



Review Article

Myofascial Release

Salvi Shah^{1*}, Akta Bhalara²

¹Lecturer, SPB Physiotherapy College, Ugat-Bhesan Road, Surat, Gujarat

²Lecturer, Shree Swaminarayan Physiotherapy College, Khambhaliya highway, Jamnagar.

*Correspondence Email: shahsalup@yahoo.com

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ABSTRACT

Myofascial release (MFR) refers to the manual massage technique for stretching the fascia and releasing bonds between fascia and integuments, muscles, bones, with the goal of eliminating pain, increasing range of motion and balancing the body. The fascia is manipulated, directly or indirectly, allowing the connective tissue fibers to reorganize themselves in to a more flexible, functional fashion. The purpose of the myofascial release is to release restrictions (barriers) within the deeper layers of fascia. This is accomplished by a stretching of the muscular elastic component of the fascia, along with the crosslink, and changing the viscosity of the ground substance of the fascia. Evidence shows that MFR is safe, effective and designated to be utilized with appropriate modalities, mobilization, exercise and flexibility programs, neurodevelopment treatment (NDT), sensory integration and movement therapy.

Key words: MFR, fascia, flexibility

INTRODUCTION

Myofascial therapy can be defined as “the facilitation of mechanical, neural and psycho physiological adaptive potential as interfaced by the myofascial system”.^[1]

Fascia is located between the skin and the underlying structure of muscle and bone, it is a seamless web of connective tissue that covers and connects the muscles, organs, and skeletal structures in our body.

Muscle and fascia are united forming the myofascial system.

The purpose of deep myofascial release is to release restrictions (barriers) within the deeper layers of fascia. This is accomplished by a stretching of the muscular elastic components of the fascia, along with the crosslinks, and changing the viscosity of the ground substance of fascia.^[2]

Myofascial release is a collection of techniques used for the purpose of relieving

soft tissue from an abnormal hold of a tight fascia. [3]

Direct bodily effects range from alleviation of pain, improvement of athletic performance, and greater flexibility and ease of movement to more subjective concerns such as better posture. More indirect goals include emotional release, deep relaxation, or general feelings of connection and well-being. Rather than being a specific technique, MFR is better understood as a goal-oriented approach to working with tissue-based restrictions and their two-way interactions with movement and posture. [4]

Fascial system [5]

Fascia is a three dimensional web of connective tissue which runs continuously throughout the body. This fascial continuity means that there is:

- Continuous networking from head to toe,
- Continuous networking from superficial to deep,
- Continuous networking from microscopic to macroscopic.

Therefore, the fascial system is not segmented or divided structurally. However the tissue quality within this single system varies in terms of density and function.

Fascia is composed of an elastocollagenous complex with elastin fibers, and collagen fibers, embedded in a gelatinous ground substance which allows fiber mobility, as well as cellular circulation.

The collagen molecule begins as a fragile protein chain produced in a fibroblast cell. This single protein chain is twisted into a left handed spiral and floats inside the fibroblast until it comes in contact with other two single chains. These three single chains will align and spiral or twist around each other toward the right, consequently increasing its structural strength. This triple helix forms the single collagen molecule. When released from the fibroblast, it migrates through the body's ground substance to the site of injury, infection or

stress. Ground substance is a gel like consistency of raw egg white. It reduces friction between muscle fibers creating ease of motion. These single collagen molecules line up side by side overlapping in a staggered pattern akin to a brick wall. They are attached to each other through a process of hydrogen bonding forming a tough stable fabric.

Throughout once life, fibroblasts retain the ability to migrate any point in the body. They alter their internal chemistry in response to local conditions, manufacturing specific forms of tissue according to needs of the body. Scar tissue is new collagen that has been secreted by ground substance, which is manufactured by fibroblasts, will help determine the way the molecules will join together. The viscosity or density of the ground substance can vary from very thick to watery. The thicker the ground substance, the thicker and less mobile the tissue is. The fascia can be simply described as consisting of three layers.

