

Touching the pain לגעת בכאב  
החברה הישראלית לרפואת שריר שלד  
The Israeli Society of Musculoskeletal Medicine

THE ISRAELI SOCIETY OF MUSCULOSKELETAL MEDICINE

12<sup>ème</sup>  
CONGRÈS NATIONAL  
de la SOFMMO

**FOREFOOT PAIN**

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Today we'll speak about forefoot pain and the causes for that. Help me, please, understand what are your professions. Are family physicians here? Raise your hands. Orthopedic Surgeons? Physical therapists? Chiropractors? Osteopaths? Other professions? What's your profession? So, let's begin.

### Mrs. Mary Smith



- ✓ 45 years old, M + 3, works as a salesperson
- ✓ Generally healthy, doesn't smoke
- ✓ History of one month pain in her right forefoot
- ✓ The pain feels pressing and sharp
- ✓ Worsened by walking
- ✓ No night pain or systemic symptoms
- ✓ Diclofenac, Tramadol, Paracetamol and cold ankle applications didn't help

Prior to pain onset, she was on a journey in the mountains

לגעת בכאב Touching the pain 

So, let's begin from a case report of Mrs. Mary Smith. 45 year old female, married with 3 children, works as a salesperson. Mary is generally healthy, does not smoke, does not exercise. However during the last month she's suffering from pain of her right forefoot. The pain is pressing and sharp, worsened by walking. The pain does not wake from sleep. Mary has no other complaints or systemic symptoms. Treatment by Diclofenac, Tramadol, Paracetamol and cold local topical applications did not help her. Mary remembers, that prior to pain onset, she made a mountain trip with her family.

When you ask the patient to point to the painful region, she points to the anterior aspect of ankle and dorsum of her right foot.

On physical examination we do not find contractures, skin changes or signs inflammation, local palpation of the medial region from mid dorsal line of the ankle and the tarsal area causes her pain. In addition, range of motion is restricted on plantar flexion of the ankle, and weakness on dorsal flexion of the ankle. Resisted dorsal flexion with inversion of the foot is painful.

## DIFFERENTIAL DIAGNOSIS

✓ Myofascial Pain Syndrome of  
Tibialis Anterior Muscle  
or  
other muscles of anterior leg

What is the differential diagnosis in this case? What do you think? Any more opinions?/// Thank's. In the history and physical examination we will refer to and examine, whether there are signs of: - **Injury**: same as Ankle, metatarsal or big toe fractures, ankle or metatarsophalangeal joint sprains, big toe dislocation. - **Are there any Mechanical problems**? Same as Hallux valgus or rigidus, metatarsalgia, corns, calluses. - **Is there Arthritis**? Same as gout, rheumatoid arthritis. - **IS there Infection**? Same as diabetic ulcer, osteomyelitis. - **Are there signs of Neuropathy**? Same as lumbar radiculopathy ( L5 ), neuropathy of peroneal nerve. - **Is there a Cutaneous condition**? Same as dermatitis, ingrown toenail. - We will also consider and examine for the most common cause of forefoot pain: Myofascial Pain Syndrome of the Tibialis Anterior muscle or other muscles of the anterior leg.

## Objectives :

### **Tibialis Anterior Muscle Myofascial Pain**

#### **Clinical Approach and Management:**

- ✓ Referred Pain Patterns
- ✓ Anatomy
- ✓ Function
- ✓ Symptoms
- ✓ Trigger Points - *Activation & Perpetuation*
- ✓ Physical Examination
- ✓ Dry Needling
- ✓ Stretch Exercises and Self Therapy
- ✓ PRACTICE !



In the context of the Myofascial Pain Syndrome of the Tibialis Anterior muscle we will talk about: - Referred Pain Patterns of the Tibialis Anterior . - Anatomy and function of the Tibialis Anterior muscle. - Symptoms of the Tibialis Anterior Myofascial Pain Syndrome . - What are the reasons for Tibialis Anterior Myofascial Pain Syndrome . - Physical Examination and treatment by Dry Needling of the muscle. - Stretch Exercises and Self Therapy for tibialis anterior muscle. - At the end of the session, each one of you will practice recognition and palpation of the muscle and dry needling.

