COMPUTED TOMOGRAPHY OF ILIOPSOAS COMPARTMENT

Thesis

Submitted in Partial Fulfilment for the Master Degree in Radiodiagnosis

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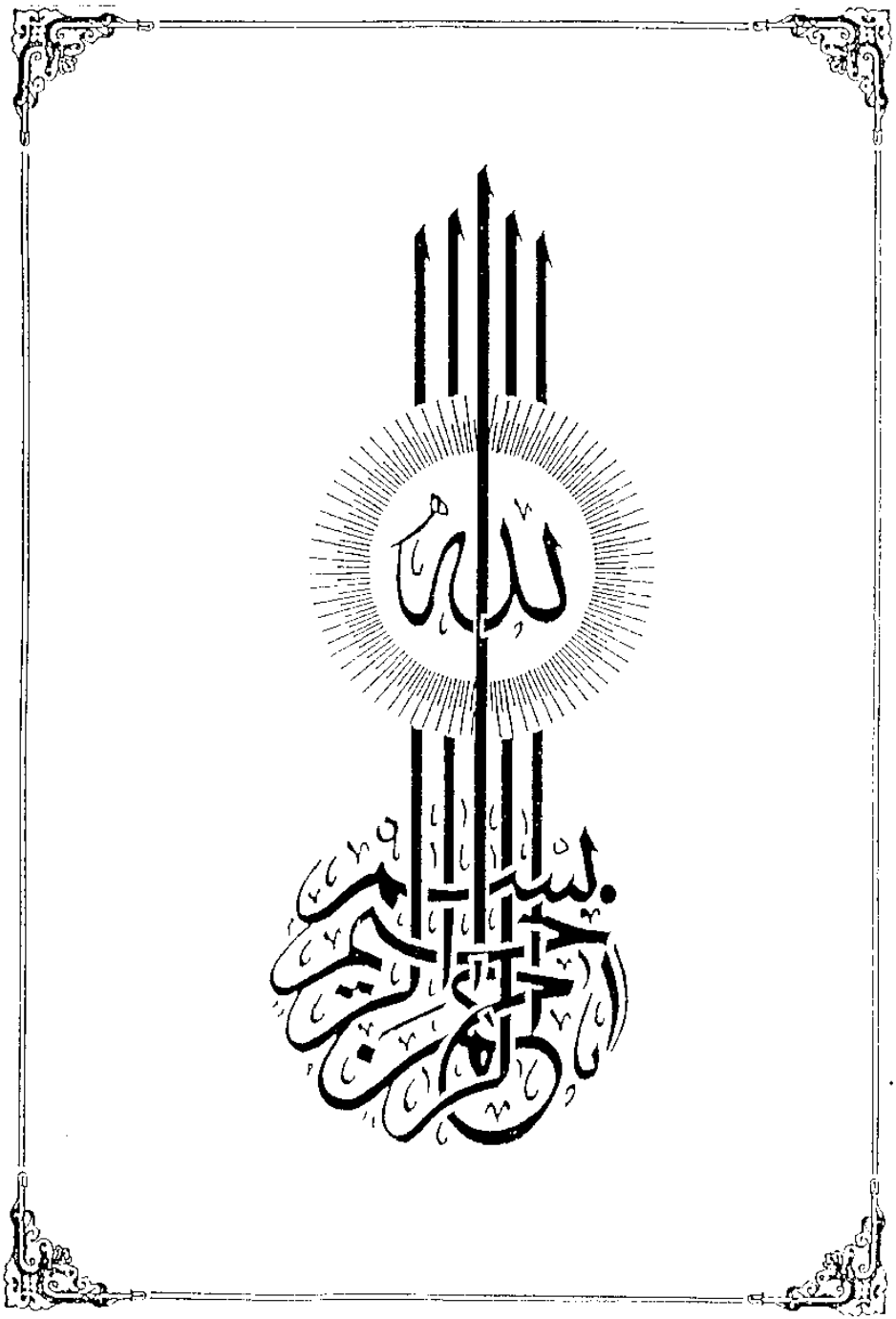

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INTRODUCTION
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The iliopsoas compartment acts as an important pathway for the spread of disease to remote areas. Knowledge of its anatomy facilitates the early diagnosis of same potentially fatal lesions.

