Published online: 2019-06-28

THIEME OPEN ACCESS

Sonographic Approach of the Lumbar Portion of the Psoas Muscle

Abordaje ecográfico de la porción lumbar del músculo psoas

Jaime Ríos Serra[1] Ana de Groot Ferrando[2]

[1] Clínica Serra, San Vicente del Raspeig, Alicante, Spain
[2] Campos Fisioterapia, Alicante, Spain

Address for correspondence Jaime Rios, Clínica Serra, San Vicente del Raspeig, Alicante, España (e-mail: jaimerios_19@hotmail.com).

Rev Fisioter Invasiva 2019;2:46–47.

Introduction

The deep part of the psoas major muscle originates from the transverse processes of lumbar vertebrae L1 to L5, whereas the superficial part originates from the lateral surfaces of the T12 vertebral body. The muscle descends, crossing the anteromedial portion of the vertebral bodies, and, at the level of the pelvis, it joins the iliacus muscle, forming the iliopsoas muscle and inserting onto the lesser trochanter of the femur. This is the only muscle that inserts at this site, and it is innervated by the branches from the ventral rami of L1 to L4, which correspond to the crural nerve.

The iliopsoas is involved in dynamic movements such as walking and is important for the maintenance of static standing. Its primary functions include producing hip flexion (with a fixed trunk) and lumbar extension by increasing the lordosis (when the muscle contracts with fixed legs, the anterior pelvic tilt increases).[1–4] Besides, this muscle has a stabilizing role for the hip and lumbar spine.[5–11] The function of the same cannot be recognized as being separate from the iliacus muscle, as demonstrated via electromyography.[12]

The aim of this study was to demonstrate a new approach for locating the muscle to enable a sonographic assessment of the lumbar origin of the psoas muscle, beginning with a basic examination in the groin region. Moreover, we sought to establish an accessible and safe sonographic approach to enable us to assess a portion of the psoas muscle, which has been poorly studied to date. Hence, this may help establish a possible evolution of lesions affecting this muscle.

This sonographic description may be relevant within the field of physiotherapy as it is an approach that is seldom used. Additionally, it provides useful information regarding the quality of the contraction of the psoas muscle along its path besides detecting changes that affect the size of the same and possible alterations in its cortical insertions. Ultimately, it allows clinicians to detect any asymmetries, as comparisons can be performed with the other psoas muscles. This can expand our sonographic assessment of this muscle.

Case in Images

Patient Position

The patient is placed in supine position, lying with the knee extended and the arms on either side of the body to ensure a good approach from the anterior aspect of the hip to the abdominal region. The probe is placed transversely over the muscle fibers. (►**Fig. 1**)

Optimization, Probe Position and Sonographic Image

For an appropriate examination of the iliopsoas muscle, a low frequency range is established (6–10 MHz), which should be determined according to the volume of the body mass of the subject. To visualize the iliopsoas, the position of the probe should be transverse to the fibers (►**Fig. 1**). In this manner, we must first locate the anterosuperior iliac spine as a reference and visualize the difference between the psoas and iliacus muscles[13] (►**Fig. 2**). Based on this reference image, we should continue the examination, taking the probe upwards, trying to clear the 'dirty' shadow generated by the bowel loops, until the psoas is visualized in the transverse section of L4, which is at the height of the umbilicus, and, in this manner, the muscle can be bilaterally compared along its muscle belly (►**Fig. 3**)

From this position of reference, a scan is performed in a proximal direction, during which we will ask the patient to flex the hip with the knee extended, to visualize the entire muscle belly, until reaching D12- L1.

Discussion

With this approach, we hope to broaden the range of sonographic applications for the assessment of this highly

DOI https://doi.org/10.1055/s-0039-1688507.
ISSN 2386-4591.

Copyright © 2019 by Thieme Revinter Publicações Ltda, Rio de Janeiro, Brazil

License terms

Fig. 1 Placement of the probe.

