

## Myofascial Release as a Method of Treatment for Bicipital Tendinopathy in Patients attending Sports Medicine Clinic of Teaching Hospital, Karapitiya

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### Abstract

**Objectives:** Bicipital tendinopathy causes shoulder pain and reduced range of motion (ROM). Analgesics and physiotherapy are used as treatments. The objective is to study the effectiveness of myofascial release for bicipital tendinopathy.

**Methods:** Sixty patients with anterior shoulder pain were randomly allocated to control and experimental groups (n=30/group). Control group received conventional physiotherapy for 10 days, while experimental group received myofascial release. Pain scores and ROM of the shoulder were assessed using a visual analog scale and digital inclinometer respectively, on days 1, 5 and 10. On each day, measurements were obtained before and after intervention.

**Results:** Control group consisted of 8 females and 22 males with a mean age of  $35.1 \pm 15.2$  years. Interventional group consisted of 9 females and 21 males with a mean age of  $34.4 \pm 12.3$  years. Rest pain for control group on day 1, day 5 and day 10 (pre and post intervention) were  $6.7 \pm 0.29$ ,  $6.03 \pm 0.29$ ,  $5.63 \pm 0.29$ ,  $5.17 \pm 0.24$ ,  $4.90 \pm 0.26$ ,  $4.43 \pm 0.27$ , respectively. Same parameters for the experimental group were  $6.60 \pm 0.35$ ,  $5.00 \pm 0.39$ ,  $4.30 \pm 0.30$ ,  $3.60 \pm 0.26$ ,  $3.10 \pm 0.26$ ,  $2.56 \pm 0.25$ , respectively. Both interventions significantly reduced pain scores compared to the baseline. Notably, experimental group demonstrated a greater reduction in pain score from day 1 to day 10 compared to the control group ( $p < 0.0001$ ). In the control group, change in ROM from the baseline for each session was  $2.96^\circ \pm 0.97$ ,  $3.66^\circ \pm 1.22$ ,  $4.56^\circ \pm 1.27$ ,  $4.43^\circ \pm 1.07$ , and  $5.20^\circ \pm 1.17$ . In the experimental group, the corresponding values were  $15.10^\circ \pm 5.37$ ,  $16.43^\circ \pm 5.51$ ,  $20.87^\circ \pm 6.66$ ,  $22.67^\circ \pm 7.41$ , and  $23.33^\circ \pm 7.71$ . The experimental group showed significantly greater improvement in ROM compared to the control group at each session ( $p < 0.001$ ).

**Conclusions:** Myofascial release works better than conventional physiotherapy for bicipital tendinopathy as it results in greater improvement of pain and ROM. Further research warrants to explore what could be the exact mechanism by which those improvements were happened.

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## Introduction

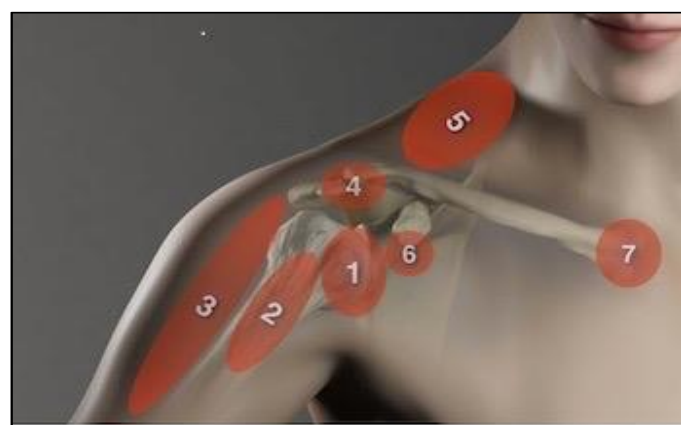
### Anterior shoulder pain

Shoulder pain and reduced range of motion (ROM) together with impaired shoulder strength are common musculoskeletal problems those athletes and patients seeking medical treatment. The community prevalence of shoulder pain varied widely across the countries with a median of 16% (range 0.67 to 55.2%). Primary care prevalence ranged from 1.01 to 4.84% (median 2.36%). The incidence of shoulder pain ranged from 7.7 to 62 per 1000 persons per year (median 37.8 per 1000 persons per year) (1).

