and AC in patients with DDwR, so that a standardized protocol can be established for this dysfunction (65).

As observed in the five articles included in this review, arthrocentesis (AC) is considered a safe and effective procedure in the management of the DDwR, and it is frequently used as a control intervention in randomized clinical trials evaluating alternative therapeutic approaches. The growing incorporation of VCS reflects advancements in biotechnology within the healthcare field, with studies reporting favourable clinical outcomes (66). In this context, AC remains a widely accepted management approach for DDwR, while VS has emerged as a promising adjunctive management strategy—particularly when combined with biomaterials such as I-PRF, I-PRP, and HA. However, the limited number of high-quality study articles with methodological rigor restricts the generalizability of current findings.

An additional factor to be considered is the impact of practitioner experience when evaluating invasive procedures. While the expertise of the clinician has minimal influence on the efficacy of pharmacological interventions—regardless of potential placebo or nocebo effects—it plays a crucial role in procedures such as arthrocentesis, viscosupplementation, and surgical management. The skill and experience of the practitioner can significantly affect both clinical outcomes and the interpretation of study results. Therefore, this factor should be carefully considered in both clinical practice and in the evaluation of evidence for invasive management strategies in DDwR (6).

When considering surgical management for DDwR, it is also essential to evaluate the cost-benefit-risk profile of these procedures. Surgical interventions generally involve higher financial costs, longer recovery times, and increased risk of complications compared with conservative or minimally invasive approaches. Potential risks include joint damage, infection, or persistent pain, which must be weighed against expected benefits such as improved jaw function, pain relief, and prevention of further joint degeneration. Careful patient selection is critical to maximize therapeutic benefit while minimizing risk, ensuring that surgery is reserved for cases where non-surgical strategies have been unsuccessful and the anticipated functional improvements justify the associated costs and potential complications (67).

In addition to evaluating clinical efficacy, it is essential to consider the ethical principles guiding patient care, as outlined by Childress and Beauchamp (68). While statistical outcomes provide important evidence regarding the effectiveness and safety of different management strategies, the ultimate focus should remain on the well-being of the patient. Clinical decisions should reflect the principles of beneficence, non-maleficence, autonomy, and justice, ensuring that each intervention—whether conservative, minimally invasive, or surgical—is chosen not only for its potential efficacy but also for its ethical appropriateness in the context of the individual patient.

Conclusions

This review suggests that both arthrocentesis and viscosupplementation are efficacious and minimally invasive procedures for managing disc displacement without reduction. While AC alone demonstrated satisfactory clinical outcomes, its combination with VS—particularly with the use of hyaluronic acid, injectable platelet-rich plasma, or injectable platelet-rich fibrin—appeared to enhance therapeutic effects, contributing to greater pain reduction and improvement in jaw opening among patients with this condition.

Despite the benefits observed, there are still differences in the literature regarding the best protocol and the most effective material for viscosupplementation. In addition, most of the studies analysed in this review presented level III evidence and, consequently, a high risk of bias, which reinforces the need for more research with greater methodological rigor to ensure scientifically proven results accepted by the scientific community.

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Zusammenfassung

Einleitung

Ziel dieser Studie war es, die Wirksamkeit von Viskosupplementation und Arthrozentese bei der Behandlung von Patienten mit Diskusverlagerung ohne Reposition (DDwR) zu vergleichen. Diese systematische Übersichtsarbeit bewertete randomisierte klinische Studien nach den PRISMA-Richtlinien, mit einem in PROSPERO registrierten Protokoll (CRD42025650126).

Material und Methoden

Eine umfassende Literaturrecherche wurde in PubMed, Scopus, Web of Science, Cochrane, Embase und Google Scholar durchgeführt. Nach Anwendung der PICOS-Kriterien wurden fünf Studien eingeschlossen und hinsichtlich des Verzerrungsrisikos, des Evidenzniveaus und der klinischen Ergebnisse analysiert.

Resultate

Beide Verfahren zeigten eine vergleichbare Wirksamkeit bei der Schmerzreduktion und der Verbesserung der Kieferöffnung. Die alleinige Arthrozentese führte zu zufriedenstellenden Ergebnissen, doch die Kombination mit Viskosupplementation – insbesondere unter Verwendung von Hyaluronsäure (HA) oder injizierbarem plättchenreichem Plasma (I-PRF) – verstärkte die klinischen Effekte.

Diskussion

Die Wahl des Materials für die Viskosupplementation hatte einen direkten Einfluss auf das Behandlungsergebnis. Die eingeschlossenen Studien wiesen jedoch ein hohes Risiko für Verzerrungen auf, was die Notwendigkeit methodisch soliderer Untersuchungen verdeutlicht. Trotz dieser Einschränkungen bleibt die Arthrozentese eine bewährte Therapie, während die Viskosupplementation, insbesondere in Kombination mit Biomaterialien, als vielversprechende Ergänzung gilt, um die klinischen Resultate bei der Behandlung von Kiefergelenkserkrankungen zu verbessern.

Résumé

Introduction

L'objectif de cette étude était de comparer l'efficacité de la viscosupplémentation et de l'arthrocentèse dans la prise en charge du déplacement du disque sans réduction (DDwR). Cette revue systématique a évalué des essais cliniques randomisés selon les directives PRISMA, avec un protocole enregistré dans PROSPERO (CRD42025650126).

Matériels et méthodes

Une recherche exhaustive a été effectuée dans PubMed, Scopus, Web of Science, Cochrane, Embase et Google Scholar. Cinq études ont été incluses après application des critères PICOS et analysées quant au risque de biais, au niveau de preuve et aux résultats cliniques.

Résultats

Les deux techniques se sont révélées efficaces pour réduire la douleur et améliorer l'ouverture buccale. L'arthrocentèse seule a donné des résultats satisfaisants, mais son association avec la viscosupplémentation, notamment avec l'acide hyaluronique (AH) ou le plasma riche en plaquettes injectable (I-PRF), a renforcé les effets cliniques.

Discussion

Le choix du matériau de viscosupplémentation semble influencer directement les résultats. Cependant, la plupart des études présentaient un risque élevé de biais, indiquant la nécessité d'études plus rigoureuses. Malgré ces limites, l'arthrocentèse demeure une approche fiable, tandis que la viscosupplémentation, surtout combinée à des biomatériaux, apparaît comme une alternative prometteuse pour améliorer les résultats thérapeutiques des patients atteints de troubles de l'articulation temporo-mandibulaire.

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