## TIBIALIS ANTERIOR MUSCLE

### *Somatic Referred Pain Pattern*



> **REFERRED PAIN**

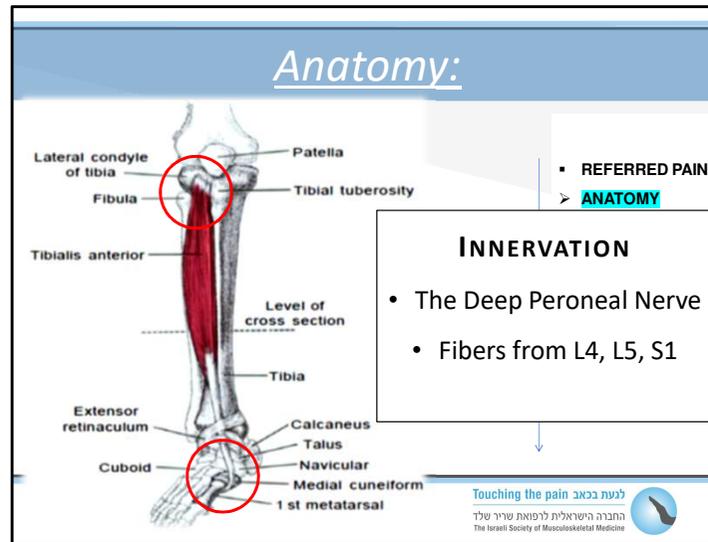
- ANATOMY
- SYMPTOMS
- DDX
- MTRPS
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- DRY NEEDLING
- STRETCH
- PRACTICE !

לגעת בכאב *Touching the pain*

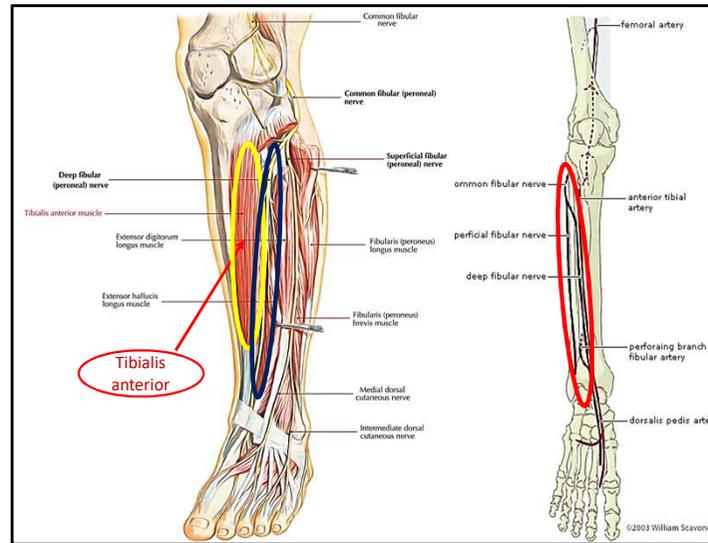
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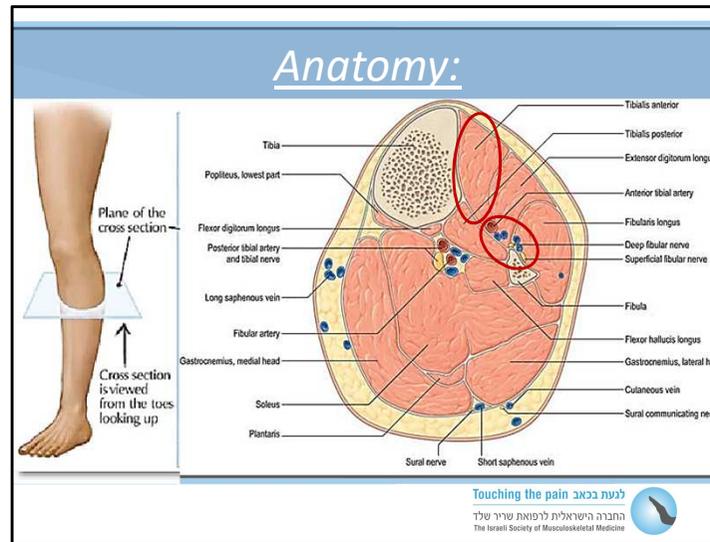
Let's see what are the Referred Pain Patterns of Tibialis Anterior Myofascial Pain Syndrome . The pain may be local over the Tibialis Anterior muscle area, referred to the anterior ankle, the dorsum of the foot or the big toe.



