

UNUSUAL RECTUS ABDOMINIS AND PYRAMIDALIS MUSCLES: CLINICAL SIGNIFICANCE - A CASE REPORT

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ABSTRACT

During dissection of the anterior abdominal wall variant pyramidalis and rectus muscles were encountered in a 60-year-old male cadaver. The left pyramidalis muscle was enclosed in the right rectus sheath and the right rectus muscle overlay the left. General and plastic surgeons as well as internists should be aware of these variant muscle forms in certain clinical procedures, such as harvesting the rectus abdominis as a free flap and paracentesis.

Key Words: Pyramidalis muscle, Rectus abdominis muscle, Rectus sheath, Variation

INTRODUCTION

The development of the musculoskeletal system is complex and depends on many factors such as: the development of the CNS, embryonic movements, coordinated integration of mesenchymal derivatives and a variety of epithelial and mesenchymal interactions. During this process, muscle differentiation, muscular connective tissue, tendons and aponeuroses develop (1,2). Although muscle variations are quite common (3), the variations reported in this article have not been encountered in the literature.

The anatomy of the rectus abdominis and pyramidalis muscles is well known as well as the fact that pyramidalis muscle is highly variable. In 20 to 25 % of the population the pyramidalis may be absent or double (3).

This report demonstrates variant pyramidalis and rectus abdominis muscles and their clinical significance.

CASE REPORT

An abnormal pattern of the pyramidalis and rectus abdominis muscle was encountered during the anterior abdominal wall dissection of a 60-year-old male cadaver.

A vertical incision from the xiphoid process of the sternum to a point 2.5 cm above the pubic symphysis and a horizontal incision between the lateral side of the thighs, encircling the external genitalia have been performed. The skin flaps were reflected laterally. The superficial fascia was cut along a line between the highest points of the two iliac crests, and separated from the muscles of the abdominal wall. By a longitudinal incision the rectus sheath was opened and reflected to demonstrate the rectus muscles.

After reflecting the anterior layer of the lower part of the rectus sheath, it was found that the left

pyramidalis muscle was situated in the right rectus sheath, inserted in its medial and internal part. The inferior 12 cm of the right rectus muscle overlay the left just before it inserted to the left pubic crest with the left rectus muscle. The inferior part of the linea alba was not apparent due to the pyramidalis muscle which crossed the midline (Fig. 1).

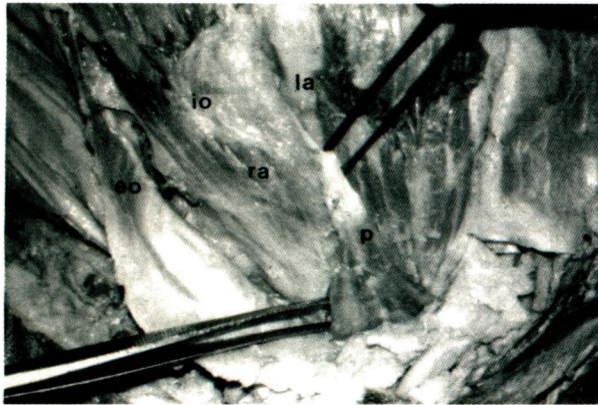


Fig. 1.: Photograph of the variant rectus abdominis and pyramidalis muscles
ra: rectus abdominis
p: pyramidalis
eo: external oblique aponeurosis
io: internal oblique aponeurosis
la: linea alba

DISCUSSION

The numerous and different tasks of the muscles of the anterior abdominal wall and the frequency of the surgical procedures in the region point out the clinical relevance of the variant muscles (3,4).

Clinicians, especially plastic and general surgeons as well as internists, should be familiar with possible regional variations to minimize the risk of complications and apply the best method of treatment when they occur. The presence of the rectus abdominis and pyramidalis muscle crossing the midline can make the procedures complicated.

1. The rectus abdominis flap (superior and inferior) is frequently used by plastic and reconstructive surgeons in different clinical

procedures. Particularly when the inferior free flap is used, there is potential risk for complications (5-10).

2. Most commonly used incisions are the paramedian, pararectus and midline incisions. The length and direction of the surgical incisions are largely governed by the position and direction of the nerves and vessels of the anterior abdominal wall, the direction of the muscles fibres and arrangement of the aponeuroses forming the rectus sheath (4).

3. Paracentesis is a frequently used therapeutic and diagnostic procedure performed in the midline or laterally. Especially the midline incision is accepted as a rapid method of gaining entrance to the abdomen (4).

We conclude that:

1. As a consequence of harvesting the inferior part of the rectus abdominis as a free flap an abdominal hernia/bulge or visceroptosis can occur due to reduction of the abdominal wall strength (4,8,9,11). The inferior part of the rectus abdominis muscle which crossed the midline could provide an additional support to the anterior abdominal wall and decrease/prevent the mentioned complications. Such arrangement of the muscles at the inferior half of the anterior abdominal wall, as described herein, could prevent the separation of the recti generally seen in elderly multiparous women as divarication (4).

2. To achieve the minimum interference with the function of the muscles of the anterior abdominal wall, it is important that the incisions are made in the line of the muscles or aponeurotic fibres (4). Unexpected muscular mass (asymmetric, muscle fibres crossing the midline) could result in injury to the muscle with subsequent damage to the nerves and vessels. Subsequently, when the function of the rectus abdominis muscle is impaired the stability and effectiveness of muscles of the trunk would be reduced (11,12).

3. During paracentesis in the midline the needle should pass just through the skin, fasciae and parietal peritoneum (4). Unexpected bleeding due to injury of the vascular structures within the variant muscle could occur.

Although the variant forms of the anatomical structures are generally related to unexpected events, in certain situations they may have some positive impacts. Regarding the aforesaid clinical implications of the reported variant muscles, and plastic and general surgeons, particularly internists should keep this in mind.

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