



Thickening of the Intramuscular Fascia of the Iliacus Muscle as Evidence of Myofascial Pathology: A New Hip Pain Syndrome

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ABSTRACT

Introduction: Hip/inguinal pain is a common symptom in athletes. Ultrasound (US) examination may discriminate causes, among which the iliopsoas muscle is often neglected. In the present case series study, we describe five patients

with hip/inguinal pain where an accurate US evaluation of the iliopsoas muscle showed that the origin of the pain was due to alterations of the iliopsoas muscle complex, particularly of the fascia surrounding the medial fibers of the iliacus muscle (MFIM). We describe a novel pathological entity characterized by myofascial rigidity and hip/inguinal pain with thickening of the intramuscular fascia of the iliacus muscle and its epimysium, with increased stiffness of the muscle.

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Methods: We studied five athletes with hip/inguinal pain on hip flexion–extension in the absence of hip and visceral pathologies. US was performed with linear probes studying the affected hip at the inguinal level, using longitudinal and axial scans. The examination was completed with power Doppler (PD), strain elastosonography (ELS), and strain ratio (SR) evaluation of the lateral and medial belly of the iliacus muscle.

Results: In all patients, we observed a thickening of the intramuscular fascia that surrounds the medial belly of the iliacus muscle. The mean \pm standard deviation thickness of the intramuscular fascia of the iliacus muscle varied significantly between the affected and non-affected sides (2.70 ± 0.41 mm vs. 1.02 ± 0.15 mm, p value 0.012). In two out of five cases, an increase in the intramuscular perifascial vascular signals at PD was detected. All cases showed stiffness of the MFIM on ELS and altered SR in MFIM compared with the lateral ones in three out of five patients.

Conclusions: We describe a novel cause of a pathological condition of the iliopsoas muscle due to the thickening of the medial belly of the iliacus muscle, easily verifiable with US. All subjects responded to physical therapy with high-energy laser and stretching of the muscle unit. Video available for this article.

Keywords: Iliopsoas; Iliacus muscle; Ultrasound; Ultrasonography; Fascia; Hip pain; Groin pain; Inguinal pain; Myofascial pain syndrome

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Key Summary Points

Ultrasound (US) examination can effectively differentiate between various causes of hip and inguinal pain.

In patients with hip or inguinal pain, a detailed US evaluation of the iliopsoas muscle may reveal that the pain originates from this muscle complex.

A thorough assessment of the fascia surrounding the medial fibers of the iliacus muscle may detect significant thickening, muscle stiffness, and inflammation.

This case series describes a novel pathological entity characterized by the thickening of the intramuscular fascia of the iliacus muscle, contributing to significant hip and inguinal pain.

The thickening of the intramuscular fascia of the iliacus muscle is easily identifiable with US, which can also help rule out other underlying pathologies.

DIGITAL FEATURES

This article is published with digital features, including a video, to facilitate understanding of the article. To view digital features for this article, go to <https://doi.org/10.6084/m9.figshare.30062068>.

INTRODUCTION

Hip/inguinal pain—i.e., pain in the area surrounding the hip joint, including the groin, where the abdomen ends and the lower limb begins, and upper part of the thigh is a common symptom that requires ultrasound (US) examination in the everyday scenario. Among the several causes that are held responsible for hip/inguinal pain, the diseases affecting the iliopsoas muscle are often neglected and underestimated,

particularly in individuals practicing sports, where their incidence is growing [1].

Furthermore, considering the anatomical and functional complexity of the iliopsoas muscle, the spectrum of pathological conditions and clinical symptoms related to it is very wide. The literature describes pathologies of the iliopsoas muscle, tendon injuries, tendon avulsions, tendinopathies, bursitis, hematomas, abscesses and mechanical alterations (such as the snapping hips syndrome) which can cause pain in the lower part of the spine, the pelvis, the groin, hip and thigh and whose diagnosis should be attentively ruled out between numerous other pathological conditions, both skeletal and visceral [2].

In the present case series study, we describe our experience with five patients with hip/inguinal pain where an accurate US evaluation of the iliopsoas muscle, associated with clinical observation, highlighted that the origin of the pain was due to specific and isolated alterations of the iliopsoas muscle complex, and in particular of the fascia surrounding the medial part of iliacus muscle. Based on our findings, we propose a novel pathological entity characterized clinically by myofascial rigidity and inguocrural pain and at US examination by a thickening of the intramuscular fascia of the iliacus muscle and its epimysium, with increased stiffness of the muscle.

METHODS

Normal Myofascial Anatomy

The iliopsoas muscle is a biarticular muscle group, located in the lumboiliac region and in the anterior region of the thigh, and is made up of three distinct parts: the psoas major, the psoas minor and the iliacus muscle. The psoas minor, originating from T12 and L1, is placed ventrally to the psoas major and inserts with a thin tendon on the iliopectineal eminence and on the iliac fascia: it is very thin, functionally not very active and may be absent in 45–60% of the population [3]. The psoas major is long, arises from the vertebral bodies, transverse processes and intervertebral discs from T12 to L4. Its muscle bundles move obliquely downwards

and laterally forwards, forming a single muscular body that joins the iliacus muscle at the level of the inguinal region. The iliacus muscle originates in the pelvis from the iliac fossa, the ventral lip of the iliac crest and the iliolumbar ligament, from the sacral wing and the anterior iliac spines, spreading across the ilium surface like a fan. Iliacus and psoas major muscles pass under the inguinal ligament, separated from the femoral vessels by the iliopectineal ligament. When the two muscles join at the root of the thigh, the fibers of the psoas major lay deep and medial while those of the iliacus pass superficially and laterally, enveloping the psoas major, which mainly contributes to form the tendon that inserts on the lesser trochanter. Below the inguinal fold, the iliopsoas muscle deepens, anteriorly and laterally to the acetabular lip, inserting on the lesser trochanter with apparently a single tendon. Indeed, this latter structure is formed by two distinct tendinous structures: the psoas major tendon, which is more medial and thick, receiving all the fascicles of the iliacus muscle on its lateral margin, and the thinner iliacus tendon, which is located within the belly of the iliacus muscle, lateral to the psoas major tendon (Fig. 1).

