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Review

Stratum of fascial tissue of the lower limb

Elayne Cristina de Oliveira Ribeiro[1], José Jailson Costa do Nascimento[2], Daniel Maurício Pereira Barros[2], Rayssa Gomes Santos Palmeira[2], Marcelo Moraes Valença[1], Eulâmpio José da Silva Neto[2]

[1]Programa de Pós-graduação em Ciências Biológicas da UFPE, Recife, PE, Brasil
[2]Universidade Federal da Paraíba.

Elayne Cristina de Oliveira Ribeiro
elayne.oribeiro@ufpe.br

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Juliana Ramos de Andrade

Fascia is a connective tissue that covers all the muscles in the human body, except the muscles of facial expression. In addition, fascia groups muscles into functional compartments, allows muscle attachment, and assists in venous drainage. The lower limb fascia is attached to bony elements of the pelvis, knee, ankle, and foot, thus participating in the dynamics of skeletal movement.

In this dissection, the fascia arrangement was observed in three extracts, which showed condensations of connective fibers, arranged in a superficial transverse fascia layer and two deep oblique layers. These fibers changed from the oblique to the longitudinal direction as their length increased. The fibers were attached to the bones either directly or through the fascial septa. Layers were observed in the following locations: iliotibial tract region; site of passage of nerves that run through the fascia from deep to superficial, traversing a relatively long tunnel.

The lower limb fascia is usually thicker in young people than in the elderly. This is most evident in the anterior and posterior crural fascia and anterior thigh fascia, which may be related to greater muscle mass.[1] In the elderly, a large amount of adipose tissue can also be observed below the fascia lata and iliotibial tract.[2]

The superficial fascia extract located in the region of the iliotibial tract was constituted by fibers in the oblique direction, in the proximal third, and by fibers in the transverse direction, in the middle and distal thirds (Fig. 1). Below the superficial extract there was a tunnel through which neurovascular structures did not cross (Fig. 2). On the posterior wall of the tunnel, two juxtaposed oblique fiber extracts were observed (Fig. 3). The short fibers tended to be oblique and presented a longitudinal arrangement as they elongated (Fig. 4). In some regions, the fibers lost their continuous tissue character and became individualized (Fig. 5).

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On the anterolateral aspect of the leg, the superficial fibular nerve courses from deep to superficial, and from proximal to distal through the layers of the crural fascia (Fig. 6). The arrangement of these fibers was similar to those located in the region of the iliotibial tract. This greater and denser number of fascicles of collagen fibers in the anterior crural fascia provides greater pressure on this compartment, which may facilitate to compartment syndrome.[3]

Fascial expansions were also observed in the upper limb communicating different regions. For example, the expansion of the biceps brachii reaches the fascia of the forearm in the bicipital aponeurosis. Thus, there is continuity between all muscles in the flexor compartment of the upper limb, in which expansions can help to inform the contraction of a distal muscle in relation to a proximal one.[4]

Therefore, these fibers arranged in different directions must possibly be related to force vectors that help in the functionality of the fascia.

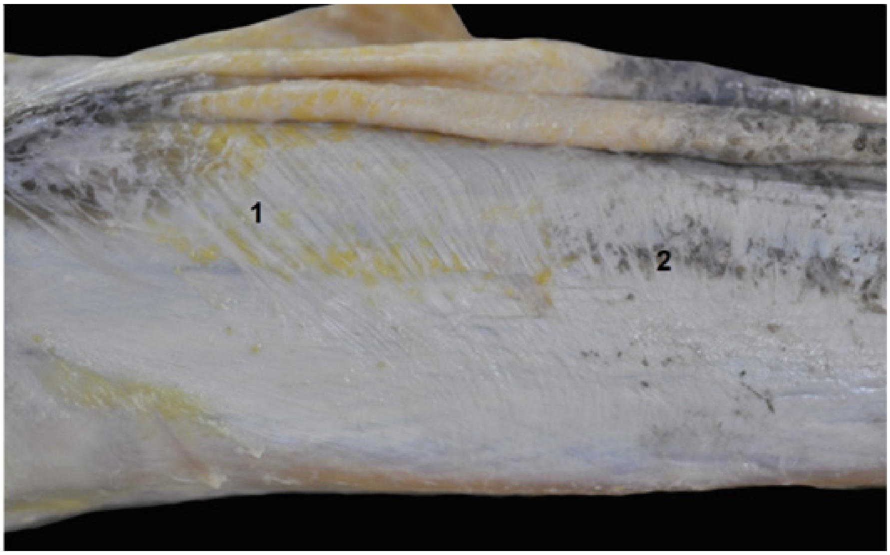

Figure 1. Superficial layer of the lateral thigh fascia. 1. Proximal oblique fibers; 2. Distal transverse fibers.

