



# Comparison of theragun and massage ball on latent trigger point of adductor pollicis among medical students

## Abstract

**Background:** Trigger points are hyperirritable points that are tender to touch. Adductor pollicis is a muscle of thenar eminence. Muscle action is to help in gripping and holding things. Medical students are involved in prolonged writing sessions during exams so that latent trigger point of adductor pollicis is commonly present in them. Treating trigger points with massage ball and theragun, to compare the effectiveness of theragun and massage ball.

**Objectives:** To compare the effectiveness of theragun and massage ball in the treatment of latent trigger points in adductor pollicis muscle.

**Material and Methods:** Theragun, massage ball, algometer, table, and visual analog scale were used for the research. Subjects were divided into two groups by a simple random sampling technique. Half of them were treated with massage balls and the other half with theragun. Group A was treated with theragun, two treatment sessions of 1 minute were given to the subjects with a resting interval of 30 seconds. Group B was treated with a massage ball they were asked to roll the massage ball under the trigger point and bear the pain up to 7 scores of VAS. The comparative effectiveness of both treatments was assessed by a pain pressure algometer.

**Results:** The latent trigger point of adductor pollicis was painful when treated with theragun or massage ball. Statistically, there was no significant difference between these two treatment methods. During the pretest mean pressure-bearing capacity of a male was  $30.23 \pm 3.219$  lbs and female was  $29.47 \pm 2.065$  lbs the difference was not statistically significant (p-value 0.423)

**Conclusion:** Our findings demonstrate that a theragun and massage ball is equally advantageous in the treatment of latent trigger point of the adductor pollicis muscle of thenar eminence.

**Keywords:** Trigger point, Physiotherapy treatments, theragun, massage ball use, percussive therapy.

## Introduction

“A Trigger Point (TrPs) is a hyperirritable point in taut band of the skeletal muscle. On palpation patient presents referred pain and jump sign”. TrPs are tender to touch and can refer pain to the distant part of the body. Patients may have regional and continuous pain, resulting in a reduced Range of Motion (ROM). Trigger points are present in the specific syndrome known as myofascial pain syndrome which presents approximately 16-18 trigger points all over the body. There are two types of trigger points Active TrPs and Latent TrPs [1-3].

Trigger point releasing tools have been found to increase Range of Motion (ROM) and reduce the risk of injury. The soft tissue component of connective tissue is called Fascia. It is known

that fascia surrounds each muscle and organ in the body. Techniques to release trigger points in muscles are a form of myofascial release. Tools are typically used for trigger point release foam rollers, massage balls, vibrating rollers, and percussion therapy [4-6].

The effectiveness of Theragun on improving muscle flexibility. The reason behind this is the Theragun activates the Golgi tendon organ and results in a relaxation reaction from the higher center, which reduces the tension in the respected muscle, improves blood circulation and nutrition to the tissue, increases the removal of toxic material from tissue that leads to decrease tightness and improve muscle flexibility. Theragun has proved the fascia releasing a tool in past research, they hypothesize that Theragun has reduced muscle fatigue and increased the

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range of motion of the muscle. Theragun has the potential for early muscle recovery. Theragun is effective in the treatment of deep tissue, with benefits including pain reduction, increased blood flow, improved scar tissue, decreased lactate, reduced muscle spasms, increased lymphatic flow, inhibition of the Golgi reflex, increased range of motion, and better recovery based on the principles of fascial connective tissue treatment. The patient can use Theragun by himself but it is an electric device so it can't be handed over to the patient to use it by himself. Most people like to buy a massage gun that can provide relief. The patient can't use it at home by himself because it is difficult to handle. Theragun can cause muscle soreness because it increases the local temperature due to repeated movements. The mild inflammation and pain complained by a patient after overuse of Theragun [7-10].

As a myofascial trigger point, pressure release needs the application of pressure to the deep muscle layer to reduce muscle tension. From a physics point of view, a hard massage ball would be advantageous for providing pressure to the deep muscles, as the force induced would be more concentrated on the target tissue rather than being dispersed, as occurs with the use of a soft massage tool [11].

On the other hand, the firm pressure of a hard massage ball may cause muscle twitch. The effectiveness of the technique of myofascial self-massage using tennis balls in fitness. The massage ball is the tool to release the trigger point in the muscle. The massage ball is easy to use for pain relief therapy and trigger point therapy. A hard massage ball causes increased ischemic compression and pain relief. Massage balls don't always give relief to pain. Patients report soreness and an increase in pain after using massage balls [12-15].