The pain around anterior shoulder region is more common than posterior and encompasses variety of differential diagnosis. Along with comprehensive shoulder pain map (Figure 1), it is probably easiest to consider the differential diagnoses on an anatomical basis,

with specific anatomical pathologies giving rise to specific pain patterns (2,3).

Up to date, irrespective incomplete clinical understanding of its contribution, most researchers would agree upon that pathologies of the long head of the Biceps brachii muscle (LHB) could be a significant cause for anterior shoulder pain (4,5). The location, nature and differential diagnosis for anterior shoulder pain is summarized in Table 1.



**Figure 1: Anterior shoulder pain map**  
(Represented with the permission of [www.shoulderdoc.co.uk](http://www.shoulderdoc.co.uk).(Funk, 2020)

**Table 1 Location, nature and differential diagnosis for anterior shoulder pain (Modified table from [www.shoulderdoc.co.uk](http://www.shoulderdoc.co.uk))**

No	Location of pain	Nature of pain	Differential Diagnosis (DD)
01	Anterior joint line pain	localized and tender, often aching and dull	Capsulitis/Early-frozen Shoulder
02	Biceps groove pain	localized and tender, worse with lifting and carrying	Biceps tendonitis/Tendinopathy
03	Anterolateral pain	diffuse and radiates down arm - aching, but sharp pain with overhead activities	Rotator cuff pathology
04	Acromio-Clavicular Joint (ACJ) pain	very specific and localized - dull ache, but sharp with extreme overhead activities	ACJ Arthritis
05	Pain over trapezius	persistent, dull ache - can radiate down arm and unaffected by shoulder movements	Cervical Radiculopathy
06	Coracoid pain	localized tenderness over coracoid and sharp pain with shoulder adduction	Coracoid-impingement, Capsulitis, Pectoralis minor tightness
07	Sternoclavicular joint (SCJ) pain	localized and tender over SCJ, increased with overhead and adduction - consider	SCJ Arthritis

### What is Bicipital tendinopathy?

Tendinopathy of Biceps brachii muscle (BT) encompasses a clinical spectrum of pathology ranging from inflammatory tendinitis to degenerative tendinosis which commonly affects the LHB. However, the reason for predisposition remains unclear. Conditions of the LHB often occur with co-existence of other shoulder pathology including impingement, rotator cuff disorders, bursitis, acromioclavicular disorders, and superior labrum anterior-posterior lesions (SLAP).

Each of those conditions have all most similar clinical presentations consist of painful, weak, and restrictive shoulder movements termed as “Frozen shoulder” or “Adhesive capsulitis” (AC). Thorough clinical history and physical examination supplemented by the radiological investigations are necessary for the specific diagnosis of each of the conditions (5).

### Functional anatomy of biceps brachii around the shoulder joint

Shoulder is a complex ball and socket joint permits wide range of movements which include flexion, extension, abduction, adduction internal and external rotation and 360° circumduction. A functional understanding of the dynamic interplay of biomechanical forces around the shoulder girdle is necessary and allows for a more structured approach to the treatment of an athlete with a shoulder injury (6,7).

Muscles acting for dynamic shoulder joint movements can be divided in to two groups:

(1) muscles acting on glenohumeral joint

(2) muscles acting simultaneously on scapula to stabilize it while moving.

The muscles acting on the humerus to elevate arm are biceps brachii, deltoid, supraspinatus and subscapularis. Biceps brachii has historically been included by the anatomists in the shoulder flexor/elevator group. The structural arrangement of biceps brachii muscle makes it capable of generating considerable power and extensive range of motion becoming the most powerful anterior brachial muscle (8).