A little bit about anatomy of this area. Head of tibialis anterior muscle is found above lateral aspect of tibial bone, proximal end of the muscle attaches to the lateral tibial condyle and distally the muscle attaches to the medial cuneiform bone and 1<sup>st</sup> metatarsal bone. Your attention: the Tibialis Anterior muscle crosses only one joint.



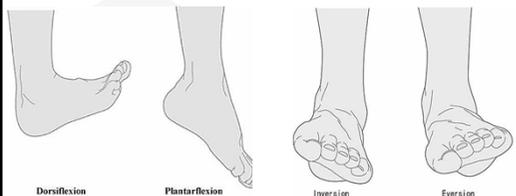
The Peroneal nerve and Tibialis Anterior artery and vein are found in anterior leg. The Tibialis Anterior muscle is located medial to these structures.



We can see it here on a transverse section: the Tibialis Anterior muscle is lateral to the Tibia, while the Nerve and blood vessels are further more lateral and posterior(deeper). Topographic anatomy helps us in choosing the safe area for manual and dry needling treatment.

### Function of the Tibialis Anterior muscle

- Dorsiflexion of foot
- Inversion of foot



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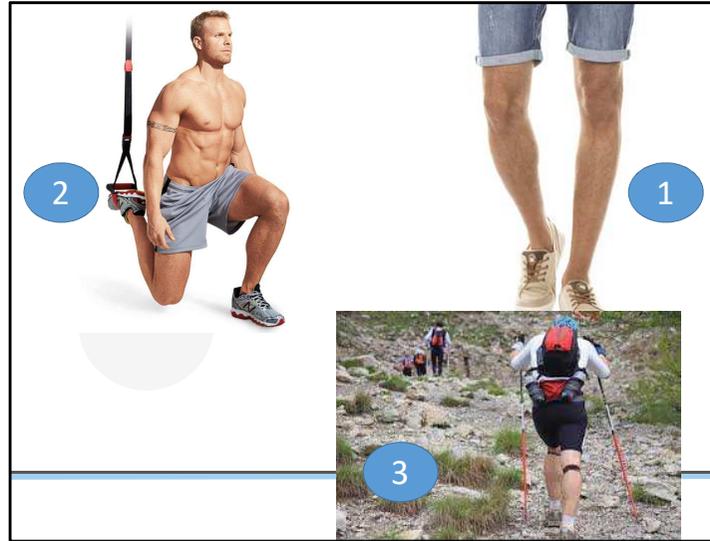
What is the function of the Tibialis Anterior muscle? What do you think? Any more opinions?/////

Right. The Tibialis Anterior muscle dorsiflexes and inverts the foot.

Symptoms:  
Tibialis Anterior Myofascial Pain Syndrome

- **Chief complaint : Pain on the Anteromedial Aspect of the Ankle and in the Big Toe.**
- Weakness of dorsiflexion when walking
- Dragging of the foot
- Tripping and falling
- General weakness of the ankle

When the Tibialis Anterior muscle is constricted and suffering, it may cause: - **Pain of the Anteromedial Aspect of the Ankle and in the Big Toe.** - weakness of dorsiflexion while walking. - dragging of the foot. - tripping and falling. - general weakness of the ankle.



Here are three pictures of people with different calves. What do you think: which one will develop Tibialis Anterior Myofascial Pain Syndrome?///// All of them ! You are correct.

### MTrPs: Activation and Perpetuation

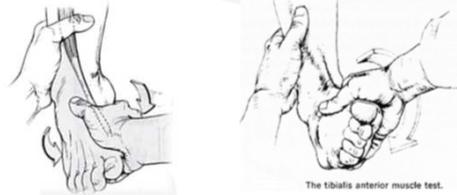
- Sustained contraction
- Immobility
- Sprain or fracture
- Compromised circulation
- Walking on rough ground or slanted surface

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Why? what are the causes of Tibialis Anterior Myofascial Pain Syndrome? Sustained contraction, such as when mountain climbing or during intensive training of the muscle. - Weakness of Tibialis Anterior muscle or immobility of the ankle. - After an ankle sprain or fracture. - Vascular compromise of the muscle. - Walking on rough ground or slanted surface. All these are potential causes of Tibialis Anterior Myofascial Pain Syndrome. Now we will pass to the practical part, and I invite my colleague doctor Robert Satran.

