A case report of aponeurotic origin of rectus abdominis

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Abstract

Rectus abdominis is a long strap like muscle that extends along the entire length of anterior abdominal wall. Normally the rectus abdominis arises by two tendons. The larger lateral tendon attached to the crest of the pubis, pubic tubercle up to pectineal line. The medial tendon is attached to the pubic symphysis. The fleshy fibers of rectus abdominis replaced by aponeurosis below the umbilicus was found during the routine dissections of a middle aged female cadaver at Dr. Pinnamaneni Siddhartha Medical College, Chinnavutapalli, Andhra Pradesh, India. The knowledge of partial or complete absence of rectus abdominis and other anterior abdominal wall musculature is of immense importance for the General surgeon, Anatomist and the Gastroenterologist.

Key words: anterior abdominal wall musculature, Prune belly syndrome

Introduction

Rectus abdominis is a long strap like muscle that extends along the entire length of anterior abdominal wall. It is widest in the upper abdomen. The muscle fibers are interrupted by three tendinous intersections. Normally the rectus abdominis arises by two tendons. The larger lateral tendon attached to the crest of the pubis, pubic tubercle up to pectineal line. The medial tendon is attached to the pubic symphysis. It is inserted in to 5th, 6th and 7th costal cartilages by three slips. It helps in maintaining the tone of anterior abdominal wall during straining. It is also involved in the flexion of trunk

The trunk muscles are derived from segmental myotomes of the paraxial mesoderm. During the 5th week of intrauterine life, the outward growth of transverse process of blastemal vertebra divides the individual myotomes into smaller dorsal part called epimere and larger ventral part called hypomere. The hypomere extends ventro - laterally along the somatopleuric layer of the coelomic cavity and constitutes the muscles of the body wall which acts as flexors of the trunk. On each side of the mid - ventral line three primitive muscles of the body wall fuse and form longitudinal column of muscles. The longitudinal column is represented in abdomen by rectus abdominis

Agenesis of abdominal muscles as a whole is very rare anomaly. Series malformations of the urogenital and digestive system frequently accompany the condition. According to Hollinshead, Brunot found about 50 cases of agenesis of muscles of anterior abdominal wall

Here, the authors describe a rare case of rectus abdominis replaced by aponeurosis below the level of umbilicus.

Case report

The fleshy fibers of rectus abdominis replaced by aponeurosis below the umbilicus was found during the routine dissections in a middle aged female cadaver at Dr. Pinnamaneni Siddhartha Medical College, Chinnavutapalli, Andhra Pradesh, India. Normally the rectus abdominis arises by two tendons: The larger lateral tendon from the crest of the pubis, pubic tubercle up to pectineal line and the medial tendon from the pubic symphysis. In the present case, rectus abdominis was aponeurotic below the umbilicus. On right side rectus abdominis arose from the aponeurosis one cm. below the umbilicus. On left side the rectus abdominis arose from aponeurosis 1.2 cm below the umbilicus (Fig.1). On both sides aponeurosis was attached to the pubic tubercle, pubic crest and pubic symphysis. On both the
sides tendinous intersections were observed. Bilateral presence of pyramidalis was also observed. Other muscles of anterior abdominal wall were normal in origin and insertion. Uterus was absent. It may be due to hysterectomy. Both kidneys and ureters were normal. Urethra, urinary bladder was normal. Stomach and other gastrointestinal structures were normal. Heart and major blood vessels arising from the heart were normal. Both lungs were normal.

Discussion

Usually only a single muscle is absent on one side of the body, or only part of the muscle fails to develop. Common examples are sternocostal head of the pectoralis major, palmaris longus, trapezius, serratus anterior and quadratus femoris. Complete or partial absence of rectus abdominis is very rare4.

Prune belly syndrome, an uncommon anomaly, consists of genitourinary anomalies and a partial or complete absence of abdominal wall musculature5. In the present case, only partial absence of rectus abdominis below the umbilicus was found. Rest of the anterior abdominal wall muscles were normal. Genitourinary organs were normal except absence of uterus. But absence of uterus may be due to hysterectomy as the cadaver was of more than 50 years of age.

Gerard-Blanluet et al reported two patients with segmental, unilateral wall musculature deficiency associated with homolateral agenesis of ribs6. Ger and Coryllos reported a case of 18 year old male patient with absence of anterior abdominal wall musculature with other components of Prune belly syndrome. They repaired anterior abdominal wall by transposing the thigh muscles for missing musculature5.

Ikiz and Ucerler observed absence of tendinous intersections in rectus abdominis muscle bilaterally. In this case origin and insertion of both rectus abdominis muscles were normal7.

Yang et al have examined 18 fetuses of 5 - 9 weeks of gestation to study the development of rectus abdominis. At 5th week, two plate like mesenchymal condensations were found in the abdominal wall. These two condensations corresponded to the undifferentiated rectus abdominis and lateral abdominal muscles. The abdominal muscles and their associated connective tissue appeared to be differentiated between 6th - 7th weeks. At 7th week supracostal part of the rectus abdominis was consistently seen superficial to the internal intercostal muscle. At 8 - 9 weeks the rectus abdominis increased in thickness and the anterior and posterior sheaths reached the medial margin of the rectus abdominis and completely enclosed it8. Two heads of rectus abdominis may develop after birth9.

According to Ger and Coryllos, the causes of malformation are many and mostly involve an early mesodermal defect whose center appears to lie in the 1st lumbar segment, from which the greater part of transverse and oblique muscles develop with the hypoplasia diminishing cranially and expressing themselves as occasional lower limb defects and a
frequent absence of the upper part of the rectus abdominis. According to Gerard-Blanluet, combination of anomalies of Prune belly syndrome may represent a localized deficiency in the development of somatic mesoderm mesenchyme during early embryogenesis. The partial deficiency of rectus abdominis in the present case may be due to deficiency in the development of somatic mesoderm mesenchyme during early embryogenesis.

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References


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