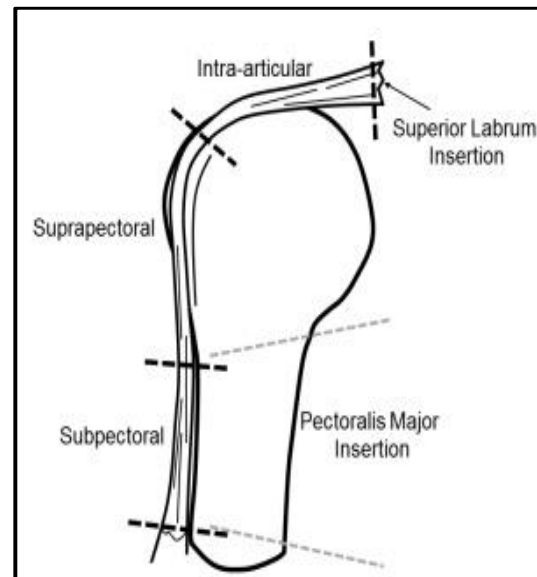
The LHB originates at the supraglenoid tubercle and the superior glenoid labrum. It inserts distally, along with the short head of the biceps, onto the radial tuberosity, with an attachment to the fascia of the medial forearm via the bicipital aponeurosis. The site of the LHB origin from the glenoid labrum is variable; in most cases, it arises either mostly posterior or completely posterior (55.4% and 27.7%, respectively) (9). Many shoulder literatures have shown that LHBT often has a dual attachment to the tubercle and glenoid labrum (10,11) But, more detailed recent study has revealed pronounced evidence to demonstrate that the LHBT originates approximately 50% from the superior glenoid tubercle and the remaining 50% from the superior labrum. Moreover, based on percentage of fibers arising from the tubercle, the anterior labrum, and the posterior labrum, four types of LHBT attachment leading to four different variations could have been distinguished.

- Type I- All the labral part of the attachment was to the posterior labrum, with none to the anterior labrum. (22%)
- Type II- Most was to the posterior labrum, but with a small contribution to the anterior labrum. (33%)
- Type III- Equal contributions to anterior and posterior labrum. (37%)
- Type IV- Most attached to the anterior labrum, with a small contribution to the posterior labrum. (8%)

Accordingly, the study has demonstrated the variability of the labral attachment, with strong posterior orientation (types I and II) in 55% and an even split between the anterior and posterior labrum (type-III) in 37%. Even type-IV tendon attachments (8%). The orientation of the tendon at its attachment to the superior glenoid, tubercle also varied; 51% were at 1 o'clock (posterior), 44% at 12 o'clock (neutral), and 5% at 11 o'clock (anterior). This correlated with the tendon attachment to the labrum: all type-III and type-IV attachments (mainly anterior) had either 11 o'clock or 12 o'clock orientation; type-I and type-II labral attachments were orientated around the 12 or 1 o'clock position (neutral or posterior) (12).

The biceps tendon is approximately 5 to 6 mm in diameter and 9 cm in length (Figure 2). Anatomically tendon is described in proximal, middle and distal sections and intra-articular & extra-articular portions. Intra-articular portion is typically wide and flat whereas the extra-articular portion is both rounder and smaller (9).

The more distal portion of the LHB is fibrocartilaginous and avascular to accommodate its sliding motion within its sheath in the groove, whereas the proximal tendon is more richly vascularized. A consistent difference in shape was noted between the proximal and middle levels, the tendon being flatter as it progressed over the humeral head and more triangular as it passed through the bicipital groove (13).



**Figure 02: Anatomical landmarks around the long head of the biceps**

#### Blood Supply

LHBT receives its blood supply from the ascending branch of the anterior circumflex humeral artery, which travels along with the tendon in its groove in the proximal humerus. The proximal tendon receives some arterial supply from labral branches of the suprascapular artery. The more distal portion of the LHB is fibrocartilaginous and avascular to accommodate its sliding motion within its sheath in the groove, whereas the proximal tendon is more heavily vascularized (9).

### Nerve Supply

A recent study demonstrated that the LHBT contains a network of sensory and sympathetic nerve fibers. However, it appears that these structures are not distributed homogeneously throughout the tendon body, but rather are primarily located in its proximal part. As a result, the proximal tendon is richly innervated by this network of sensory sympathetic fibers which may play a role in the pathogenesis of shoulder pain, with sensory nerve fibers containing substance P and calcitonin gene-related peptide. These substances are responsible for vasodilatation and plasma extravasation, as well as transmitting pain. As the neural network progresses distally, it becomes sparser. The study further concluded three major new findings.

- I. the tendon of the long head of the biceps contains a large network of sensory and sympathetic nerve fibers.
- II. this type of innervation is not associated with blood vessels.
- III. the innervation is not distributed evenly throughout the tendon but rather is found predominantly near its insertion (14,15).

