
UNILATERAL PSOAS MINOR: A CASE REPORT

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ABSTRACT

INTRODUCTION: The posterior abdominal wall is a complex region of human anatomy. It is formed by the lumbar vertebrae, pelvic girdle and the five main posterior abdominal muscles - the iliacus, psoas major, quadratus lumborum, the diaphragm, their associated fascia and the variable psoas minor and tertius muscles. The psoas muscle group is comprised of the long fusiform muscles – major, minor and tertius, with only the psoas major muscle being an obligatory muscle present in all individuals. The psoas muscle group, however, is extremely variable and the muscles have differences not only in their structure and morphology, but also in their innervation. The psoas minor is an extremely variable inconstant muscle, a prime example for a vestigial structure in the human body.

CASE REPORT: During a standard posterior abdominal wall dissection of an adult female cadaver a unilateral right-sided psoas minor muscle was established, with a complete absence of the same muscle on the contralateral left side. The unilateral right-sided psoas minor muscle was located superficially and laterally to the psoas major muscle; it was fusiform in shape and its body measured 96 mm in length and 16mm in circumference.

CONCLUSION: The psoas muscle group is one of the most variable muscle groups in the human body. It could be bilateral – located on both sides of the vertebral column on the anterior surface of psoas major muscle. Our case is representative of one of the not so common variations of the psoas minor muscle with muscle morphology extremely representative of this type of unilateral variation.

Keywords: *psoas minor, posterior abdominal wall, variations, morphology*

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INTRODUCTION

The posterior abdominal wall is a complex region of anatomy. It is formed by the lumbar vertebrae, pelvic girdle and the posterior abdominal muscles - the iliacus, psoas major, quadratus lumborum, their associated fascia and the variable psoas minor and tertius muscles (1). Topographically a portion of the diaphragm also resides on the posterior abdominal wall, although it does not per se belong to this muscle group.

The psoas muscle group is comprised of long fusiform muscles – major, minor and tertius, with only the psoas major muscle being an obligatory muscle present in all individuals. The muscles from the psoas muscle group, however, have differences not only in their structure and morphology, but also in their innervation (1).

The psoas major is a constant muscle in the human body. It is divided into a deep and superficial part (1,2). The deep part originates from the transverse processes of the lumbar vertebrae (L) - L1 to L5. The superficial part originates from the lateral surfaces of the last thoracic (Th) and the first four L vertebrae - Th12-L4 and their neighboring intervertebral discs. Innervation of the psoas major is through the anterior rami of L1 to L3 nerves (2). Its function is flexion of the hip and lateral flexion of the vertebral column. In extremely rare instances a small bundle of muscle fibers can arise directly from variable places of the psoas major muscle, forming the psoas accessorius muscle, often confused with the psoas minor muscle, although in some instances the accessorius and minor muscles can fuse their bodies or tendons (3,4).

The psoas minor is an inconstant muscle. It originates as vertical fascicles inserted on the bodies of the Th12 and L1 vertebrae (5). It is innervated from the anterior rami of the L1 nerve. This variable muscle is a prime example for a vestigial structure in the human body. Although its actions include bending of the lumbar spine and stabilization of the hip joint, these actions are extremely limited and the absence of the muscle does not reflect on them in any manner. In rare instances the muscle can be present only unilaterally.

The psoas tertius is the least studied muscle of the psoas group as its presence is extremely rare in humans (6). The muscle is extremely variable in its places of origin and there have been several reports of extremely variable morphology, some with a clinical manifestation due to the muscle penetrating and splitting the femoral nerve (6).

The psoas muscle group is not per se an individual group of muscle, as it can also be viewed as part of the ileopsoas muscle, together with the iliacus muscle, due to the joining together of their tendons (1).

CASE REPORT

This study was carried out at the Department of Anatomy and Cell Biology, Medical University – Varna “Prof. Dr. Paraskev Stoyanov”, Varna, Bulgaria.

During a standard posterior abdominal wall dissection of an adult female cadaver a unilateral right-sided psoas minor muscle was established, with a complete absence of the same muscle on the contralateral left side (Fig. 1).



Fig. 1. View of the posterior abdominal wall with a unilateral right-sided psoas minor muscle

The unilateral right-sided psoas minor muscle was located superficially and laterally to the psoas major muscle (Fig. 2). The muscle was fusiform in shape and its body measured 96 mm in length and 16 mm in circumference. The muscle tendon was dilated distally and inserted into the ileopectineal arch.



Fig. 2. View of the unilateral right-sided psoas minor muscle. Note the muscle body has been manually retracted

DISCUSSION

The psoas muscle group is one of the most variable muscle groups in the human body. It could be bilateral – located on both sides of the vertebral column on the anterior surface of psoas major muscle (2). It could be absent on both sides. In rare cases it could be present unilaterally – only on the one side, left or right, of the vertebral column (5).

Another variation of the psoas minor muscle could be due to gender and racial differences. For example, there were many reported cases of prevalence of psoas minor in Japanese population which ranges from 35% to 55% (7). However, other research showed that the prevalence of psoas minor between young black and white men and found that psoas minor was absent in 91% of African-Americans and in only 13% of white, non-Hispanic Americans (4,8). The psoas minor muscle is also more frequently absent in females, regardless of side or race (4,8).

CONCLUSION

Our case is representative of one of the not so common variations of the psoas minor muscle with muscle morphology extremely representative of this type of unilateral variation.

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Conflict of Interest

The authors declare no conflict of interest.

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