1. Superficial fascia
2. Deep fascia
3. Subserous fascia

Subserous fascia lines the body cavities and surrounds the organs. It surrounds blood vessels and nerves as well. Here the ratio in the number of fibers to fluid is low, giving it a soft, flexible quality. This is the type of tissue that supports shunts and gastric tubes. The superficial fascia lay directly under the skin. It has a greater ratio of fiber to fluid than the subserous but the fibers are arranged in a loose, irregular lattice pattern allowing for great mobility in all the directions. With long term spasticity the superficial layer losses its mobility, the skin become shiny and taut. This is especially evident in the web space of the thumb in the spastic hand, over the flexor surface of the elbow and the adductor surface of the hip in spastic diplegia.

The deep fascia has a more compact weave with a high fiber to fluid ratio. It has a irregular arrangement of fibers that modify itself depending upon the forces placed on it.

Muscles are embedded in deep fascia. When in the healthy state, this fascia is soft and pliable, allowing the muscle fibers to contract and lengthen efficiently. This same deep fascia, in a more compact form, creates compartment that separate muscle from muscle. It forms regional sheaths or wrapping around the trunk and extremities. It aligns itself in a compact, more orderly and parallel fashion to create tendons and ligaments. The deepest fascia forms the dural tube which surrounds and supports the central nervous system. In children with spasticity the deep fascia also becomes tight.

Myofascial restriction ^[5]

Unwanted bonding may occur with inflammation, injury, postural stress (such as found in cerebral palsy) or lack of full, active range of motion. In an attempt to support the body, the system contracts and bonds to neighboring structures in the same shape and form as the asymmetrical skeleton. Structures that were originally designed to be functionally separate will form adhesions which will impair their ability to slide freely over one another. Where these adhesions develop, individual muscle action is impaired. Adhesions in the neurologically impaired patients develop secondary to the imbalance in postural tone.

Unwanted bonding creates excessive deposits of tissue. This results in thick bandaging around joints, fibrous masses, along with tough fibrotic ropes and cysts in the muscle bellies.

Myofascial restriction weakens the muscle and holds the skeleton in an inefficient alignment, altering the kinesiological angle of pull. Excessive deposits of connective tissue correlate with areas of spasticity. Adhesions branch out to neighboring structures from these central points.

Unwanted bonding can be the results of faulty muscular activity. The child with fluctuating tone holds and braces posturally in an effort to grade the range and speed of movement. Over time, these holdings and

bracing patterns encourage the development of myofascial restriction.

The patterns of fascial restriction are like an historical account of the patients adoptions to gravitational forces. When using myofascial release, the therapist alters the density of the ground substance, thus allowing the collagen fibers to separate. The therapist gently lengthens the fibers, following the release of associated restriction throughout the body. Keep in mind that the elastin allows the tissue to return to its original form and flexibility, thus returning the skeleton to proper biomechanical alignment. As we add graded movement the patients immediately learns to use this new mobility, carrying it over into functional skills. Combining the concepts of myofascial release and neuro-development treatment allows the patients to let go of the past and move forward towards independent functions.

Concepts in Myofascial release technique ^[6]

The **first concept** in this system is that of tight loose. This concept is tightness creates and weakness permits asymmetry. There are both biomechanical and neural reflexive elements to this tight loose concept. Increased stimulation causes an agonist muscle to become tight, and the tighter it becomes, the looser its antagonist becomes by reciprocal inhibition. Shortening of the fascia surrounding the hypertonic, contracted muscle requires loosening of the fascia in the opposite direction in accommodation. In acute condition the cycle can be described as continuing spasm- pain-spasm. This results in tightness and can progress from the acute condition of the muscle contraction to actual contracture of the muscle leading to chronicity. In chronic condition the cycle is described as pain-looseness-pain. The application of the tight loose concept is fundamental to the therapeutic use of the MFR.

The **second concept** is that of the role of the palpation in myofascial pain syndromes. There are many diagnostic and therapeutic systems built upon peripheral stimulation. Palpation of the myofascial elements can frequently identify a safe site of initiation for myofascial pain which can be therapeutically addressed by the hands. A significant proportion of the myofascial sensitivity appears to be mediated by the autonomic nervous system; some of the symptoms found with myofascial pain are probably mediated by sympathetic nervous system reflexes. It is interesting to note the frequent occurrence of myofascial pain in areas of soft tissue looseness.