In scientific literature, five different muscular components of the distal myojunctional portion of the iliopsoas muscle are described, based on their origin, course, and muscular or tendon entheses near the lesser trochanter [4]. The most medial and internal portion is made up of the psoas muscle with its robust tendon. Two groups of muscle bundles can be distinguished in the belly of the iliacus muscle: the more medial fibers that converge in a tendon that merges with the tendon of the psoas major and the more lateral fibers, without a tendon, which insert directly on the anterior surface of the lesser trochanter. These two portions of the iliacus muscle are separated from each other by a reinforcing plate of the iliacus muscle fascia, called “intramuscular fascia of the iliacus muscle”, which deepens inside the iliacus muscle, joining the epimysium and almost completely covering the medial belly of the iliacus muscle up to its junction with the tendon. Finally, there are the lateral and inferior bundles of the iliacus muscle, not always well distinguishable

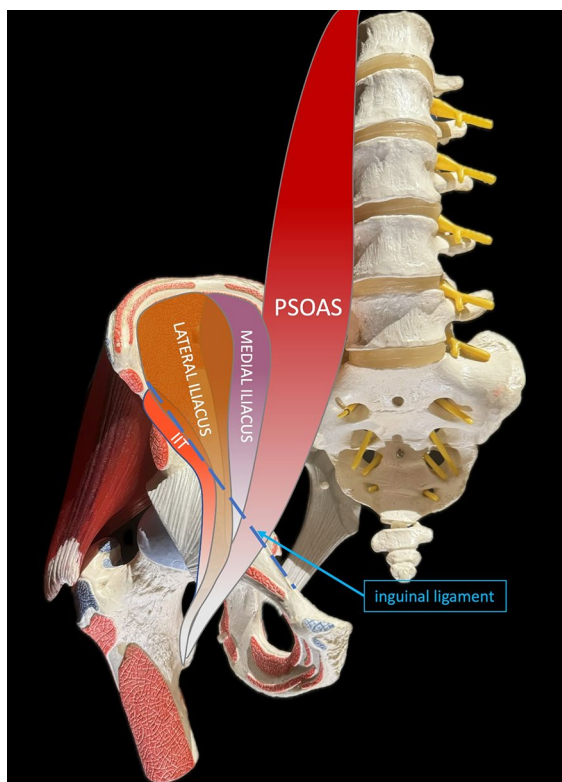


Fig. 1 Frontal view of the muscles of the right hip. *PSOAS* psoas major muscle, *Medial Iliacus* medial fibers of the iliacus muscle, *Lateral iliacus* lateral fibers of the iliacus muscle, *IIT* ilio-infratrochanteric muscle. *Blue dotted line* inguinal ligament

from each other, which in the most lateral portion form a small distinct muscle, the ilio-infratrochanteric muscle, which widens the surface of contact of the muscle with the iliac bone and goes directly to the femur, bordering the coxofemoral joint and inserting into a dimple under the lesser trochanter [3, 5]. Between the capsule of the coxofemoral joint and the deep fascia of the iliopsoas muscle lies the large iliopectineal bursa often communicating with the joint synovium. A smaller insertional bursa is also present between the tendon enthesis and the lesser trochanter [3]. Many anatomical variations and peculiar characteristics of the iliopsoas muscle have been described [3].

The iliopsoas muscle is covered anteriorly by a wide connective band, the iliac fascia. Two thin layers of fat separate this fascia from the peritoneum placed above it in its abdominal section

and from the underlying muscle bundles of the iliopsoas muscle up to its insertion [3]. These characteristics and the course of the iliac fascia demonstrate that the myofascial structures present within the iliacus muscle do not originate directly from the external iliac fascia but from the epimysium of the muscle itself.

The iliopsoas muscle is a powerful hip flexor that stabilizes the trunk and maintains posture. The iliopsoas muscle flexes, adducts, and slightly extra-rotates the hip with pelvis and column as a fixed point. If the fixed point is the femur in an upright position, it flexes the column anteriorly and tilts and rotates the trunk on the same side [3, 6]. Additionally, the iliacus muscle stabilizes the pelvis and allows correct hip flexion during running and the psoas major muscle stabilizes the lumbar spine and the head of the femur in the acetabulum of the hip.

