Manipulation Under Anesthesia of the Post-Hip Arthroscopy Stiff Hip – Retrospective Review of Range of Motion Improvement and PROs

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INTRODUCTION

- Femoroacetabular impingement (FAI) is the most common diagnosis indicated for hip arthroscopy.[1,2,3]
- Despite "successful" surgery to address labral tears and impingement correction, some patients will experience superficial anterior hip pain along with limited ROM and function post-operatively.[4]
- Pericapsular scarring is one cause of post-operative hip pain. Hip manipulation under anesthesia (MUA) is a potential treatment for this condition.[4]
- Hip MUA is a quick, out-patient procedure in which the patient is sedated, and the hip is manipulated through various movements to break up capsular adhesions.[4]

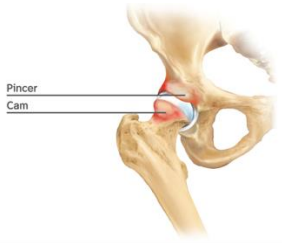

Figure 1 (above): Cam and pincer morphology of femoroacetabular impingement syndrome[5]

Figure 2 (above): Demonstration of a hip manipulation under anesthesia. The patient lies supine and the hip is put into flexion while an assistant holds the contralateral pelvis stable. The operative hip is then externally rotated while moving from flexion to full extension with circumduction.

AIM

- To evaluate the change in hip range of motion and patient reported outcomes after MUA in patients diagnosed with pericapsular scarring post-hip arthroscopy

METHODS

- Patients who underwent hip MUA from June 2020 to July 2023 were enrolled.
- Range of motion (ROM) and PROs (iHOT-12, mHHS, HOS, SANE, and PROMIS) were assessed pre-operatively and at 3, 6, 9, and 12 months post-operatively (index hip arthroscopy procedure)
- Wilcoxon signed-rank tests were used to evaluate for change in post-MUA ROM and PROs.
- Mixed modeling was used to look at repeated ROM measures on a continuous scale with time and MUA as predictors. LSmeans estimates were then calculated and compared to pre-manipulation measures at each time point.

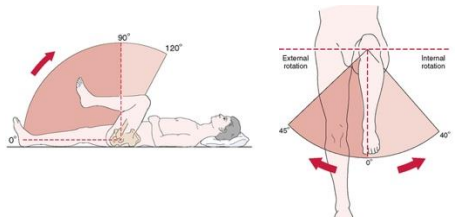

Figure 3 (above): Measurements of flexion, internal rotation at 90°, and external rotation at 90°[6]

	Avg Difference Pre vs Post MUA (°)	P-value
Flexion	2.89 ± 5.49	**0.001***
Internal Rotation @ 90°	19.56 ± 7.96	**< 0.0001***
External Rotation @ 90°	6.22 ± 8.86	**< 0.0001***

Table 1: Change in range of motion measurements immediately post-manipulation in degrees

RESULTS

- 41 patients underwent hip MUA during the study period. 31 patients were female and 10 male, with an average age of 33.75 years (SD 10.51)
- Average time between original scope and MUA: 10.4 ± 8.1 months
- Post operatively, patients had significant improvements in all three ROM parameters ($p \leq 0.001$)
- Mixed-modeling revealed that 9+-months post-manipulation, ROM in flexion increases by an estimated 10.6° ($p = 0.0007$), IR at 90° by 11.7° ($p < 0.0001$), and ER at 90° by 4.98° ($p = 0.0175$)
- At final follow up, patients had significantly higher iHOT-12 ($p = 0.0036$), mHHS ($p = 0.0475$), HOS-SS ($p = 0.0386$), and SANE-ADL ($p = 0.0103$) scores compared to pre-manipulation measures

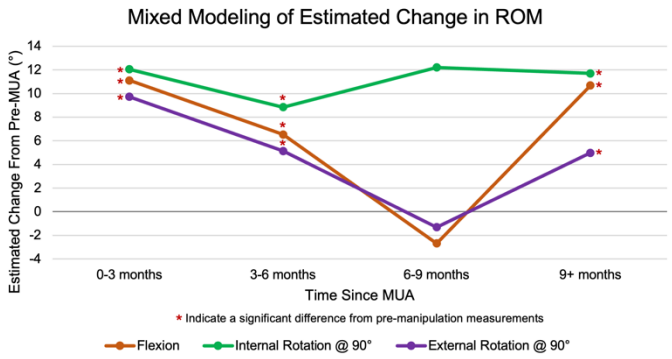

Figure 4 (above): Mixed modeling of changes in flexion, IR at 90°, and ER at 90° at various timepoints post-MUA. Asterisks indicate a significant change in ROM from pre-manipulation measurements

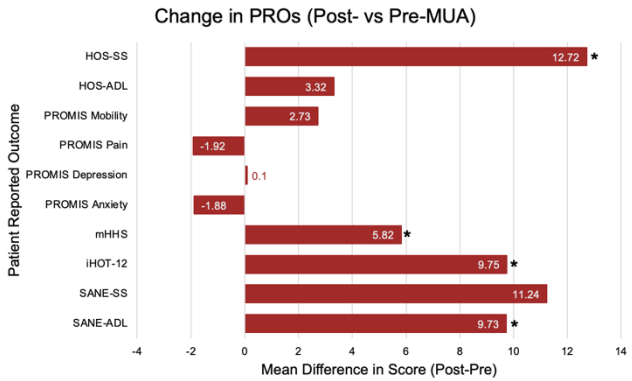

Figure 5 (above): Change in PROs pre-vs post MUA, using the first PRO collection post-manipulation. Post-MUA, patients had statistically significant improvements in mHHS ($p = 0.0475$), iHOT-12 ($p = 0.0036$), SANE-ADL ($p = 0.0103$), and HOS-Sport ($p = 0.0386$).

CONCLUSIONS

- Hip MUA is a non-invasive treatment option for patients with pericapsular scarring post-hip arthroscopy for FAI. The improvements in ROM and PROs suggest that hip MUA is successful in alleviating patients' pain while improving their sports performance and ability to perform activities of daily living.
- As this is a newly described procedure, data analysis was limited by small sample sizes. In order to make more definitive conclusions, our team aims to continue data collection to evaluate these outcomes in a larger cohort with longer term PROs.

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