*Physical examination of Tibialis Anterior muscle:*



*Passive Stretching & Resisted Activation*

**Painful !**

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On physical examination, stretching the muscle by gentle passive plantar flexion and eversion can be limited and painful. Resisted activation of the muscle, as the patient dorsiflexes and inverts the foot against resistance will also be painful.

*Physical examination of  
Tibialis Anterior muscle:*

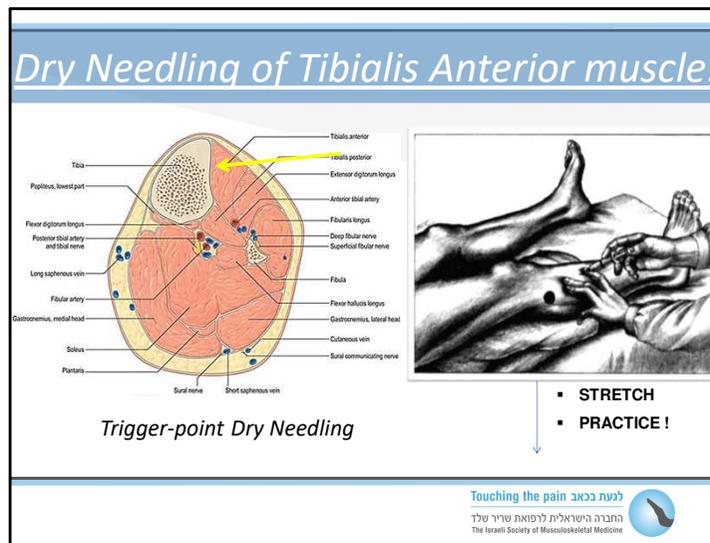


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*Trigger-point and/or taut band palpation*

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Palpation of the muscle. Muscle is lateral to the anterior tibial surface. Palpate for taut bands perpendicular to the direction of the muscle fiber. When a taut band is identified, palpate parallel to the direction of muscle fibers along the taut band and try to locate tender trigger points (painful spots along the taut band). Pressing these spots may cause local as well as referred pain that the patient can recognize as his pain – thus you are literally **Touching the Pain** !



The taut band is fixated under two fingers and the needle is inserted inbetween. The needle is always inserted perpendicular (90 degrees) to the skin surface. After needle insertion, move the handle down so that the needle is now parallel to the floor plane (Frontal plane). The needle is then advanced through the muscle tissue until the tibial bone is met. Thus we know we are in the safe zone and we have reached deeper fibers with potential trigger points that cannot be palpated. The needle is then retracted back to the area beneath the skin and the angle is slightly changed to the left or right while remaining in the same plane parallel to the floor (frontal plane). A local twitch response along the taut band may be felt while needling, signifying the release of a trigger point.

## Stretch

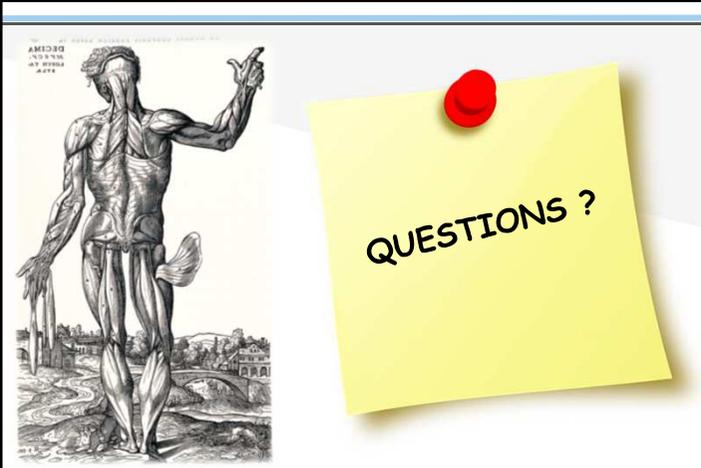
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After needling local pressure over the treated point for several seconds can prevent bleeding and hematomas and help ease pain.

Inform the patient about post needling soreness of the treated area that is expected to improve in a few hours to a day or two.

Instruct the patient about stretching to muscle as well as local massage to augment treatment effectiveness.



QUESTIONS ?

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## PRACTICE !

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