Patients

The patients of the present case series are five adult athletes (one cross-country runner, two runners, one football player, one weightlifter), of which three males and two females with a mean age of 29.6 ± 2.8 (26–33 years old) who came to our attention with symptoms of fatigue of the ileo-psoas muscle, significant inguinal pain on hip flexion–extension. Of the five cases presented, four patients were semi-professional athletes and one patient was an amateur athlete. Furthermore, all patients suffered from chronic and long-lasting pain in the hip and groin (for at least three months). All patients gave written informed consent to the publication of their anonymized clinical data. Patients were evaluated with a brief physical examination focused on the hip, including the main clinical-functional tests, including the evaluation of the range of motion (ROM), Thomas test and the flexion–adduction–internal rotation (FADDIR) test and with a complete US examination of the hip and lower abdomen.

The present study was approved by the Università degli Studi di Genova Comitato Etico per la Ricerca di Ateneo (CERA), Ethics Committee approval n° 2025/51. The study was performed in accordance with the Helsinki Declaration of

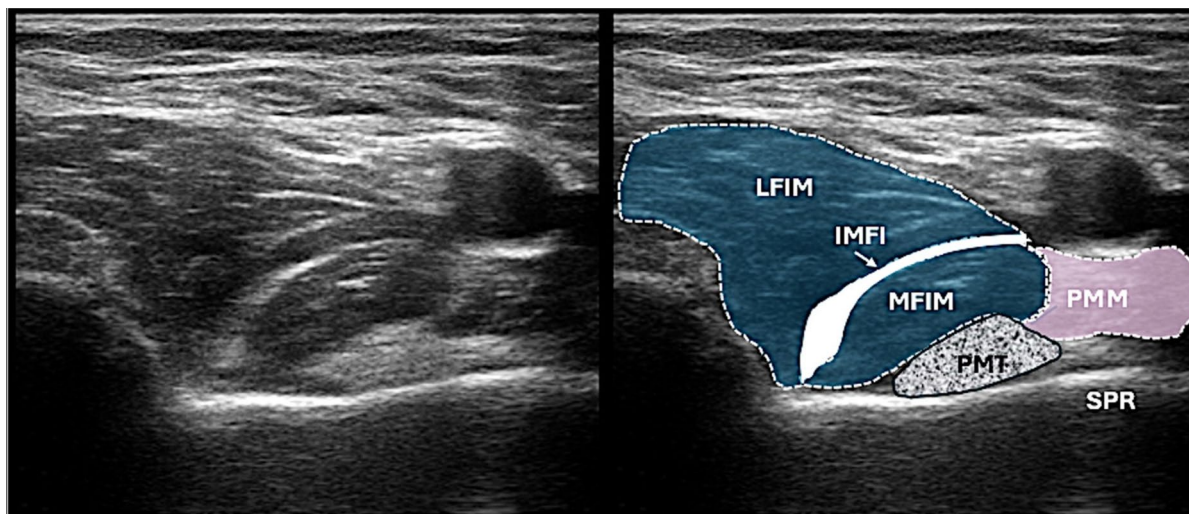


Fig. 2 Panoramic axial oblique view of the right hip, above the level of the anteroinferior iliac spine. *PMM* psoas major muscle, *PMT* psoas major tendon, *IMFI* intramus-

cular fascia of the iliacus muscle, *MFIM* medial fibers of the iliacus muscle, *LFIM* lateral fibers of the iliacus muscle, *SPR* superior pubic ramus

1964 and its later amendments. All participants provided written informed consent for participation in the study and the publication of anonymized imaging data.

Ultrasound Anatomy and Scanning Technique

The US evaluation of the hip was performed with a Samsung US scanners (HS 50, HS 60, and V8) with multifrequency linear probes (2–14 MHz), comparing the painless hip at the inguinal level, using static and dynamic axial and longitudinal scans. The B-mode examination was completed with power Doppler (PD), strain elastosonography (ELS) and strain ratio (SR) evaluation of the lateral and medial belly of the iliacus muscle.

A large part of the iliopsoas muscle–tendon complex can be explored with US, both with a convex and linear probe: at lower frequencies (3–5 MHz) with a convex probe at the abdominal level and at higher frequencies (2–14 MHz) with a linear probe at the inguinal region, where the muscular unit becomes superficial. The US of the extra-abdominal section of the muscle is performed with the patient supine with the limb in a neutral position and in a slightly extra-rotated

position for better visualization of the most distal and insertional portion [7].

In an oblique axial scan, passing above the level of the antero-inferior iliac spine, we can easily recognize:

1. the tendon of the psoas muscle, hyperechoic and with an ovoid shape, which lies above the superior pubic ramus;
2. the psoas muscle, medial to the tendon and below the femoral vascular pedicle;
3. the medial fibers of the iliacus muscle, lateral and above the psoas tendon, are separated from the lateral fibers of the iliacus muscle by a thin band (incomplete in the posterior portion), the so-called ‘intramuscular fascia of the iliacus muscle’ [5] (Fig. 2).

This fascia extends inside the iliacus muscle, joining the epimysium, almost completely covering the medial belly of the iliacus muscle, and is visible as a hyperechoic line that can be followed up to the myotendinous junction. This fascial structure can have variable extension and positions: it may be highly echogenic and well defined with a semicircular shape or, less frequently, not clearly separated from the surrounding tissues, thus appearing less distinct.