## Method

This study is a quasi-experiment and it was held at Shalamar Institute of Health Sciences. A detailed history of each subject was taken to rule out any existing systemic pathology, red flag, and any other chronic illness. After these baseline examinations patients were recruited based on inclusion and exclusion criteria by purposive sampling. The written consent and the study protocol were provided after the recruitment. No participant was forced to participate in the research. After signing the consent form, basic demographics were documented. Students were divided into two groups Group A and Group B. Subjects were requested to sit in a chair with

a supported hand and pain pressure threshold was measured by pressing the algometer on the trigger point till they feel pain and said to stop. Readings were recorded in pounds Lbs. Then massage to group A was provided with theragun on hand with the intensity at Level 1, and group B with a hard massage ball on hand with the maximal intensity that can cause aggravation of pain in the trigger point. Pain intensity in group B was measured by the Visual Analog Scale (VAS) to control the ischemic compression. In group, A Theragun was applied by the researcher while in group B participants rolled a massage ball under his/her hand by aggravating pain up to 7 VAS. The intervention was provided with a hard massage ball and theragun for 1 minute with an interval of 30 seconds so that two readings were taken (for pre and post-value) in pounds, with the interval of 30 secs and no follow-up. Post-reading was taken in the same manner as in pre-readings. Readings were documented in the table. The whole procedure took only five minutes. The difference between pain pressure threshold PPT before and after intervention determined the effectiveness of tools.

## Results

A total of 32 participants (13 males and 19 females) were recruited for this study from age 22 to 25 shown in the table. Demographic variables with Mean  $\pm$  SD of continuous variable i.e. Age ( $23.06 \pm 1.014$ ), BMI ( $21.766 \pm 1.525$ ), and frequency of discrete variable, Gender (male 13, female 19).

In between groups comparison, the results show that there is no significant difference between Theragun and massage ball treatment results with  $p > 0.05$ .

### ■ Independent samples test

During the pretest mean pressure-bearing capacity of the male was  $30.23 \pm 3.219$ lbs and the female was  $29.47 \pm 2.065$ lbs. The difference was not statistically significant ( $p$ -value 0.423). Independent sample t-test shows that the t-value for the pretest is 0.063 and in the post-test, it is 0.232 which is  $>0.05$  so statistically, the null hypothesis is approved that there is no difference between the two treatment methods.

### ■ Correlations between two groups

Paired sample t-test shows post-test results of theragun and massages ball  $33.13 \pm 2.24$  and  $34.38 \pm 3.423$  with the Standard error of .562 and .856 respectively TABLES 1- 6.

**TABLE 1. Demographic variables**

	No. of subjects	
	Group A	Group B
<b>Gender</b>		2
<b>Male</b>	7	6
<b>Female</b>	9	10

**TABLE 2. Demographic variables**

	Male	Female	Sig. (2-tailed)
<b>Pretest</b>	30.23 ± 3.219	29.47 ± 2.065	0.063
<b>Post Test</b>	33.08 ± 2.783	34.21 ± 2.992	0.232

**TABLE 3. Gender Distribution**

Gender	Frequency	Percent
<b>Male</b>	13	40.6
<b>Female</b>	19	59.4
<b>Total</b>	32	100

Among the subjects, 13(40.6 %) were male and 19 (59.4 %) were female.

**TABLE 4: Between group comparison**

	Male	Female	p-value
<b>Pretest</b>	30.23±3.219	29.47±2.065	0.423
<b>Post Test</b>	33.08±2.783	34.21±2.992	0.288

**TABLE 5: Independent Samples Test**

Demographic variables	Mean ± SD
<b>Age</b>	23.06 ± 1.014
<b>BMI</b>	21.766 ± 1.525

**TABLE 6: Correlations between two groups**

Treatment methods	Pretest	Posttest
<b>Theragun Treatment</b>	28.94 ± 1.389	33.13 ± 2.247
<b>Massage ball treatment</b>	30.63 ± 3.202	34.38 ± 3.423

**Discussion**

This study recruited 32 participants between the ages of 22 to 25 years. After obtaining consent from participants who meet the criteria, divided into two groups Group A and Group B, to be treated with theragun and massage ball after measuring PPT with an algometer. To measure the effects of both treatment methods, treatment was provided for 2 minutes at the 30-sec interval.

The current study compared the effects of theragun and massage balls in treating the trigger point of the adductor pollicis muscle.

Mechanical impact devices are an emerging type of myofascial release intervention used by sports medicine professionals. Despite their popularity, there are few published peer-reviewed studies on these devices, creating a gap between evidence and clinical practice. Lack of recommendations or evidence-based reviews to guide clinical practice. These devices are used by practicing healthcare professionals. The goals of previous studies were to examine the efficacy of theragun in plantar fasciitis, taut bands of the trapezius, hamstring shortening, back pain, and calf tightness. In this study, statistical analysis shows that there is no difference in these treatment methods, theragun and massage ball has been widely used for the treatment of muscle tightness in past research and clinical practices separately. In this study, we compared the effects of both treatments, and the results of theragun treatment were 28.94 ± 1.389 pretests and 33.13 ± 2.247 post-test with standard error of 0.3 and 0.5 while in the massage ball treatment pretest 30.63 ± 3.202 and 34.38 ± 3.423 are posttests. With standard error mean 0.800 and 0.856. To update our knowledge it is the first study that measures the PPT of latent trigger points and treatment of trigger points among medical students [16-17].

**Conclusion**

We concluded that in medical students of the 4th and final year between the ages of 22 to 25 years with normal BMI, a latent trigger point of adductor pollicis muscle was present. In the quasi-experiment, time was constant for both groups. Both groups were receiving treatment and pretest-posttest PPT readings were taken with an algometer. There was no difference in the treatment of theragun and massage. Both were equally effective for patients.

The massage ball was much easier for patients to use while theragun was used by the researcher.

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