

# Comparison between Positional Release Technique and Active Release Technique in Management of Piriformis Syndrome

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## ABSTRACT

**Background and Purpose:** Ailment of the musculoskeletal system that is painful Piriformis syndrome (PS) is characterised by pain in the buttocks or hips. It has been defined as an inflammation of the sciatic nerve branches caused by an abnormal state in the piriformis muscle, such as an injured or inflamed muscle (PM). The goal of this research is to compare and contrast the impact of positional and active release techniques on the treatment of piriformis in males and females with piriformis syndrome.

**Materials & Methods:** Thirty healthy piriformis syndrome patients will be randomly allocated to one of two trial groups. On Group A (n=15), the Active Release Technique is employed, while on Group B (n=15), the Positional Release Technique is used. The FAIR test will be used to evaluate piriformis syndrome before to and during treatment. GROUP-A (Active Release Technique): Participants will get one session of Active Release Technique (ART) on their dominant side. Group B (positional release technique): Fifteen healthy males and females will be chosen, and the therapist will use one hand to apply light pressure to the trigger point location with the pad(s) of the finger(s) and hold for two minutes or until the pain decreases (determined by asking the participant to report a VAS score at 30 second intervals). To maintain the most comfortable posture, fine tuning was accomplished using the therapist's other hand, depending on the location of the trigger point (position of less sensitivity). This procedure was continued throughout the PRT treatment sessions.

**Results:** When Group A and Group B are compared, the study's findings indicate that Group B has a greater impact, as the negative scores for FAIR TEST were 59 percent, compared to 31 percent for Group A. For the SEATED PIRIFORMIS TEST, Group A had a negative score of 32%, which was lower than Group B's negative score of 57%. P value was less than 0.05 for the difference between Pre and Post data.

**Conclusion:** This study has shown that positional release method has more advantages than Active Release Technique, and that positional release technique is a more successful treatment for Piriformis syndrome. For piriformis syndrome, both surgeries produced statistically significant effects on the patient's condition.

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## INTRODUCTION

Painful musculoskeletal ailment Piriformis syndrome (PS) is characterised by buttock or hip discomfort. It has been characterised as an inflammation of the sciatic nerve branches that is produced by an aberrant condition, such as an injured or irritated muscle, in the piriformis muscle (PM). The deep gluteal syndrome, extra-spinal sciatica, wallet neuritis, etc. are all common synonyms for PS. Piriformis syndrome is more common in women than males, with a 6:1 female-to-male ratio. Women's os coxae have a broader quadriceps femoris muscle angle, which may account for this disparity(1).The piriformis muscle (PM) originates from the anterior sacral foramina (superior margin of the greater sciatic notch), the sacroiliac joint (anterior margin of the anterior sacroiliac ligament), and the anterior surface of the Sacro-tuberous ligament on the pelvic surface of the sacral segments S2 and S4, respectively(2). The greater trochanter of the femur is inserted into the greater sciatic notch. Hip abduction and partial extension are all facilitated by the PM's

functional role in external rotation, abduction, and partial extension. Congenital differences in the sciatic nerve's position in the pelvis have been documented. Using a six-category categorization scheme, Beaton and Anson have categorized the connections between the PM and the sciatic nerve. Types "B" through "F" are believed to have an abnormal interaction between the PM and the sciatic nerve, but type "A" is considered normal(3).

A split piriformis muscle, a split sciatic nerve, or an abnormal sciatic nerve route are all possible anatomical causes of primary piriformis syndrome. Piriformis syndrome has a main cause in less than 15% of patients. As of right now, there is no evidence to support the hypothesis that a sciatic nerve aberration causes piriformis syndrome or any other kind of sciatica. Piriformis syndrome may not be as dependent on piriformis and sciatic abnormalities as previously assumed, according to these studies(4). Precipitating factors include macro and micro trauma, an ischemic mass effect and a local ischemia. Secondary piriformis syndrome arises as a consequence. Macrotrauma to the buttocks, resulting in soft tissue inflammation, muscular spasm, or both, and nerve compression, is the most common cause of Piriformis syndrome (50 percent of patients). Direct trauma, post-surgical injury, lumbar and sacroiliac joint diseases, or overuse are the most common causes of muscle spasms in the PM. Additionally, muscular shortening may be induced by abnormal biomechanics in the lower leg, lower back and pelvic areas. Sciatic nerve compression or discomfort is a possible outcome. While there are a number of possible causes for piriformis dysfunction, one common one is that it may cause pain and discomfort in different parts of one's lower body. When the piriformis muscle is repeatedly overworked, such as during long-distance walking or jogging or when it is directly compressed, microtrauma may occur. The recurrent pain induced by sitting on hard surfaces, known as "wallet neuritis," is one example of this kind of direct compression(5).