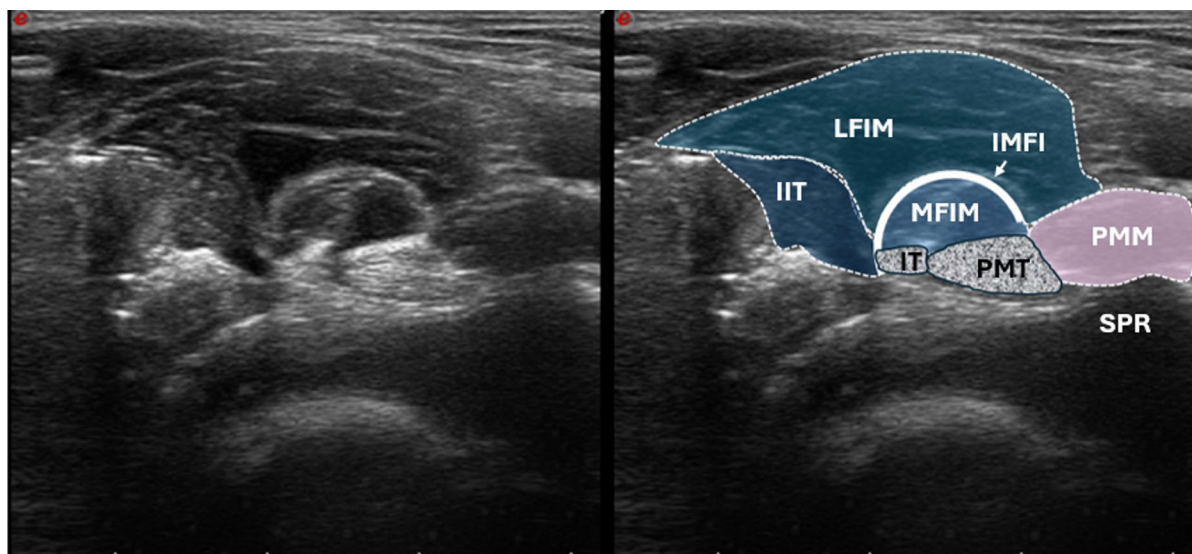


Fig. 3 Panoramic axial view of the right hip below the level of the antero-inferior iliac spine. *PMM* psoas major muscle, *PMT* psoas major muscle tendon, *IT* iliacus muscle tendon, *IMFI* intramuscular fascia of the iliacus muscle,

MFIM medial fibers of the iliacus muscle, *LFIM* lateral fibers of the iliacus muscle, *IIT* ilio-infratrochanteric muscle, *SPR* superior pubic ramus

In an axial scan, below the antero-inferior iliac spine, the following structures can be recognized from medial to lateral:

1. the psoas major tendon with its muscle lying on the acetabular edge;
2. the medial and lateral fascicles of the iliacus muscle are separated by the *intramuscular fascia of the iliacus muscle*, which sometimes at this level can present a thickening of its deepest edge to form a thin tendon structure;
3. laterally, a muscle with a roughly triangular section that represents the infratrochanteric muscle [5](Fig. 3).

In a longitudinal scan, underneath the inguinal ligament and on the coxofemoral joint, the belly of the iliacus muscle that overlies the head of the femur is easy to identify. Inside the muscle, the intramuscular hyperechoic linear structure can be recognized corresponding to the *intramuscular fascia of the iliacus muscle*, which extends up to the distal myotendinous junction and separates the more superficial-lateral fascicles from the deeper medial ones (Fig. 4). With a more medial and oblique

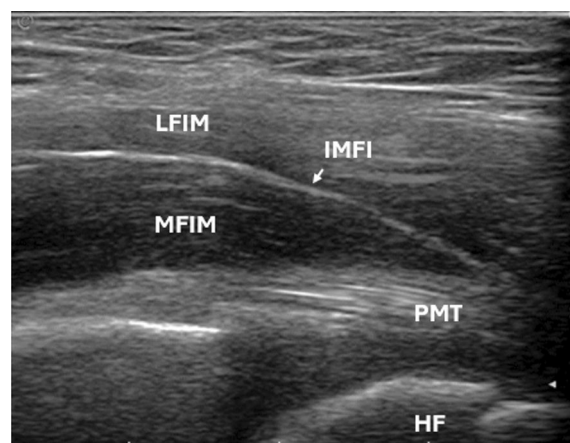


Fig. 4 Longitudinal view of the right hip, above the inguinal ligament. *PMT* psoas major muscle tendon, *IMFI* intramuscular fascia of the iliacus muscle, *MFIM* medial fibers of the iliacus muscle, *LFIM* lateral fibers of the iliacus muscle, *HF* head of the femur

longitudinal scan it is possible to identify, with the limb in slight external rotation (easier in thin subjects), the distal tendon of the muscle that inserts on the lesser trochanter.

Statistical Analysis

Descriptive statistics are reported as means, standard deviations (SD), medians, and interquartile ranges. The Shapiro–Wilk test was carried out to verify the normality of the distributions. *T* test for paired data was used to compare the values. Post hoc power analysis was performed to estimate the sample size, $1 - \beta$ value of the variables was >0.9 , assuring an appropriate sample size. The significance level was set to 5%, the analysis was conducted with R 4.0.3 for Windows and XLSTAT 2020.

RESULTS

In all studied patients we observed, only in symptomatic hips, a marked thickening of the intramuscular fascia that surrounds the medial belly of iliacus muscle, verified with its measurement thickness in axial scans and in comparison with the contralateral one (Fig. 5a, b). Results in detail are shown in Table 1.