The **third concept** deals with the neuroreflexive change that occurs with the application of manual force on the musculoskeletal system. The hands on approach offers afferent stimulation through receptors, which require central processing at the spinal cord and cortical levels for a response. Afferent stimulation frequently results in efferent inhibition. This principal is used in MFR technique when the afferent stimulation of a stretch is applied and the operator waits for efferent inhibition to occur so that relaxation results in tight tissue. Neuroreflexive response is individualistic and appears to be modified by the amount of pain, the patient's pain behavior the level of wellness, stress response and basic life style of the individual, particularly the use/abuse of alcohol, tobacco and drugs including medications.

The **fourth concept** is that of the "release" phenomenon. This concept is shared with other forms of manual medicine; particularly the cranio sacral technique and the ease bind principle of functional indirect technique. Release, in MFR concept, is the tissue relaxation, which follows the appropriate application of stress on the tissue. The tightness "gives way" or melts under the application of the load. Release becomes an enabling and terminal objective of the application of MFR. Release of

tightness is sought to achieve improvement in symmetry of function and form.

Technique of Myofascial Release^[5]

Making contact

The process is begun by placing one hand on the patient. Enough pressure should be applied to take up the slack in the skin. The pressure should be directed towards the supporting surface. The skin underlying the tissues should be felt like soft cushion. The body's connective tissue responds to pressure, traction (stretch) and the friction they generate. Therapist's touch increases body temperature and the energy level of the tissue, creating a greater degree of fluidity to the system.

Evaluating for fascial mobility and tone

The examiner then slightly tracks the skin and assesses the mobility of the tissues superiorly and then inferiorly, medially and then laterally, clock wise then counter clock wise. Comparisons can be made regarding the direction of ease and greatest motion. In one of the direction therapist may sense an abrupt end to the tissue range, as if therapist running in to a wall, a fascial barrier.

The tone or quality of each person's connective tissue is unique. The quality of the tissue will vary on different parts of the same body. Restricted tissue feels sluggish when moved. The tissue is dense and may feel dry, since the ground substance is less fluid.

Step I: Getting Ready

The therapist's hands should be placed on the body using a light amount of pressure. Then lengthening of elastic component of the tissues should be done until palpation of first barrier or end range. Sufficient traction should be maintained to hold the tissue at its end range. Focus should be on traction rather than on the pressure. Traction should be held for at least 90 to 120 seconds before the tissue will begin to soften and lengthen. Therapist should relax the shoulders and gently lean in to the traction. Since the therapist's pressure and traction create friction deep within the connective

tissue structure, build up of heat or a tingling, fluttering sensation may be felt. This feedback often occurs just prior to the release.

Step II: The lengthening processes

As the tissue begins to soften and lengthens, the barrier slowly fades. Therapist will find himself making automatic adjustments in traction and pressure as the tissue releases. These adjustments are rarely based on preconceived logic. Rather, the tissue, at a subtle proprioceptive level, seems to pull in or push out based on its need. Therapist should trust what he is feeling and respond to it.

Following the tissue as it lengthens:

As the therapist moves through the first barrier, he should follow the tissue rather than forcing it in a predetermined direction. The therapist will follow the tissue wherever it goes, resisting its tendency to shorten again. As the tissue lengthens itself from surrounding structures it may get caught in a loop or repetitive pattern. By gently holding the traction steady the repetitive patterns can be resisted. It will then begin to release in a new direction. While moving through many barriers, therapist should wait at each barrier, with patience. The therapist should ensure that his shoulders and neck are relaxed. Therapist may shift body weight and reposition himself, ensuring that the traction is maintained.

Step III: Completion

When movement or creep subsides or when meeting the end of an area for hand placement therapist may come off the body.

Removal of hand placement should be accomplished slowly. Tissue mobility and range of motion should be reassessed.

Step IV: postural integration

Follow up after MFR should be done with guided antigravity motion. The therapist guides body in motion in a way that encourages the patient to use new alignment and new available ROM.

Types of MFR ^[7]

MFR refers to soft tissue manipulation techniques. It has been loosely used for different manual therapy, soft tissue manipulation work (connective tissue massage, soft tissue mobilization, Rolfing, strain-counter strain etc.)