A kind of manual therapy called positional release may be used to treat chronic and subacute muscular spasm and the accompanying pain and dysfunction. Dr. Lawrence H. Jones' work in the 1950s culminated in the publication of his book *Strain and Counterstrain* in 1964, which served as a major influence on positional release methods. Positional Release Therapy (PRT) is a modern version of Strain & Counterstrain (S&C) that incorporates new positioning and supplementary equipment while retaining its basic objective and method. 'Guarding', poor posture, favoring an injured region, and/or bracing and immobilization may all lead to protective muscle spasm, which is a direct outcome of injury and a subsequent manifestation of inflammation. There are many times when a person is in a state of chronic muscle spasm when the intensity of spasm is out of proportion to their damage(6). Even after the injury has healed, the patient may still have discomfort and poor biomechanics as a consequence of this. The normal fascial, neuromuscular, and other connective tissue interactions are often altered by chronic spasm. It induces ischemia, inhibits lymphatic outflow, and raises the concentration of metabolites (waste products) in the tissue as a result of this hypertonicity, which prolongs inflammation(7).

Using the muscular spindle mechanism and its accompanying reflex mechanism (which governs spasm), PRT works to restore a more normal firing of the spindle and a more normal tension in the muscle, resulting in a more normal connection among the surrounding soft tissues. As a consequence of their use, these methods help to calm down both the overactive myotatic reflex and the overpowering input from the surrounding dermatome, which in turn reduces the likelihood of an overflow of neurotransmitters and, as a result, increased pain. The term "facilitated segment" is used to describe this phenomenon. PRT essentially "sets the scene" for more efficient operation of routine activities. Allows for more regular circulation, lymph drainage, and biomechanical function by reducing localized spasm, thereby increasing range of motion and decreasing discomfort PRT greatly enhances the efficacy of standard therapeutic regimens(8). A soft tissue technique known as "Active Release Techniques" (ART) aims to reduce tissue tension by dissolving fibrosis/adhesions that may form in tissues over time as a consequence of overuse or repeated motion. Nerve and muscle pain, tingling and weakness may all be symptoms of these conditions(6).

Many people believe ART may help diagnose and cure many different diseases, however there is little data to back up these claims, and the little scientific evidence is anecdotal and case-based. Chiropractor Dr. P. Michael Leahy invented and filed for patent on ART. It was Dr. Leahy's observation that the symptoms of his patients were linked to alterations in their soft tissues that led him to create this procedure. Myofascial Release was the term he gave to his initial study in 1985, although he subsequently patented it as Active Release Techniques(9). Trauma may cause edema, fibrosis, and adhesions in the tissues. Compressive, tensile, and shearing forces are used by the clinician during treatment to treat repetitive strain injuries, cumulative trauma injuries, and lesions caused by long-term, high-pressure pressures(10). The patient is encouraged to actively shift the injured site from a shortened to a lengthened position as the therapist provides deep tension to the region of discomfort. Moving the patient in such a way as to cause a longitudinal motion of soft tissues, such as nerves, ligaments, and muscles, underneath the contact point(11).

## PROCEDURE

A total of 30 subjects with piriformis muscle pain will included in the study. The subjects will be screened according to the Inclusion or Exclusion criteria. Before the study, written consent form will be taken from all subjects through that sufficient explanation of the procedure, purpose and risks/benefits was provided to all subjects.

**DEPENDENT VARIABLE- FAIR** Test (flexion adduction and internal rotation), seated pisiformes test. **INDEPENDENT VARIABLE-** positional release technique and active release technique. Total 30 healthy subjects with piriformis syndrome will be randomly allocated to two study groups. Group-A (n=15) receive Active Release Technique and Group-B (n=15) positional release technique. Assessment of pisiformes syndrome will be measured by using FAIR test before and after the treatment.

**GROUP-A** (Active Release Technique): Subjects will be received single session of Active Release Technique (ART) on dominant side. There are 2 steps to perform ART.

Step 1: Subjects lies supine on the plinth and gentle tension was applied to the pisiformes muscle along the entire length while stretching the leg in different positions to better work the muscle.

Step 2: Gentle tension will be applied at the origin and insertion of the pisiformes muscle.

**Group B (positional release technique):** Fifteen healthy males and females will be chosen, and the therapist will use one hand to gently press on the trigger point with the pad(s) of the finger(s) and hold for two minutes, or until the pain decreases (determined by asking the participant to report a VAS score at 30 second intervals). To maintain the most comfortable posture, fine tuning was accomplished using the therapist's other hand, depending on the location of the trigger point (position of less sensitivity). This procedure was continued throughout the PRT treatment sessions.