The mean \pm SD thickness of the intramuscular fascia of the iliacus muscle between the two sides varied significantly being 2.70 ± 0.41 mm in the affected side vs. 1.02 ± 0.15 in non-affected sides (p value = 0.012; min–max 2.10–3.20 vs. 0.90–1.30); in two out of five cases an increase in intramuscular perifascial vascular signals at PD was detected (Fig. 6). Moreover, in all cases there was a clear stiffness of the medial iliacus muscle on ELS with evidence of a score of 4 or 5 (predominantly or totally hard appearance) of the muscle and a strain ratio >2 between medial fibers of the iliacus muscle (MFIM) and lateral fibers of the iliacus muscle (LFIM) in all patients (Fig. 7a, b) [8]. The Strain Ratio of stiffness showed statistically significant differences with a p value of 0.008 (see Table 1) and a mean of 2.35 ± 0.44 vs. unaffected contralateral 1.282 ± 0.11 .

US examination allowed to rule out the main differential diagnoses in all patients, in particular other pathological conditions or structural lesions of the muscles and tendons of the hip/inguinal region, joint effusions, bursitis and

pathologies of the inguinal canal and pelvis (inguinocrural hernias, ovarian pathologies in women, urinary tract pathologies, appendicitis and direct/indirect signs of inflammatory bowel disease). All patients had also had an X-ray of the pelvis and hip joints before the US, which was negative for bone pathologies.

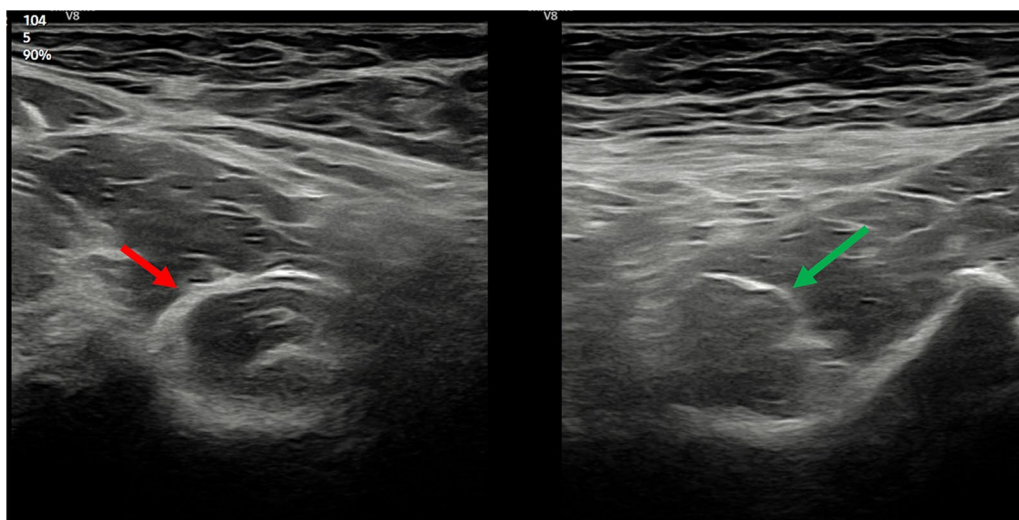
The first patient observed in October 2021 performed, after US (see video 1 in the online/HTML version of the manuscript or follow the digital features link under the abstract), a magnetic resonance imaging (MRI) of the pelvis and hip which contributed to the differential diagnosis and confirmed the localized thickening of the epimysium of the medial iliacus muscle and the consensual suffering of the muscle in the subfascial area as the only possible cause of pain. After the first patient, two other patients completed the US investigation with MRI, which confirmed the US findings. The physical examination excluded other causes of pain because all patients had preserved ROM, negative hip impingement tests, no signs of hyperlaxity and normal laboratory tests (CPK, CRP, ESR, TSH). The Thomas test was used to assess the involvement of the hip flexor muscles in the painful condition complained of by the patient, and everyone actually had a positive test demonstrating a state of contraction of the muscular unit. The FADDIR test was negative in all the patients.

Below is the link to the electronic supplementary material. Video 1. Axial scan of the iliopsoas muscle in the first patient with right inguinal pain showing marked thickening of the fascia surrounding the iliacus muscle (16:9 video) (MP4 3254 KB)

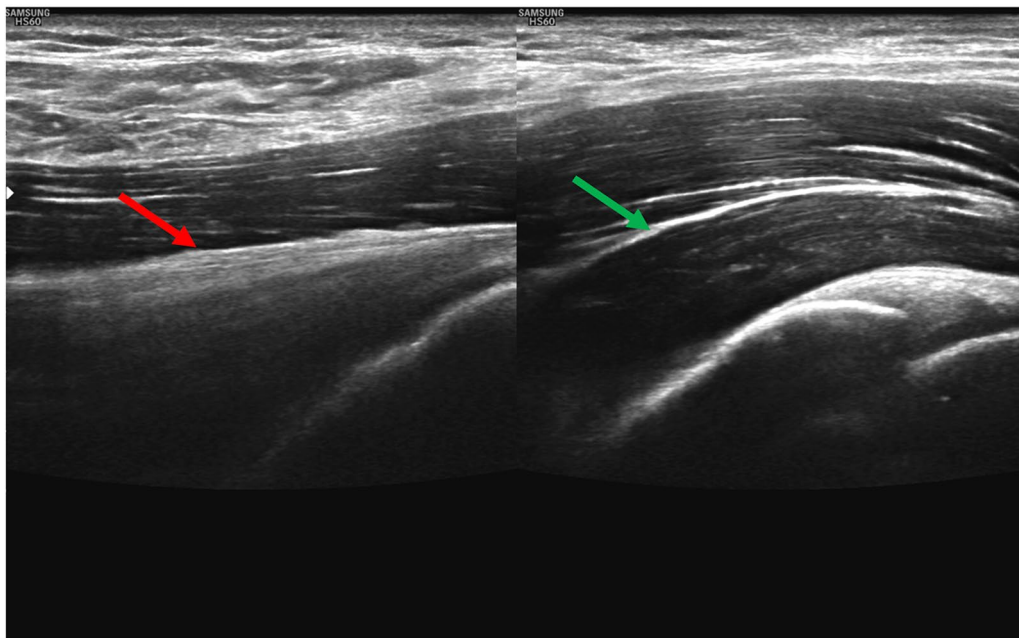
Lastly, all subjects received physical therapy, including high-energy laser treatment and stretching of the muscle unit. With this rehabilitation plan, a slow and gradual improvement of the painful syndrome was observed.