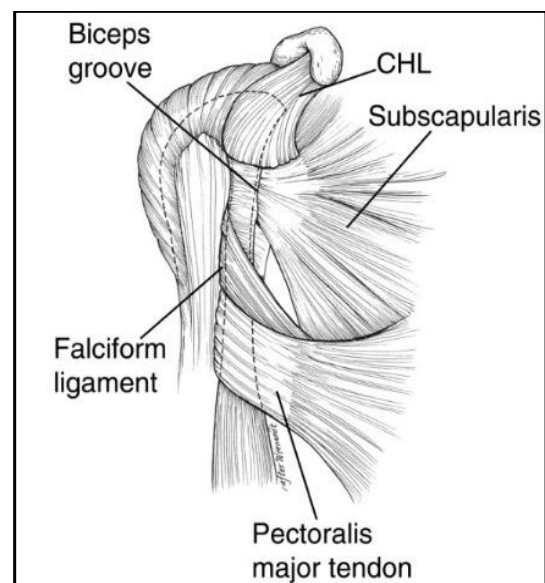
### LHBT Pulley System

Moving away from the origin, the LHBT is encased in a synovial sheath and is, therefore, considered intraarticular yet extra synovial, as it courses obliquely through the joint and arches over the humeral head. As the LHBT then exits from the joint and traverses through the rotator interval to the intertubercular groove (often referred to as the bicipital

groove), between the greater and lesser tuberosities, it is surrounded by a tendoligamentous sling.

The bicipital groove is an hourglass-shaped corridor between the greater and lesser tuberosities of the humeral head; this groove is narrowest and deepest at its mid portion. Although the contours of the tuberosities help to contain the LHB tendon within the bicipital groove, most of the restraint during tendon excursion is provided by the surrounding soft tissues, termed the LHBT pulley system.

The pulley system, a tendoligamentous sling, represents an important part of the rotator interval, which consists of four major structures. These four structures are the coracohumeral ligament (CHL), the superior glenohumeral ligament (SGHL), fibers of the supraspinatus tendon, and fibers of the subscapularis tendon.



**Figure 3: Biceps reflection pulley (BRP):**  
(Represented with permission of Journal of the American Academy of Orthopedics)



A soft-tissue sling stabilizes the extra-articular LHB as it enters the bicipital groove (Figure 3). This biceps reflection pulley (BRP) is built by fibers of the coracohumeral ligament (CHL), superior glenohumeral ligament (SGHL), and parts of the subscapularis tendon (9). Transverse humeral ligament (THL) bridges between greater and lesser tubercles stabilizing LHB tendon in the bicipital groove.

After coursing through the groove, the LHBT joins the short head of the biceps to form the biceps muscle belly at the level of the deltoid insertion.

The biceps brachii considered as the least important elevator muscle which also act as a weak forward flexor and abductor if the humerus externally rotated at 90°. Further, LHB has shown strong evidence that it could be an important dynamic stabilizer for shoulder motions restraining abnormal glenohumeral translations in all directions (16,17). In 1976, Furlani et al., conducted an EMG study on biceps brachii at different planes of motion where he concluded that during shoulder forward flexion both the LHB and short head of biceps (SHB) were active among all volunteers examined (18).

Another study by Landin et al in 2008 to assess the role of biceps brachii in shoulder elevation concluded that biceps brachii muscle has a role in shoulder elevation but only in early phase of the movement, in contrast to the conventional view that this muscle acts throughout the elevation motion. Therefore, the current data indicate that the biceps brachii's role is limited to the early phase of elevation and becomes