The major types of abnormalities involving the iliopsoas compartment include infection, haemorrhage, neoplasm and miscellaneous abnormalities.

Diagnosis of psoas disease was difficult until the advent of computed tomography (C.T.). C.T. provides a non invasive, highly precise evaluation of this area and has led to earlier detection of iliopsoas pathology (Feldberg, 1983; Van Dyke et al., 1987).

The aim of this study is to review the anatomic relationships of iliopsoas compartment and to emphasize the role of C.T. examination in the diagnosis of the numerous lesions that occur in this compartment.

ANATOMY

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Gross Anatomy:

The normal anatomy of the iliopsoas compartment is composed of muscles, fascia and has relationships to the chest, the peritoneum, the axial musculoskeletal system and to the appendicular musculoskeletal system.

I- Muscles:

The three muscles of the iliopsoas compartment are the iliacus, psoas major, and psoas minor (Fig.1).

The iliacus arises from the iliac wing and inserts into the psoas tendon and lesser trochanter of the femur.

The psoas major arises from:

1- The transverse processes of the lumbar vertebrae;

2- The intervertebral discs and adjacent vertebral margins of T_{12} to L_5 and

3- The tendinous arches.

These arches bridge the constricted portions of the vertebral bodies and insert onto the intervertebral discs and the adjacent bony margins.

The psoas major inserts onto the lesser trochanter of the femur via the tendon (Donovan et al., 1981).

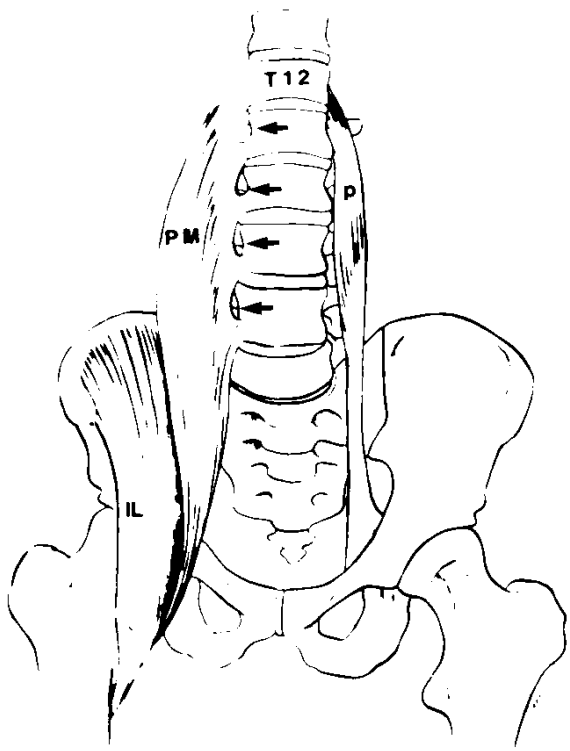

Figure (1):
This diagram illustrates the three muscles of the iliopsoas compartment: the psoas major, PM, psoas minor, P, and the iliacus, IL. Note the location of the tendinous arches (arrows).

After Van Dyke et al., 1987.

As it exits from the pelvis, the psoas major assumes a more anterior location, merging with the iliacus to become the iliopsoas muscle. The iliopsoas passes beneath the inguinal ligament to insert onto the lesser trochanter of the femur (Lee et al., 1989).

The psoas minor: is a long, slender muscle, located immediately anterior to the psoas major.

The psoas minor muscles may be absent in up to 40% to 70% of individuals (Haaga and Alfidi, 1988).