DISCUSSION

These first five cases presented demonstrate, within the vast range of pathologies affecting the hip and inguinal region, that the hip/inguinal



a



b

Fig. 5 a Axial scan on the iliopsoas muscle of a patient with right groin pain. Thickening of the intramuscular fascia of the iliacus muscle (*red arrow*) in comparison with the control (*green arrow*). b Longitudinal scan on the iliopsoas

muscle of a patient with right groin pain. Thickening of the intramuscular fascia of the iliacus muscle (*red arrow*) in comparison with the control (*green arrow*)

pain may result from isolated alterations of the intramuscular fascia of iliacus muscle (IMFI), accompanied by the muscular stiffness of the MFIM. A paramount role in the US diagnosis of IMFI thickening is the accurate observation of

the muscular anatomy of the distal third of the iliopsoas muscle, of its various myotendinous components and the comparison with the contralateral hip. Since specific US parameters relating to the thickness and pathological alterations

Table 1 Results of the ultrasonographic assessment of the intramuscular fascia of the iliacus muscles in the studied cases

	BMI	Maximum pathological fascia thickness (mm)	Maximum contralateral fascia thickness (mm)	PD	ELS	Strain ratio MFIM/LFIM	Strain ratio MFIM/LFIM contralateral
Case 1	19.13	3.2	0.9	No	Stiff	2.82	1.35
Case 2	23.12	2.1	1	Yes	Stiff	1.81	1.31
Case 3	20.54	2.7	1.3	Yes	Stiff	1.98	1.2
Case 4	22.98	2.4	0.9	No	Stiff	2.22	1.11
Case 5	21.92	3.1	1	No	Stiff	2.91	1.44
Mean \pm SD	21.5 \pm 1.7	2.7 \pm 0.41*	1.02 \pm 0.14	na	na	2.35 \pm 0.44	1.3 \pm 0.11 [§]

BMI body mass index, ELS strain elastosonography, LFIM lateral fibers of iliacus muscle, MFIM medial fibers of iliacus muscle, na not applicable, PD power Doppler, SD standard deviation

**p* value 0.012, [§]*p* value 0.008

of this fascial structure are lacking in scientific literature, the comparative US study and the multiparametric approach (power-Doppler ELS strain and strain ratio) are mandatory.

The US B-mode imaging allowed for the exclusion of structural lesions in muscles and tendons, as well as alterations in the echostructure and echogenicity of the iliopsoas muscle bundles, and demonstrated evidence of the thickness of the IMFI. The dynamic scans excluded the possibility of other conditions such as snapping hip syndrome [5]. Strain elastosonography, performed in comparison with the healthy side, demonstrated that the thickening of the IMFI is accompanied by an increase in stiffness of the MFIM and correlates with the clinical evidence of iliopsoas rigidity. The thickening of the IMFI, due to the semi-circumferential course of the fascia like a thick sleeve around the MFIM, a sort of confinement of the muscle bundles, and the stiffness of the myotendinous and myofascial unit without evidence of structural lesions, can justify the pain. These results attest to the anatomical and functional importance of the fascia in the pathophysiology of muscular dysfunctions, as already described for myofascial syndromes [9]. In the four cases in which the power-Doppler showed perifascial and intramuscular vascular signals, we also hypothesized the presence of inflammation in the myofascial