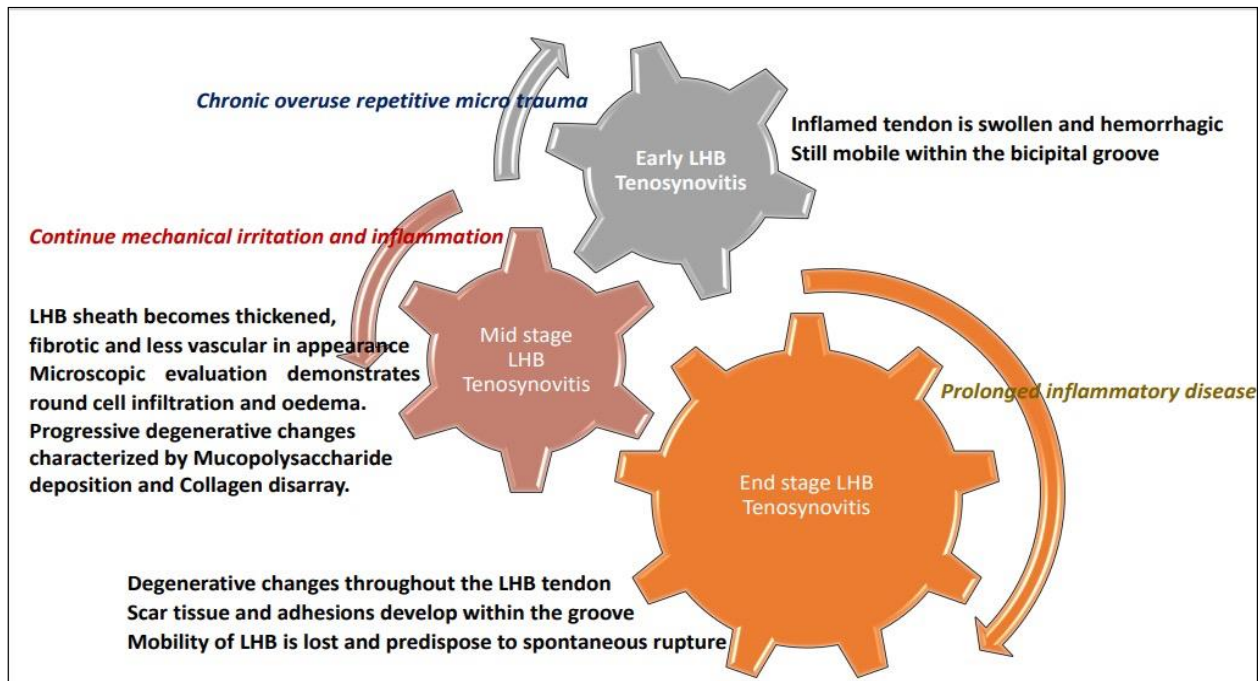
negligible as the shoulder elevation and elbow flexion increase (8).

### Pathophysiology

There is an inflammatory cascade to be found in the pathophysiology of long head of the biceps (LHB) tendinopathy. It starts with chronic overuse type of injury causing repetitive micro trauma within the LHBT. As a result, mild chronic inflammation sets up within the LHBT. After a considerable period of continuous micro trauma, the end result of degenerative changes with adhesions and scar tissue formation of LHBT will appear leading to loss of its mobility within the bicipital groove. Therefore, it is the LHBT trapped inside this bony ligamentous tunnel. This mechanical blockage explains the clinical picture of reduced ROM and power during forward flexion and pain and painful ROM (Figure 4).

### Clinical Features & Diagnosis

It causes nontraumatic, insidious onset of anterior shoulder pain (>2 weeks) usually starting from the anterior aspect of the shoulder and radiating down the anterior arm together with rest pain and night pain. Overhead activities and involvement in the manual/physical laborer occupations cause aggravation of symptoms. Clicking or audible popping can be felt if there is a proximal biceps instability.



**Figure 4: Algorithm of LHB Tendinopathy.**

The examination findings direct toward differentiating other shoulder pathologies from the LHBT. The proximal biceps provocation testing is more specific for the diagnosis. The classical sign to diagnose LHBT is the point tenderness at the bicipital groove. The speed test and the Yergason tests are the other specific provocation tests for LHB. Muscle wasting and reduced power could be demonstrated depending on the severity (9,19).

#### Justification

Shoulder injuries among athletes are either overuse or traumatic in origin. Sporting activities that require repetitive shoulder movements are at a higher risk of developing shoulder pain resulting adverse consequences on their sporting carrier. Despite many therapeutic options the prognosis of the BT still not satisfactory. Surgical procedures carry

complications and cosmetic issues still need to follow the post-surgical rehabilitation procedures. Based on available literature, this is the first RCT in the world to assess the short-term and mid -term effects of Myo-Fascial Release (MFR) compared to conventional physiotherapy rehabilitation program for patients suffering from anterior shoulder pain due to BT.

#### Treatment

Treatment options for this condition include,

- NSAID's
- Steroid injection
- Platelet Rich Plasma Injection (PRP)
- Surgical interventions
- Physiotherapy
- Electrotherapy – Ultrasound therapy, Transcutaneous Electrical Nerve Stimulation (TENS), Shock-wave, Infra - Red (IR) heating
- Exercise therapy – Stretching, strengthening, myofascial release (MFR)

### What is Myofascial release (MFR)?

It is a hands-on technique used to manage myofascial pain. “Myo” means muscle, “Fascial” refers to the connective tissue that covers and supports the muscles (tendons, ligaments, deep and superficial fascia). Each session will last 15 to 50 minutes depending on the duration and the severity of the condition. Therapist will use their hands to massage and stretch the affected myofascial

tissues and eliminate knots and trigger points found along the muscle and the tendon.

