**Article Full Title**

Manipulative and Multimodal Therapies in the Treatment of Osteoarthritis of the Great Toe: A Case Series

**Author Names**

Brantingham, J., Cassa, T.

**Reviewer Name**

Brenna Hammer, SPT, LAT, ATC

**Reviewer Affiliations**

Duke University School of Medicine, Doctor of Physical Therapy Division

**Paper Abstract**

Objective: The objective of this case series is to describe manual manipulative therapy with exercise for 3 patients with mild to moderate osteoarthritis of the great toe. Clinical Features: Three patients, a 32-year-old man, a 55-year-old woman, and a 49-year-old woman, had great toe pain of 8, 1, and 2 years, respectively. Each had a palpable exostosis, a benign outgrowth of bone projecting outward from the bone surface, and decreased dorsiflexion with a hard end-feel. Intervention and Outcome: Manual manipulative therapy with exercise, the Brantingham protocol, was used with patients receiving 6, 9, and 12 treatments over 6 weeks. Specific outcome measures for hallux rigidus and the foot were chosen to document the effects of this intervention including digital inclinometry, the lower extremity functional scale, the foot functional index, overall therapy effectiveness and Visual Analogue Scale (VAS). Each patient had an increase in range of motion that surpassed the minimal clinically important change, an increase in the overall therapy effectiveness and a decrease in the foot functional index that surpassed the minimally clinically important difference. Most importantly for the patients, each reported a decrease in both usual and worst pain on the VAS that exceeded the minimally clinically important difference of 20 to 30 mm. Conclusion: The 3 patients reported decreased pain measured by the VAS, increased range of motion and minimally clinically important difference in 3 other outcome measures.

**NIH Risk of Bias Tool**

Quality Assessment Tool for Case Series Studies

**Was the study question or objective clearly stated?**

Yes

**Was the study population clearly and fully described, including a case definition?**

Yes

**Were the cases consecutive?**

Yes

**Were the subjects comparable?**

Yes

**Was the intervention clearly described?**

No

**Were the outcome measures clearly defined, valid, reliable, and implemented consistently across all study participants?**

Yes

**Was the length of follow-up adequate?**

Yes

**Were the statistical methods well-described?**

Yes

**Were the results well-described?**

No

**Key Finding #1**

The inclusion of manual and manipulative therapy in the treatment of great toe osteoarthritis decreased patient reported pain and increased patient reported function and range of motion.

**Key Finding #2**

Benefits of manual manipulative therapy in treating great toe osteoarthritis may be seen in as few as 6 treatment sessions; however, less treatment sessions correlated with a greater loss of benefits at the 1 year follow up point.

**Key Finding #3**

**Key Finding #4**

**Please provide your summary of the paper**

This case series examined three patients who had a history of great toe osteoarthritis with the intent of describing the utility of manipulative manual therapy in treating this condition. After ruling out systemic or musculoskeletal pathology that would contraindicate the use of manual therapy in this condition, the subjects were each put through the "Brantingham Protocol" which describes specific protocols and procedures to treat the great toe. It was ultimately suggested that manual therapy be included in treatment of great toe osteoarthritis according to patient and clinician preference, and note was made on the lack of research regarding manual therapy for this particular pathology.

**Please provide your clinical interpretation of this paper. Include how this study may impact clinical practice and how the results can be implemented.**

While this case series showed promising results in using manipulative therapy to treat great toe osteoarthritis, the results were insufficient to have a significant impact on current practice. The study only included 3 patients who were close in age, therefore decreasing external validity. Additionally, only one specific protocol was examined, which does not accurately reflect all possible manual and manipulative therapies that may be utilized. However, this study did not lead to the belief that manual therapy would be harmful or carry risk in the treatment of great toe OA, and therefore may still be considered for the multimodal benefits. There is very little research on the effect of manual and manipulative therapy in the treatment of great toe osteoarthritis, so this article may be a base for future studies in this area.