

Manipulation Under Anesthesia (MUA): A Review of Long-Term Effects in Adhesive Capsulitis Treatment

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Abstract

One typical sign of TMJ illness is joint and muscle pain related to temporomandibular joint disorders. Vertigo, ringing in the ears, hearing loss, jaw stiffness, limited mobility, or locking of the jaw joint are some of the symptoms that might appear at the same time. The jaw joint may also hurt while opening or closing the mouth. Scientists study their mechanisms and genetic makeup.

Key words: TMDs; symptoms; treatment; causes

Introduction

Manipulation under anesthesia (MUA) is often utilized for adhesive capsulitis (also known as frozen shoulder (FS)) and other conditions. This involves stretching the tight shoulder joint capsule after administering the patient anesthesia to ensure maximum relaxation of the surrounding tissues. There has been increased controversy regarding MUA as opposed to other treatments, such as arthroscopic capsular release (ACR). In the general population, the prevalence of adhesive capsulitis ranges from 2% to 5% [1], and is most common after ages 50 and 60.[2] FS is a non-traumatic condition of uncertain origin. There is a gradual onset of pain and restriction of shoulder movement. It occurs without intrinsic shoulder dysfunctions, and in the presence of normal radiographic features.[3]

Previous research has shown that FS was a self-limiting and reversible condition. [4-5] Some researchers have proposed that FS is a chronic inflammatory condition, while others suggest that FS is due to fibrosis and fibroplasias.[6] FS is traditionally divided into three phases: Freezing, Frozen, and Thawing Phases.[7]

Today, there is not a unified medical management for FS. Traditionally, if conservative treatment does not improve symptoms of FS, MUA is an appropriate treatment choice.[8] MUA is a simple and effective procedure.

After MUA treatment, the adhesions in the capsule are torn apart, which may result in the restoration of proper range of motion (ROM) and relief of symptoms.[9] However, there is continuing controversy regarding its use, especially compared to other common treatments. In some cases, serious adverse effects can occur.[10]

This manuscript will serve to review MUA, and its long-term effects when compared to other treatments. This study will direct future research and influence clinical decisions in the treatment of FS.

Methods

A literature search was conducted using PubMed, Google Scholar, and the American Journal of PM&R. Search terms were (MUA OR Manipulation Under Anesthesia) AND (Frozen Shoulder OR Adhesive Capsulitis). Articles were selected if they were published from 2019 until 2024 and written in English. Priority was given to systematic reviews and randomized controlled trials (RCTs) due to their high yield and accuracy. Studies that did not collect data for longer than 6 months were excluded.

Discussion

Overall, studies demonstrate that there is no clinical advantage of using MUA as compared to ACR or other common treatments for FS. To further investigate differences, a qualitative study was performed with 44 patients by BMJ. This yielded no difference in patient satisfaction or preferences. Patients were assigned to 3 arms. 14 received early structured physiotherapy (ESP), 15 were administered MUA, and 15 were treated with ACR. The participants from each cohort stated that they would receive the same treatment that they were given in the trial and preferred the treatment within the arm they were assigned to.[11]

Although clinical endpoints were comparable, there were some differences that may affect the decision to implement MUA. Across all studies, ACR is associated with higher risk of certain complications. However, in a systematic review with meta-analysis of 8 studies (768 patients) by Y. Zhao et al., it was shown that MUA has higher recurrence of FS when compared to ACR in the long term (6+ months). [12]

A meta-analysis of 6 studies published by Y. Xiao et al. displayed that ROM differed among treatments. ACR patients were found to have better forward flexion ROM at 6 months, while MUA and ACR patients had similar ROM

at 12 months and in other movements at 6 months. It is of note that this meta-analysis found no difference in complication rates, contradicting the systematic review from Y. Zhao.[13]

Other studies displayed no clinical superiority between treatments, though they concurred that ACR carried higher risk and cost. There has been little research conducted on MUA despite its origin being nearly a century ago, and there are few real-world examples that carry statistical weight. One of the strongest trials was the UK FROST RCT, a multicenter, pragmatic, three-arm, superiority RCT, the largest of its kind evaluating MUA as a treatment for FS. [14-16] This RCT had 503 patients with 201 randomly assigned to receive MUA, 203 randomly assigned to receive ACR, and 99 randomly assigned to be treated with ESP. Of these, 189 MUA patients, 191 ACR patients, and 93 ESP patients completed the study and were analyzed for 12 months.[14]

From here, Oxford Shoulder Scores (OSS), EuroQOL 5-Dimension Questionnaires (EQ-5D-5L), Quick Disabilities of the Arm, Shoulder, and Hand Scores (Quick DASH), Pain Numeric Rating Scale (Pain NRS), and Extent or Recovery were measured. Statistically significant long-term findings included worse ACR Quick DASH scores (-4.71, $p=0.028$, $CI=95\%$) and worse pain NRS (-0.73, $p=0.0026$, $CI=95\%$) when compared to MUA at 12 months. Other scores had differences that were not statistically relevant. The UK FROST study also found that MUA not only carried fewer risks than ACR but was also the most cost-effective option. However, fewer ACR patients required further treatment after the initial visit. Thus, ACR ought to be considered when less costly options fail.[14]

There were several limitations with the studies used. Although MUA is used in the United States, very little real-world literature exists for MUA as a treatment for FS in the United States. Most studies originate from various other countries, including the UK, China, and Turkey. The largest RCT, the UK FROST trial, was the source of several studies included in this review. This was an excellent RCT, though a weakness was having longer time to treatment in the MUA cohort when compared to other treatments, potentially leading to worse outcomes in the MUA cohort. Other studies scored high on risk of bias assessments or had few patients and low power.

Future efforts should be implemented to investigate real-world effects of MUA as a treatment for FS to investigate whether it is also an effective option in the United States. Additionally, this review highlights the need for further development of treatment modalities for FS. Currently, there are few options for relief, and both MUA and ACR are invasive for the patient. At the time of this study, more research is needed to confirm MUA as a cost-effective or clinically effective treatment for FS in the United States.

Conclusion

Little research has been conducted regarding MUA as a treatment for FS, though it has clinical use for various other conditions. In other countries, MUA has been shown to have similar clinical outcomes as other common treatments, such as ACR, without as many complications. Additionally, MUA is less invasive than ACR and more cost-effective. Future work could verify these claims in the United States as well, confirming MUA as a valid treatment modality for FS. These findings could serve to provide a more definitive framework for unified medical treatment of FS

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