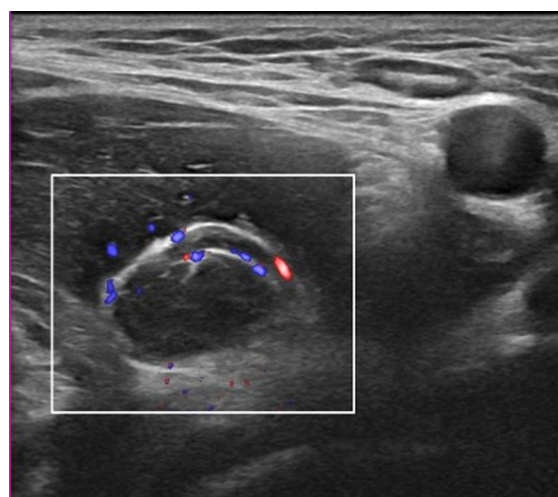
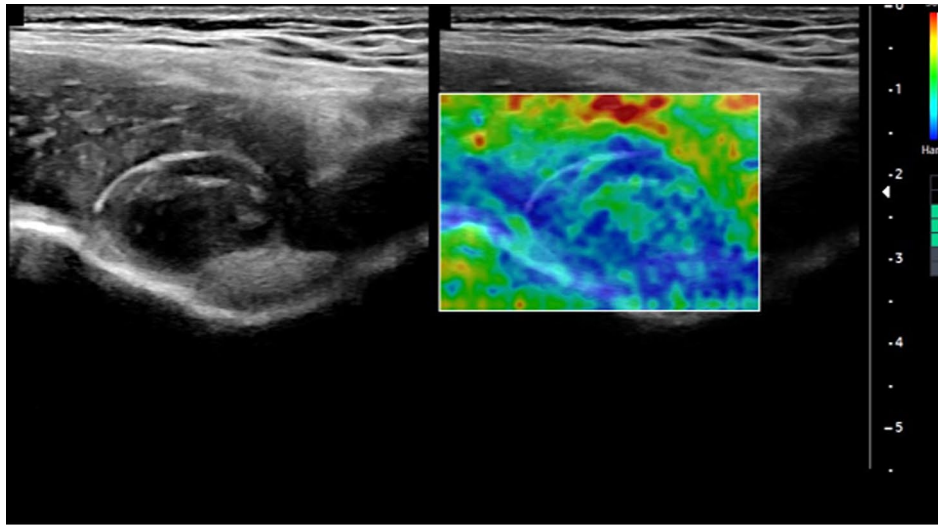


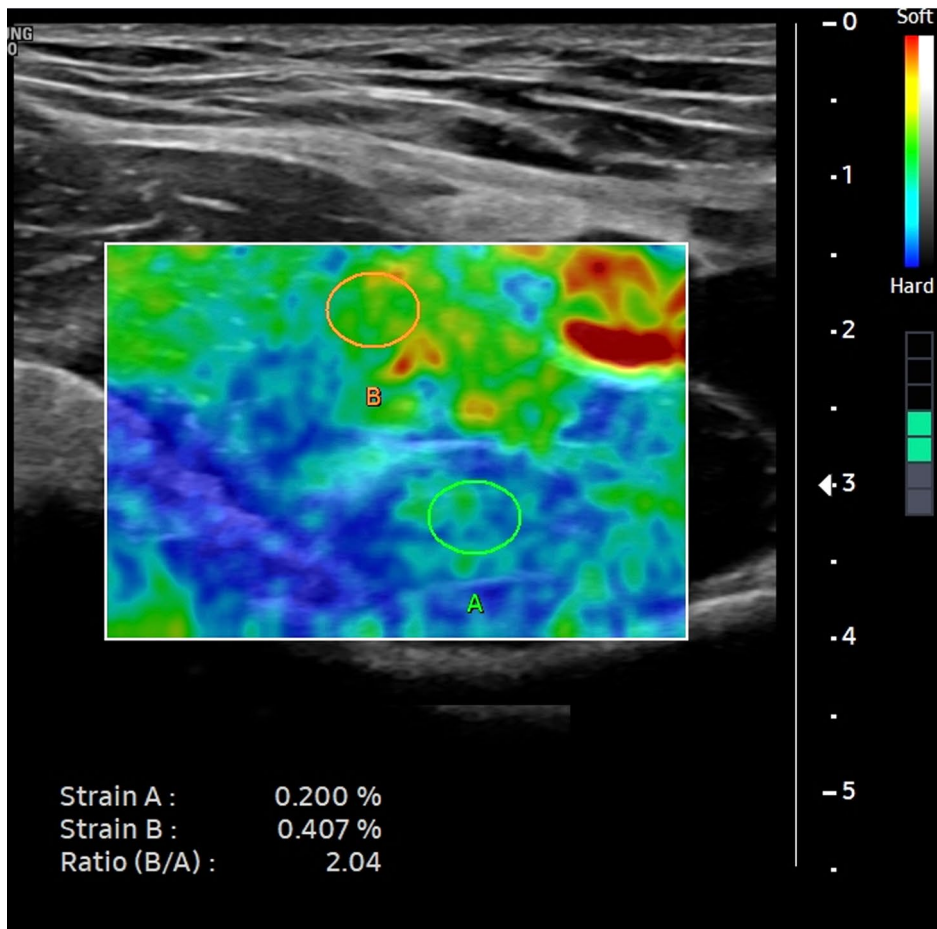
Fig. 6 Axial scan on the iliopsoas muscle of a patient with right groin pain and thickening of the intramuscular fascia of the iliacus muscle. On power Doppler examination, increased intramuscular and perifascial vascular signals are visible

region, likely as a result of muscle overuse and subsequent fatigue.

In the literature, only variants of the course and anomalous movements of this intramuscular band of the iliacus muscle are described that support the snapping hip syndrome [5] but in the present case series the pain reported by all five



a



b

◀**Fig. 7** a Axial scan on the iliopsoas muscle of a patient with right inguinal pain and thickening of the intramuscular fascia of the iliacus muscle. On strain elastosonography, the rigidity of the muscle around the intramuscular fascia of the iliacus muscle and the predominantly stiff pattern of the medial fascicles of the iliacus muscle compared to the lateral fascicles are evident (score 4–5). b Axial scan on the iliopsoas muscle of a patient with right inguinal pain and thickening of the intramuscular fascia of the iliacus muscle. Evaluation of the stiffness of the iliacus muscle with strain elastosonography and evaluation of the strain ratio between the medial and lateral fascicles of the iliacus muscle