Further, it is a form of gentle, constant massage that releases tightness and pain throughout myofascial tissues. It has combination of many different techniques, namely effleurage, petrissage, tapping, hacking, pounding, rolling, trigger-point release and digital ischemic pressure (Figure 5).



**Figure 5: MFR technique**

## **Materials and Methods**

### **Inclusion criteria of the study**

Patients suffering from shoulder condition having symptoms of anterior shoulder pain and the classical point tenderness of LHB in bicipital groove at the arm in 10° internal rotation were selected. The selected patients were double diagnosed clinically by two independent specialist consultants including a rheumatologist and an orthopedic surgeon.

Patients were aged >18 years and < 65 years (to alleviate the bias due to sarcopaenia in old age group).

### **Exclusion criteria of the study**

- Participants who are suspected to be having health conditions around shoulder, such as fracture, malignancy, cervical radiculopathy, polymyalgia rheumatic, bleeding disorders, acute skin infections.
- Patients who have had any form of MFR and or KT therapies within past two weeks.
- Skin allergies to adhesive plaster/ KT.
- Unconsented patients.
- Volunteers understand only Tamil language.
- Any patient having total (TC) and or local (LC) contraindications for MFR.
- Patients suspected to be having or exposed to COVID 19.



Patients were recruited according to the inclusion and exclusion criteria, and they were randomized into groups by systematic random allocation according to clinic registration. If any subject to be having both shoulders diseased, according to the patient's assessment the most severely affected shoulder was considered in the study while both sides having the same treatment protocol.

The sampling method was purposive sampling.

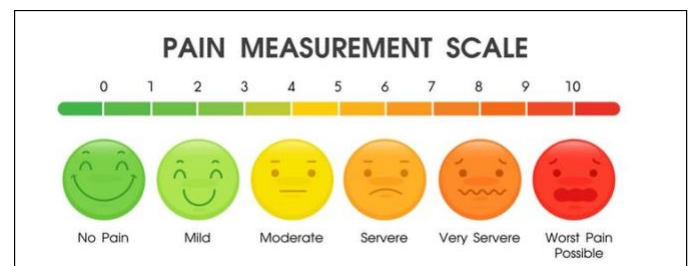
The statistical software G power 3.1 (a free version available on the web) was used to calculate the sample size as it is a well recommended statistical software for optimal sample size calculation for repeated measure ANOVA studies specially when the prevalence is not known.

Sixty patients with long head of bicipital tendinopathy were randomly allocated to control (30) and experimental groups (30). Control group received conventional physiotherapy (electrotherapy and exercise) for 10days, while the experimental group received myofascial release (manually mobilizing, pressing stretching and rolling soft tissues).

In addition, unless found contraindications for the prescribed drugs, all participants were prescribed with standard NSAIDs. Standard drug regimen was Paracetamol 1g BD, Celecoxib 200mg BD, Omeprazole 20mg BD. Baseline measurements was carried out on all subjects by a trained independent person, the clinic nursing officer/physiotherapist to avoid investigator bias on day 01 of the study. Thereafter, the pre-designed intervention therapy sessions were practiced on subjects

according to a planned schedule by the principal investigator. Post-rehab measurements were obtained by the same independent person in all respective instances.

Pain scores and ROM were assessed using a visual analog scale (Figure 6) and digital inclinometer (Figure 7), respectively on days 1, 5 and 10. On each day, measurements were obtained before and after intervention. Data were tabulated and analyzed by using IBM SPSS statistical software version 25. Repeated measure ANOVA followed by Bonferroni post-hoc test performed to find the statistical significance.



**Figure 6: Pain assessment –Visual analog scale**



**Figure 7: Digital inclinometer- with the permission of Hoggan Health Co.ltd USA**

Ethical clearance for the study was obtained from the ethical review committee of the faculty of medicine of University of Ruhuna.