1. Direct myofascial release
2. Indirect myofascial release
3. Self myofascial release

Direct myofascial release

The direct MFR method works directly on the restricted fascia. The practitioners use knuckles, elbows, ulnar border of the hands, fist or other tools to slowly sink in to the restricted fascia applying few kilograms force or tens of Newton and stretch the fascia. (Figure I) This is sometimes referred to as deep tissue work. Direct MFR seeks for changes in the myofascial structures by stretching, elongation of the fascia, or mobilizing adhesive tissues. There can be misconception that the direct method is violent and painful. It is not essentially aggressive and painful, as the practitioner moves slowly through the layers of the fascia until the deep tissues are reached.



Trapezius



Planter surface of foot

Figure I : Direct myofascial release

Technique of direct MFR

- Land on the surface of the body with the appropriate “tool” (knuckles, or forearm etc)
- Sink in to the soft tissue.
- Contact the first barrier/restricted layer.
- Put in a “line of tension”.
- Engage the fascia by taking up the slack in the tissues.
- Finally move or drag the fascia across the surface while staying in touch with the underlying layers.
- Exit gracefully.

- Maintain a light pressure to stretch the barrier and wait for approximately 3-5 minutes.
- Prior to release, the therapist will feel a therapeutic pulse (Heat).
- As the barrier releases, the hand will feel the motion and softening of the tissues.
- The key is sustained pressure over time.

Indirect myofascial release

The indirect method gentle stretch, the pressure is in few grams, the hands tend to go with the restricted fascia, hold the stretch, and allow the fascia to “unwind” itself. The gentle traction applied to the restricted fascia will result in heat, increase blood flow in the area. The intension is to allow the body’s inherent ability for self correction returns, thus eliminating pain and restoring the optimum performance of the body.

Technique for indirect MFR

- With relaxed hand lightly contact the fascia and slowly stretch the fascia until reaching a barrier restriction.

Self myofascial release

Self myofascial release is when the individual uses a soft object to provide MFR under their own power. Usually an individual uses a soft roll, or ball(tennis ball, soccer ball) on which to rest one’s body weight, then, by using gravity to induce pressure along the length of the specific muscle or muscle groups, rolls their body on the object, slowly(1-2 seconds an inch), allowing for the fascia to be massaged.(Figure II) Upon any sharp pain, individual must back up and hold the position, so as to not force undue stress upon the fascia and muscle. By holding the roll just before the pain, it allows the myofascial time to relax and release before continuing through the roll. If the pain does not go away, one may have to use a softer object.



Body is positioned prone with quadriceps on foam roll. It is very important to maintain proper Core control (abdominal Drawn-In position & tight gluteals) to prevent low back compensations. Roll from pelvic bone to knee, emphasizing the lateral thigh

Quadriceps

Figure II: Self myofascial release ^[8]

Benefits of self-myofascial release

1. Correct muscle imbalances
2. ↑ Joint range of motion
3. ↓ Muscle soreness & relieve joint stress
4. ↓ Neuromuscular hyper tonicity
5. ↑ Extensibility of musculotendinous junction
6. ↑ Neuromuscular efficiency
7. Maintain normal functional muscular length

Reactions to myofascial release ^[9]

When utilizing myofascial methods for improving mobility of the structures symptoms may occur in the patient. These reactions to the tissue unwinding express themselves in several ways. The following is a short list of possible reactions, which may occur during of the following the treatment.

1. Vasomotor reactions to the elongation of the tissues may occur. The skin may flush and redness may be observable. The pattern of distribution of this reddening may travel beyond the placement of the hands. Vasomotor responses may indicate other area of possible restriction.
2. The perception of increased flow of energy in tight area, which is releasing. The therapist or the patient may experience the perception of a buildup of heat from the area, a throbbing or vibration in the tissues or a pulsation below the hand. The patient may describe itching, pulsing, or burning sensation, which has a crescendo or a rise and fall.