## RESULTS

When Group A and Group B are compared, the study's findings indicate that Group B has a greater impact, as the negative scores for FAIR TEST were 59 percent, compared to 31 percent for Group A. For the SEATED PISIFORMIS TEST, Group A had a negative score of 32%, which was lower than Group B's negative score of 57%. P value was less than 0.05 for the difference between Pre and Post data.



**Table No 1 Demographic Descriptive Statistics (Weight, Height, Bmi)**

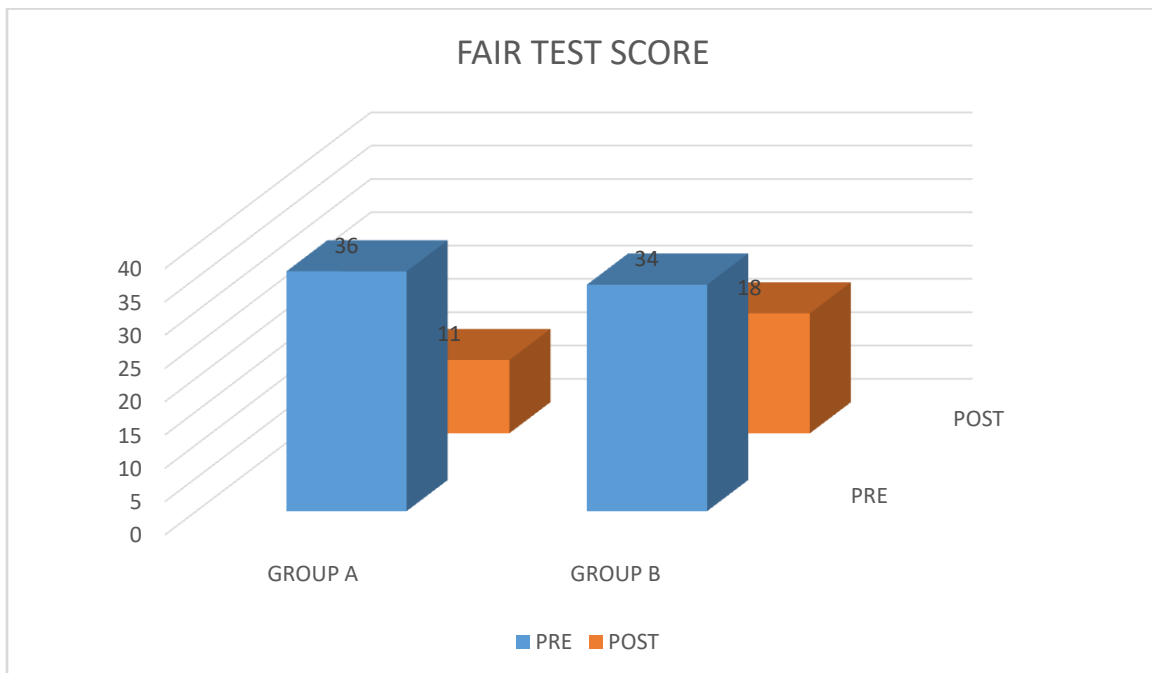
	AGE	WEIGHT(KG)	HIGHT IN METER	BMI
Mean	33.87	72.59	1.7423	24.2116
N	30	30	30	30
Std. Deviation	7.654	10.380	.12213	4.76993