The study proposal has been approved by the Clinical Trial registration (SLCTR) of Sri Lanka Medical Association (SLMA) for the intervention procedures. (SLCTR registration No.2022/002)

## Results

Control group consisted of 8 females and 22 males with a mean age of  $35.1 \pm 15.2$  years. Interventional group consisted of 9 females, 21

males with a mean age of  $34.4 \pm 12.3$  years.

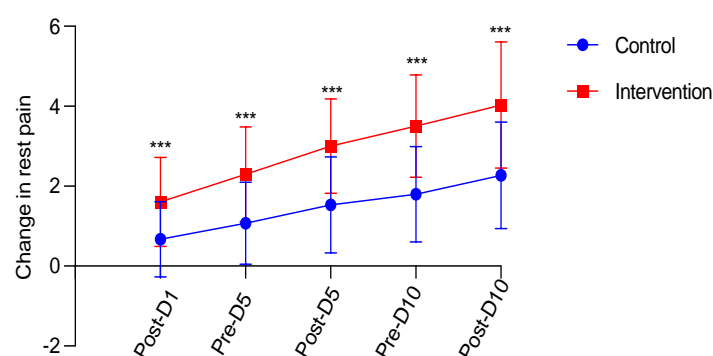
There is no statistically significant difference in mean ages. Mean duration of the condition were  $34.5 \pm 17.5$  days for the Control group and  $35.5 \pm 16.5$  days for the Intervention group.

Rest pain scores for the control group on day 1, day 5, and day 10 (pre- and post-intervention) were  $6.7 \pm 0.29$ ,  $6.03 \pm 0.29$ ,  $5.63 \pm 0.29$ ,  $5.17 \pm 0.24$ ,  $4.90 \pm 0.26$ , and  $4.43 \pm 0.27$ , respectively. The corresponding parameters for the experimental group were  $6.60 \pm 0.35$ ,  $5.00 \pm 0.39$ ,  $4.30 \pm 0.30$ ,  $3.60 \pm 0.26$ ,  $3.10 \pm 0.26$ , and  $2.56 \pm 0.25$ , respectively (Table 2). Both interventions significantly reduced pain scores compared to the baseline.

**Table 2: Pain scores from Day 01 to Day 10.**

Group	Day 1 (Pre)	Day 1 (Post)	Day 5 (Pre)	Day 5 (Post)	Day 10 (Pre)	Day 10 (Post)	Statistical Significance RM ANOVA
Control	$6.7 \pm 0.3$	$6.0 \pm 0.3$	$5.6 \pm 0.3$	$5.2 \pm 0.2$	$4.9 \pm 0.3$	$4.4 \pm 0.3$	$p < 0.0001$
Intervention	$6.6 \pm 0.35$	$5.0 \pm 0.39$	$4.3 \pm 0.30$	$3.6 \pm 0.26$	$3.1 \pm 0.26$	$2.6 \pm 0.25$	$p < 0.0001$

Notably, the experimental group demonstrated a greater reduction in pain score from day 1 to day 10 compared to the control group ( $p < 0.0001$ , RM-ANOVA followed by Bonferroni post-hoc test). Similarly, the change in resting pain from the baseline for each session is visualized in Figure 8. The graph indicates significant improvement in pain with the intervention in each session compared to the control group (Figure 8).

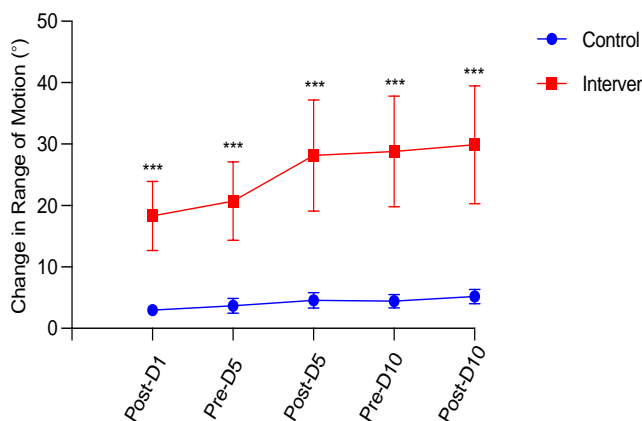


**Figure 8: Change in resting pain from baseline between the control and intervention groups. Indicates  $p < 0.0001$  compared to the control group.**