When present, it arises from the sides of the body of the 12^{th} thoracic and 1^{st} lumbar vertebrae and from the fibrocartilage between them.

It ends in the long flat tendon that inserts onto the iliopectineal eminence of the innominate bone, just anterior to the psoas major (Love et al., 1981).

The psoas major, psoas minor, and iliacus muscles compose a group of muscles that function as flexors of the thigh and trunk (Lee et al., 1989).

II- Fascia:

The fascia covering the iliopsoas muscles is continuous with the endoabdominal fascia (transversalis fascia) (Fig.2).

Since the transversalis fascia forms the posterior boundary of the retroperitoneum, the iliopsoas compartment is not a true of retroperitoneum.

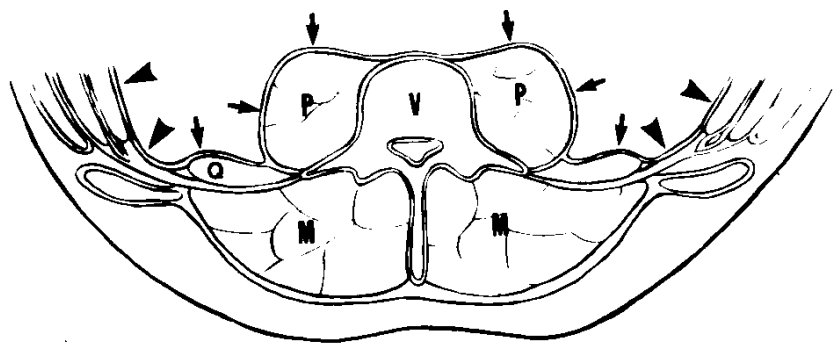

Figure (2):

A transverse section of the mid abdomen shows the fascia (arrows) surrounding the psoas major, P, and quadratus lumborum, Q, which blends with the transversalis fascia (arrowheads), the posterior boundary of the retroperitoneum.

V = Vertebral body.

M = Posterior paraspinal muscles.

After Van Dyke et al., 1987.

However because of its close relationships, it is often included in discussions of the retroperitoneum (Feldberg et al., 1983).

At the superior and inferior borders, the iliopsoas fascia blends with the deep fascial planes of the chest (endothoracic fascia) and lower extremity (fascia lata) respectively (Van Dyke et al., 1987).

The fascia around the psoas muscles form a pyramidal space that potentially connects the mediastinum with lower limb (Van Dyke et al., 1987).

III- Relationship of the iliopsoas compartment to the chest:

The posterior attachments of the diaphragm include the crura and the arcuate ligaments (Fig.3).

The medial arcuate ligament attaches to the body of L_1 or L_2 and the transverse process of L_1, the psoas muscle passes beneath the arcuate ligament of the diaphragm, (Fig.4) at its superior attachment (Lee et al, 1989).

This relationship means that the cranial portion of the psoas major passes into the thoracic cavity, facilitating spread of disease into or out of the thorax via the iliopsoas compartment. The iliopsoas compartment is a potential conduit extending from the chest to the lower extremity (Van Dyke et al., 1987).

The lateral arcuate ligament is an analogus structure behind which the quadratus lumborum passes (Van Dyke et al., 1987).