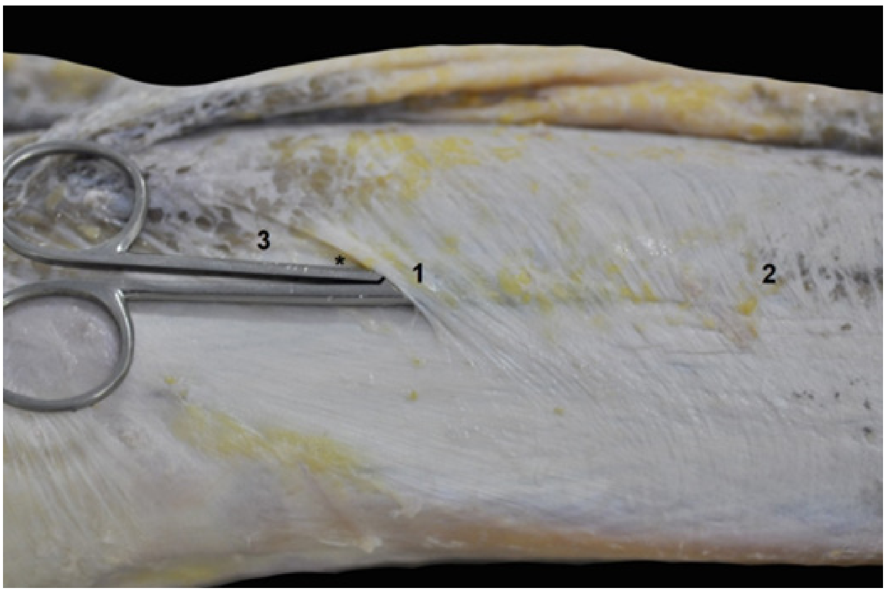

Figure 2. Fascial tunnel between the superficial and deep layers. 1. Oblique fibers; 2. Transverse fibers; 3. Deep longitudinal oblique fibers; *Tunnel occupied by scissor.

Figure 3. The surface layer (tunnel roof) was folded back, allowing the visualization of the deep oblique layers. 1. Folded surface layer; 2. Oblique fibers of the middle layer; 3. Oblique fibers of the deep layer.

Figure 4. Visualization of the deep fibers. 1. Folded surface layer; 2. Short fibers of the middle layer; 3. Middle layer long fibers; 4. Deep layer.

Figure 5. Isolated layers. 1. Folded surface layer; 2. Short fibers of the middle layer; 3. Middle layer long fibers.

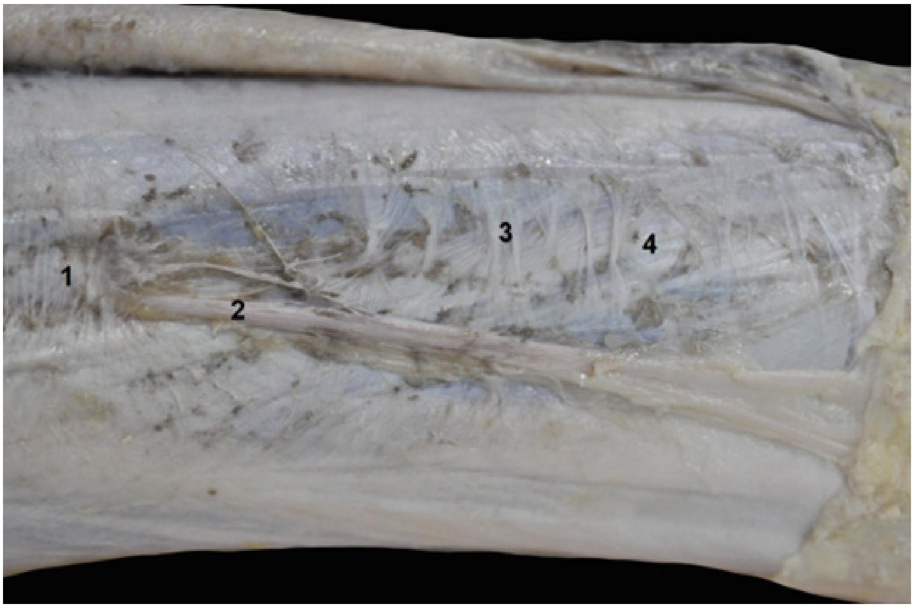

Figure 6. The course of the superficial peroneal nerve in the distal part of the leg. 1. Surface layer; 2. Superficial peroneal nerve; 3. Middle layer; 4. Deep layer.

Authors contribution:
ECOR,substantial contributions to the concep or design bf the work; drafting the work; interpretation of data forthe work. JJCN, revising it critically for important intellectual content; final approval of the version to be published. DMPB,revising it critically for important intellectual content; final approval of the version to be published. RGSP, final approval of the version to be publi 1 and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy. MMV, final approval of the version to be pub agreement to be accountable for all aspects of the work in ensuring that related to the accuracy. EJSN,substantial contributions to the concep and acquisition of the work: revising it critically for important intellectual content; final apprpved of the version to be published.

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Elayne Cristina de Oliveira Ribeiro
https://orcid.org/0000-0002-5243-3356
José Jailson Costa do Nascimento
https://orcid.org/0000-0002-0365-665X
Daniel Maurício Pereira Barros
https://orcid.org/0000-0003-4587-9920
Rayssa Gomes Santos Palmeira
https://orcid.org/0000-0002-1330-2409
Marcelo Moraes Valença
https://orcid.org/0000-0003-0678-3782
Eulâmpio José da Silva Neto
https://orcid.org/0000-0001-9750-3832

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