**Table 3: Change in ROM (forward flexion) from the baseline from Day 01 to Day 10.**

Group	Day 1 (Post)	Day 5 (Pre)	Day 5 (Post)	Day 10 (Pre)	Day 10 (Post)	Statistical Significance RM ANOVA
Control	2.96±0.97°	3.66±1.22°	4.56±1.27°	4.43±1.07°	5.20±1.17°	p < 0.0001
Intervention	15.10±5.37°	16.43±5.51°	20.87±6.66°	22.67±7.41°	23.33±7.71°	p < 0.0001

In the control group, the change in range of motion (ROM) (degrees - °) from the baseline for each session was 2.96°±0.97, 3.66°±1.22, 4.56°±1.27, 4.43°±1.07, and 5.20°±1.17. Conversely, in the experimental group, the corresponding values were 15.10°±5.37, 16.43°±5.51, 20.87°±6.66, 22.67°±7.41, and 23.33°±7.71 (Table 3). Experimental group showed significantly greater improvement in ROM compared to control group at each session (p < 0.001, RM-ANOVA followed by Bonferroni post-hoc test) (Figure 9).



**Figure 9: Change in ROM from the baseline in the control and intervention groups. Indicates p < 0.0001 compared to the control group.**

## Discussion

Rehabilitation of LHB Tendinopathy is challenging for the sports physicians and physiotherapists as it is refractory to most of the conventional treatments available. It is debilitating and dramatically reduces the performance of the athlete specially in throwing and lifting sports. The mechanical entrapment of the LHBT within the bicipital groove and LHB pulley which largely hinders the smooth gliding motion of the fibrocartilaginous part of the LHBT could be the main reason for this spectrum of clinical signs and symptoms. Condition largely managed by the evidence-based practice rather evidence-based methods. Mostly, LHB tendinopathy is overlooked by the adhesive capsulitis and misdiagnosed. The attempt of the study to formulate an evidence-based protocol to rehabilitate LHB tendinopathy while assessing the efficacy of the myofascial release as a front-line physiotherapy option. The preliminary data shows that the MFR is both effective in reducing the rest pain and improving the ROM. Among control group the day 01 rest pain score (6.7 ± 0.30) has reduced to (4.4 ± 0.3) on day 10, by 2.3 which is statistically significant (p<0.0001). In contrary

the interventional group has improved their day 01 rest pain score ( $6.6 \pm 0.35$ ) has reduced to ( $2.6 \pm 0.25$ ) on day 10, by 4.0 which is statistically significant ( $p < 0.0001$ ) according to repeated measure ANOVA.

Comparisons were made on the difference in improvement of the ROM degrees values, from the day 01 pre-treatment ROM (the base line) to post-treatment ROM values on each session. It clearly reflected that in control group the improvement of ROM post-session on each day were considerably lower than that of interventional group. Finally, on day 10 post-treatment, the control group had a ROM improvement of  $5.200 \pm 1.170$  from the baseline ( $p < 0.001$ ). But the interventional group showed a marked improvement of the ROM values soon after each session and on day 10 it was  $22.330 \pm 7.710$  from the base line ( $p < 0.001$ ).

This could be due to the direct effect of the MFR addressing the mechanical entrapment of the LHBT within the bicipital groove and the release of favorable neurotransmitters to alleviate the pain arising from the degenerative tendon (20).

A similar study on tennis elbow in 2019 explored that MFR could improve pain, muscle strength and disability state on Biceps brachii, Pectoralis Major and Latissimus dorsi. The study further suggested that further studies with larger samples in multi-center setting along with follow up can evident more to enhance a new dimension in evidence-based practice for physiotherapy professionals (21).

In 2022 a similar RCT on effectiveness of MFR on rotator cuff muscles found that the

fascial release technique is acutely effective on the pain, ROM and upper extremity functions in the treatment of individuals with rotator cuff arthroscopic repairs (22).

Its justifiable that MFR supersedes the conventional physiotherapy in rehabilitation of LHB tendinopathy by improving the rest pain and forward flexion ROM in greater degree.

Limitation of this study are lack of similar studies to compare with the results of the present study and funding difficulties.

## **Conclusion**

Myofascial release works better than conventional physiotherapy for bicipital tendinopathy as it results in greater improvement of pain and ROM. Further research warrants to explore what could be the exact mechanism by which those improvements were happened.

## **Acknowledgement**

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## **Competing interests**

Authors have no competing interests to declare.

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