patients was inguinal/coxalgia pain also present at rest in the sitting position and more intense during the movements of flexion–extension of the thigh and running. Moreover, almost all patients were athletes and subjected to significant muscular workloads; therefore it was necessary to exclude all causes of hip/inguinal pain typical of athletes. It is known, in fact, that iliopsoas disorders can be a significant source of groin pain in the athletic population and commonly described pathological conditions, including iliopsoas bursitis, tendonitis, impingement and snapping hip syndrome may develop in these subjects [10]. However, as also defined by the Doha agreement, there are many other possible causes of groin pain in athletes [11]. We excluded other causes of pain related to the pathology of the adductors, inguinal canal, pubis, and hip and other rarer causes of musculoskeletal pain. Furthermore, taking into account that at the level of the pelvis the iliopsoas muscle represents the muscular floor of the iliac fossae and lay adjacent to the ileocecal tract and the appendix on the right, the colon on the left, the ovarian appendages, the epigastric vessels and the abdominal wall, in the present case series was necessary to exclude concomitant abdominal and pelvic pathologies via abdominal US scans. In particular, in women, the causes of myofascial pelvic pain, which generally radiates from the pelvis to the upper part of the thighs or the genital region, should always be excluded since it can be confused with pain originating from the iliopsoas [12].

When we observed the unilateral and very marked thickening of the IMF in the first patient coming to our attention, we also requested MRI

of the pelvis and hip that confirmed the US findings and excluded other pathologies. Subsequent MRI studies in the present case series were requested for the other two patients, all confirming the thickening previously detected via US examination, and helped us to rule out other sources of groin pain. However, a preliminary clinical evaluation of the patients and a brief physical examination of the hip were necessary in order to orientate diagnosis. No clinical test is diagnostic per se, but the combined use of multiple diagnostic tests can point towards the involvement of a specific muscle group, as in the case of patients with groin-crural pain. An evaluation of the ROM of the hip and the FADDIR test can exclude pathologies such as osteoarthritis and femoroacetabular impingement [13]. In all five patients, the Thomas test was positive, indicating shortening of the hip flexors with good accuracy, although its reliability is variable and subject to many biases [13]. The US diagnosis of myofascial thickening of the iliacus muscle allowed us to define the origin of the pain and to attribute it to a pathological fascial condition and contracture of the iliacus muscle, also in light of the clinical-anamnestic context. Considering the anamnestic profile of our patients, young and all athletes, the clinical characteristics, and the US findings, we hypothesized that the pathogenesis of this painful condition is due to the overuse of the muscle followed by inflammation of the fascia and therefore a functional disorder of the underlying muscle.

Since all patients were athletes and suffered from chronic and long-lasting pain in the hip and groin (for at least three months), it is very likely that fatigue and overload of the iliopsoas muscle has favored over time the inflammation and thickening of the fascia that runs in the iliacus muscle and that surrounds the medial belly of the iliacus muscle and consequently a thickening of the fascia and an increase in stiffness of the iliacus muscle itself. It should be noted that in the non-fatigued and pain-free contralateral side, US did not detect myofascial alterations of the iliacus muscle.

Of no secondary importance is the evaluation of the structural and postural causes that may have determined this painful condition, as suggested for the so-called functional disorders

of the iliopsoas muscle [14]. In light of these considerations, our patients were treated with conservative therapy, muscle stretching and relaxation exercises of the thigh flexors, also in accordance with the evidence in the literature [10, 15, 16]. In all patients, conservative, physical (high power laser therapy) and rehabilitative therapy aimed at relaxing the iliacus muscle and reduce inflammation in the myofascial region involved, which gradually resolved the pain. Only in one patient was it necessary to combine non-steroidal anti-inflammatory therapy to achieve a significant clinical improvement.

The choice of avoiding the use of shear wave elastosonography, which could have added further quantitative data, is linked to its many limitations already shown in the literature [17, 18]. The major limit of this case series lies in the small cohort of patients involved; therefore larger studies are needed in order to further confirm our findings. Moreover, it will also be useful to understand whether the alterations of the iliacus muscle change over time in response to therapy and how much they affect the pathophysiology of hip/inguinal pain.

CONCLUSIONS

We described a novel cause of hip/inguinal pain and pathology of the iliopsoas due to the thickening of the IMFI, easily verifiable with a simple US examination.

Medical Writing/Editorial Assistance. Nothing to declare.

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Data Availability. The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of Interest. Roberta Gualtierotti is on the advisory boards of Bayer, Biomarin, Roche, Sanofi, SOBI, and Novo Nordisk, and has participated in speaker bureau/educational meetings for Biomarin, Pfizer, SOBI, Takeda, and Novo Nordisk. Roberta Gualtierotti is an Editorial Board member for Pain and Therapy. Roberta Gualtierotti was not involved in the selection of peer reviewers for the manuscript nor any of the subsequent editorial decisions. Salvatore Massimo Stella, Annarita Saponara, Fabio Vita, Marco Becciolini, Mario Miccoli, Galletti Stefano, Cotellessa Filippo, and Trompetto Carlo have nothing to disclose.

Ethics Statement. The present study was approved by the Università degli Studi di Genova Comitato Etico per la Ricerca di Ateneo (CERA), Ethics Committee approval n° 2025/51. The study was performed in accordance with the Helsinki Declaration of 1964 and its later amendments. All participants provided written informed consent to participate in the study and for the publication of anonymous imaging.

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