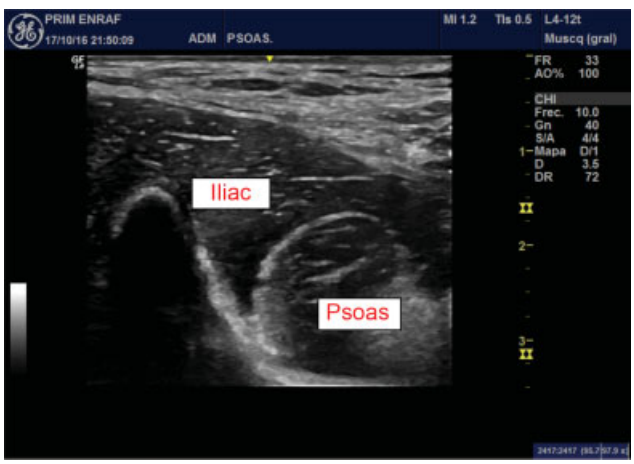

Fig. 2 Sonographic visualization of the psoas fibers and the iliacus muscle.

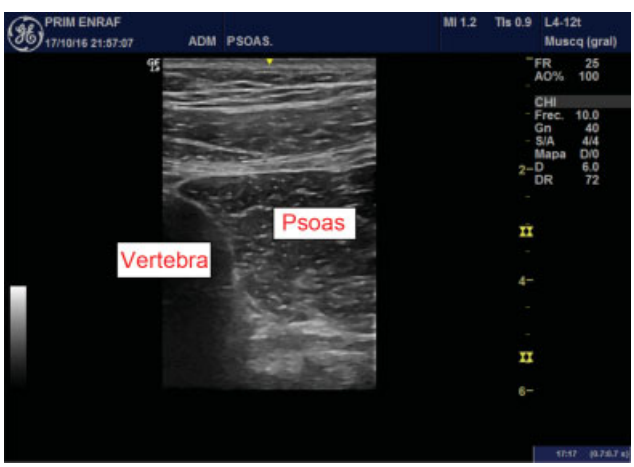

Fig. 3 Sonographic image of the L4 vertebral body and the psoas muscle belly.

relevant muscle in the lumbar area and hips. With a good ultrasound machine, a proper technique and a resonant patient, this assessment may be included within our sonographic examinations of the psoas, with absolute certainty of extracting further useful information.

Conflicts of Interest

The authors have no conflicts of interest to declare.

References

1 Sahrmann SA. Diagnosis and treatment of movement impairment syndromes. St. Louis: Mosby; 2002
2 Neumann DA. Kinesiology of the hip: a focus on muscular actions. J Orthop Sports Phys Ther 2010;40(02):82–94. Doi: 10.2519/jospt.2010.3025
3 Neumann DA, Garceau LR. A proposed novel function of the psoas minor revealed through cadaver dissection. Clin Anat 2015;28(02):243–252. Doi: 10.1002/ca.22467
4 Yoshio M, Murakami G, Sato T, Sato S, Noriyasu S. The function of the psoas major muscle: passive kinetics and morphological studies using donated cadavers. J Orthop Sci 2002;7(02):199–207
5 Levangie PK, Norkin CC. Joint structure and function: A comprehensive analysis (3rd ed.). Philadelphia: F. A. Davis; 2001
6 Muscolino JE. Kinesiology: the skeletal system and muscle function. Elsevier Health Sciences; 2014
7 Mcginnis PM. Biomechanics of sport and exercise (2nd ed.). Champaign: Human Kinetics; 2005
8 Basmajian JV, DeLuca CJ. Muscles alive: Their functions revealed by electromyography (5th ed.). Baltimore: Williams & Wilkins; 1985
9 Blankenbaker DG, Tuite MJ, Keene JS, del Rio AM. Labral injuries due to iliopsoas impingement: can they be diagnosed on MR arthrography? AJR Am J Roentgenol 2012;199(04):894–900
10 Blankenbaker DG, Tuite MJ. The painful hip: new concepts. Skeletal Radiol 2006;35(06):352–370 Review
11 Balius R, Pedret C, Blasi M, et al. Sonographic evaluation of the distal iliopsoas tendon using a new approach. J Ultrasound Med 2014;33(11):2021–2030. Doi: 10.7863/ultra.33.11.2021
12 Lewis CL, Sahrmann SA, Moran DW. Anterior hip joint force increases with hip extension, decreased gluteal force, or decreased iliopsoas force. J Biomech 2007;40(16):3725–3731
13 Levangie PK. The association between static pelvic asymmetry and low back pain. Spine 1999;24(12):1234–1242