3. The patient may experience an autonomic nervous system response such as becoming light headed, change in body temperature or hear rate. Respirator cycles also may change during the process. These changes are temporary in reaction to the tissues opening and will reside momentarily. Caution should be taken to not to move quickly if these reactions are occurring.
4. Muscular soreness may result from the tissue lengthening. This should be less than is experienced through traditional stretching. Encourage the patient to drink water to flush the system of any release of toxins through the tissues opening up.
5. The patient may demonstrate an emotional reaction to the physical release of the tissue. This may be observed in the form of laughter, sadness, expression of anger or fear by the patients. It is important to respect your patient individual reactions during this period of tissue release. You should supportive during the session as a natural part of being with your patient.

Myofascial release treatment can help in ^[10]

1. Chronic pain
2. Backache and pelvic imbalance
3. Neck & shoulder pain & tension
4. Headaches
5. Jaw discomfort, teeth grinding & clenching
6. Sciatica
7. Carpal tunnel syndrome

8. Tennis & golfer elbow
9. General discomfort & muscular spasm
10. Trigger point formation
11. Muscle tightness and muscle spasticity
12. Dizziness & vertigo
13. Menstrual discomfort
14. Fibromyalgia
15. Planter fasciitis
16. Sports injuries
17. Frozen shoulder
18. Whiplash
19. Post surgical & injury scarring

Myofascial release treatment can also

1. Increase energy
2. Restore muscular function and postural alignment
3. Relieve physical and emotional strain
4. Increase awareness of holding and bracing patterns
5. Promote relaxation
6. Balance the body, mind and soul
7. Promote self healing

Precautions ^[11]

Precautions should be taken in the following conditions:

1. Osteoporosis: Use gentle pressure.
2. Hypotonia: when elongating tissue follow with control as tissue tightness may some structural stability.
3. Athetosis: Tissue tightness may be used to give integrity to structure and lengthening of the tissue should be followed with activation of placing, holding and slow controlled movements.
4. Scar tissue release: should be provided slowly and over time in order for the comfort of the patient.
5. Breathe Holding and disorganized swallowing patterns: demonstrate a loss of holding pattern, disorganization in control and possible resistance in the client. The release may be frightening to the

child and they may attempt to hold their body stiff or hold their breath. Slow progression is the key and maintaining a safe environment. When swallowing becomes disorganized follow up with head and neck activation. When breath holding occurs gently remind the child to breathe in.

6. When approaching a patient the therapist should not demonstrate intent to stretch the tissue. The approach should be supportive with a slow onset and termination of the method .The goal of using this method is to permit the natural creep of the connective tissue to allow for elongation of the tissues under our sustained touch.

Contraindications ^[11]

Avoid MFR during the following conditions

1. Febrile states
2. Systemic or localized infections
3. Surgical incisions and open wounds
4. Healing fractures
5. Acute inflammation-Rheumatoid conditions
6. Cancer or tumors conditions
7. Aneurysm
8. Anti coagulant therapy
9. Osteoporosis or advanced degenerative changes
10. Hypersensitivity to skin
11. Advanced diabetes

Evidence for MFR use

There is no scientific evidence to support the use of rolfing (MFR) for any medical condition. ^[12]

The idea that a rolfer can apply force to fascia and lengthen it and remove tension is completely false. ^[13] (Grimm 2007)

In 2004, a systematic review found that there is no evidence-based literature to support rolfing in any specific disease group. ^[14] (Jones 2004)

In 2008, a systematic review was unable to find any evidence demonstrating

the efficacy of myofascial release whatsoever. Just like rolfing, there was a complete lack of evidence basis to support its use. [15] (Remvig 2008)

SUMMARY

Myofascial Release is a very effective, gentle and safe hands-on method of soft tissue mobilization, developed by John Barnes that involves applying gentle sustained pressure to the subcutaneous and myofascial connective tissue. The goal of myofascial release is to release fascia restriction and restore its tissue. This technique is used to ease pressure in the fibrous bands of the connective tissue, or fascia. Gentle and sustained stretching of myofascial release is believed to free adhesions and softens and lengthens the fascia. By freeing up fascia that may be impeding blood vessels or nerves, myofascial release is also said to enhance the body's innate restorative powers by improving circulation and nervous system transmission. This low load sustained stretch gradually, over time, allow the myofascial tissue to elongate and relax, thus allowing increased range of motion, flexibility and decreased pain.

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