**Table No 2 Fair Test Score (Pre And Post)**

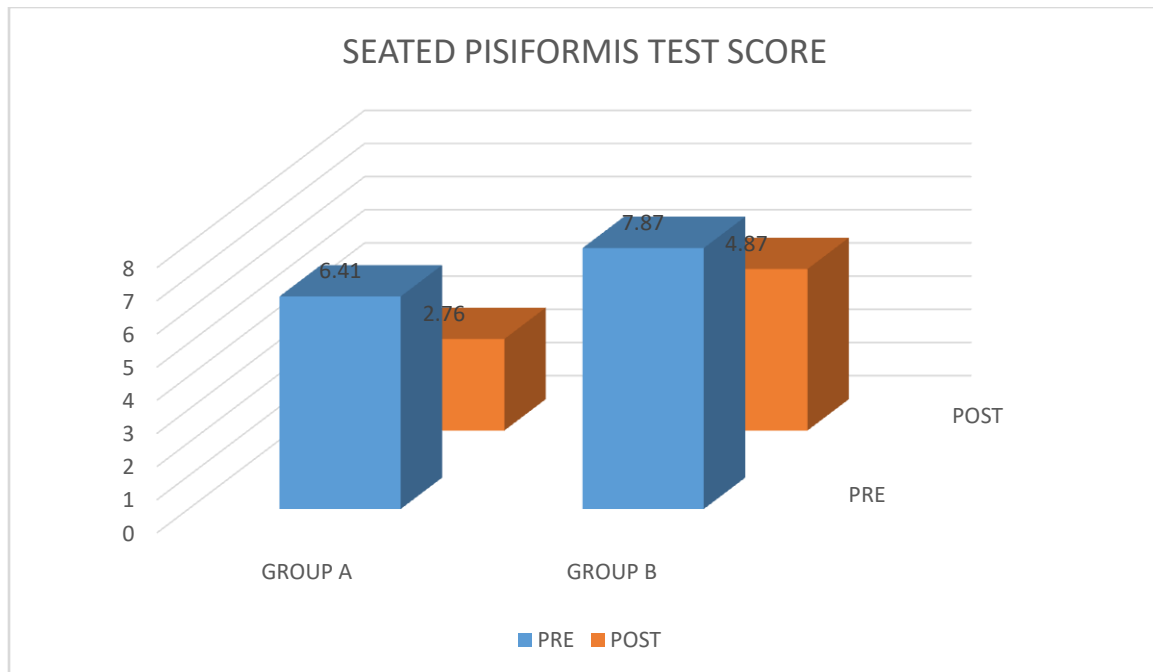
	POSITIVE	NEGATIVE	P VALUE
GROUP A PRE	100%	0%	P<0.05
GROUP A POST	69 %	31 %	
GROUP B PRE	100%	0%	P<0.05
GROUP B POST	41 %	59 %	

**Table No 3 Seated Pisiformis Test (Pre And Post)**

	POSITIVE	NEGATIVE	P VALUE
GROUP A PRE	100%	0%	P<0.05
GROUP A POST	68 %	32 %	
GROUP B PRE	100%	0%	P<0.05
GROUP B POST	43 %	57 %	



**GRAPH NO 1 FAIR TEST SCORE (PRE AND POST)**



**GRAPH 2 SEATED PISIFORMIS TEST (pre and post)**

### DISCUSSION

When Group A and Group B are compared, the study's results reveal that Group B had a bigger influence, as negative FAIR TEST scores were 59 percent for Group B, compared to 31% for Group A. Group A received a negative score of 32% on the SEATED PISIFORMIS TEST, which was lower than Group B's negative score of 57%. The difference between Pre and Post data has a P value less than 0.05. In 2020, Nirali M Jain et al. The gastrosoleus's most helpful trigger sites are determined using a universal goniometer (NRS), Active Release Technique (ART), and Positional Release Therapy (PRT) (GSTPs). All 30 patients were sorted into two groups of 15 each using the inclusion and exclusion criteria. Active Release Technique was utilised to treat the gastrocnemius and soleus muscles in Group A, while Positional Release Therapy was used in Group B. Dorsiflexion range of motion was measured before and after NRS therapy. After employing Positional Release Therapy to release trigger points, ankle dorsiflexion range of motion was enhanced and discomfort was significantly decreased. 2021 Musa S. Danazumi et al. INIT (integrated RRAF to PRT) was investigated as a possible therapeutic option for patients with PS in this study. Participants with Parkinson's disease (PS) were randomly assigned to either INIT or PRT treatment regimens for this study. Each group met twice weekly for eight weeks in a succession for psychotherapy. In the INIT group, the therapist applied intermittent or continuous pressure for 20–60 seconds on the patient's sensitive area or trigger point. In the PRT group, a little amount of pressure was given to the trigger point for two minutes or until pain subsided. The impact of the therapy was determined using analysis of variance with repeated measurements (ANOVA). INIT has been demonstrated to be more successful than PRT in treating people with Parkinson's disease. Stretching exercises may have had a part in both groups' exceptional recovery, given they were performed in conjunction with their main treatment. Greetings, Ms Ajimsha (2016) Self-myofascial release was evaluated on nurses to see whether it relieved non-specific low back pain. The investigation was undertaken by the clinical branch of the Myofascial Therapy and Research Foundation in Kerala, India. A minimum of three months of NSLBP infection was observed in nursing personnel aged 30 to 50. Nurses and physical therapists gave SMFRs and sham-MFRs to patients at predefined doses. SMFR was shown to be more effective than a control in treating NSLBP in nursing professionals in this study. Cost-benefit evaluations may be included into the research process in the future. Nurses may learn SMFR in order to assist patients with NSLBP in avoiding LBP, which may be beneficial for a large number of them.

#### Future scope of study

- More study can be done with higher sample size in the study.

**Conflict of interest: -None**

## CONCLUSION

This study has shown that positional release method has more advantages than Active Release Technique, and that positional release technique is a more successful treatment for Piriformis syndrome. For piriformis syndrome, both surgeries produced statistically significant effects on the patient's condition.

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