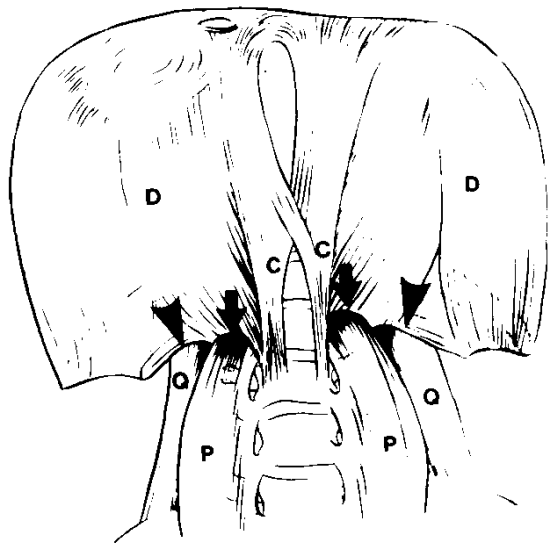

Figure (3):
The cranial aspect of the psoas major, P, passes dorsal to the diaphragm, D, behind the medial arcuate ligament (arrow). The quadratus lumborum, Q, passes beneath the lateral arcuate ligament (arrowhead). C = crura of the diaphragm.

After Van Dyke et al., 1987.

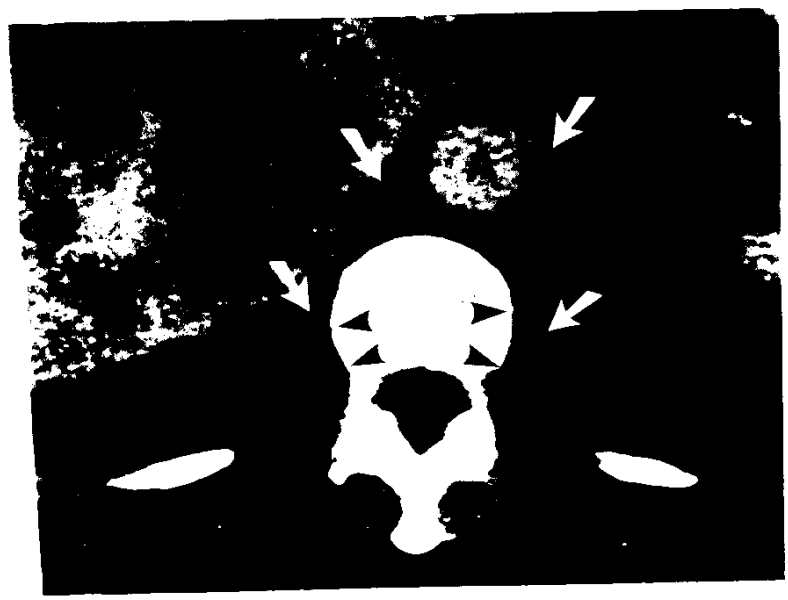

Figure (4):
On this C.T. section, note that the cranial portion of the psoas major (arrowheads) lies dorsal to the diaphragmatic crura (arrows). A thin fat plane separates both of them.

After Van Dyke et al., 1987.

IV- Relationship to the retroperitoneum:

Although the iliopsoas compartment is retrofascial i.e. posterior to the retroperitoneum, the retroperitoneal structures are in close proximity to it. This proximity permits frequent violation of the retroperitoneal fascial planes by infection, haemorrhage, and neoplasm (Hopper et al., 1985 and Weinreb et al., 1985).

Spread of disease in the retroperitoneum is generally predictable. The retroperitoneum is divided into compartments by multiple fascia, and knowledge of their location, points of insertion, and relationship to the retroperitoneal structures is necessary if it's needed to understand the spread of disease. Most of these compartments are not engulfed by fascia on all sides and thus become potential "openings" and routes of communication through which disease may spread.

The psoas muscle is covered on its anterior and lateral borders by a fascia and thus forms a compartment which communicates with the spine, pelvis, and femur. Since the psoas passes beneath the arcuate ligament of the diaphragm superiorly, there is a potential channel from the mediastinum to the thigh (Feldberg, 1983).

The psoas compartment is bordered posteromedially by the quadratus lumborum muscle and spine and laterally by the posterior perirenal fascia (above the renal hilus) (Fig.5a) and the perirenal space and its contents (below the hilus) (Fig.5b). Thus the posterior perirenal fascia often does not extend to the psoas muscle but appears to fuse with the fasciae near the lateral margin of the psoas, or even with those of quadratus lumborum.