



Case report

Unilateral absence of external oblique musculo-aponeurotic complex during routine inguinal hernia repair

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ABSTRACT

Introduction: The isolated absence of the external oblique musculo-aponeurotic complex in adults is an extremely rare anomaly. This complex is an important contributor to the strength of the inguinal canal. The present case report describes the unilateral absence of the external oblique muscle in a patient.

Case presentation: A 40-year-old male patient presented with a history of intermittent lower abdominal pain for 5 years which had increased over the past 6 months. Abdominal examination revealed unilateral reducible, incomplete, left sided direct inguinal hernia.

Clinical discussion: Elective unilateral Lichtenstein's mesh hernioplasty was planned for the patient. Intra-operatively, there was no evidence of the external oblique aponeurosis and the spermatic cord was noted deep to the thickened membranous fascial layer. The inguinal ligament was thin and atrophic and was attached to the pubic tubercle medially and anterior superior iliac spine laterally. There was no evidence of any superior aponeurotic connection to the inguinal ligament. A postoperative ultrasound examination of the abdomen confirmed the unilateral absence of the external oblique musculo-aponeurotic complex.

Conclusion: The possibility of such an anomaly should be considered in patients without other risk factors for hernia.

1. Introduction

The external oblique muscle arises from the anterior angles of the 5th to 12th ribs. The superior and inferior slips fuse with the serratus anterior and latissimus dorsi, respectively. The muscle inserts into the anterior half of the iliac crest. Its inferior edge extends from the anterior superior iliac spine to the pubic tubercle and is known as the inguinal ligament. A part that continues posterior (toward the superior pubic ramus) is termed the lacunar ligament. A further extension laterally (along the pecten pubis of the superior pubic ramus) is called the pectineal ligament. Lateral to the pubic tubercle, the aponeurosis of the external oblique muscle divides into medial and lateral crura, which diverges to form the superficial inguinal ring. The nerve supply arises from 7th to 11th thoracic nerves along with the subcostal nerve [1]. Nearly, threefourths of all abdominal wall hernias are inguinal in origin, with a lifetime risk of 27 and 3% in males and females, respectively [2]. The main protection of the inguinal canal is muscular. Contraction of the muscles of the anterior abdominal wall causes a simultaneous shielding,

compressing and squeezing action that protects against the occurrence of an inguinal hernia.

The absence of the external oblique musculo-aponeurotic complex is often associated with the absence of other abdominal wall muscles and associated anomalies [3]. In the present case report, we describe the clinical features and operative findings in a patient who presented initially with lower abdominal pain. The relevant literature and anatomical basis for the unilateral absence of the external oblique muscle that was found in this patient are discussed. The work has been reported in line with the SCARE 2020 criteria [4].

2. Case report

A 40-year-old male, working as a labourer presented with a history of intermittent left lower abdominal pain for 5 years which had increased over the past 6 months. The pain was insidious in onset, gradually progressive, and dragging in nature. The pain increased on prolonged standing and exertion. It was associated with small swellings in the groin

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region. The patient has a history of smoking and constipation. His work involved lifting of heavy objects. There was no history of any surgeries in the past, and he had no other co-morbidities, such as hypertension, diabetes, chronic obstructive pulmonary disease, asthma, or seizure disorders. His birth and development were normal.

On examination, patient was lean built and nourished with a body mass index of 19. The general physical and cardiorespiratory examinations were normal. The thoracic and limb musculature were normal in bulk, tone, and power. Abdominal examination didn't reveal any laxity of the anterior abdominal wall. There was left reducible, incomplete, inguinal hernia. Testicular examination did not reveal any abnormality. The routine lab investigations were normal, and the patient was posted for elective left Lichtenstein's mesh hernioplasty. The patient was prepared, and the surgery was initiated as per standard protocols.

The skin incision was made and deepened through the superficial fatty and deep membranous fascial layers. Membranous layer was thicker than normal. There was no evidence of the external oblique aponeurosis, and the spermatic cord was noted deep to the membranous fascial layer (Fig. 1). The hernial sac was posterior to the cord structures and protruded out of the inguinal triangle. The inguinal ligament was thin and atrophic and was attached to the pubic tubercle medially and anterior superior iliac spine laterally. There was no evidence of any superior aponeurotic connection to the inguinal ligament. There were no variations of the conjoint tendon, rectus sheath, spermatic cord, or inferior epigastric vessels. The contents were reduced into the peritoneal cavity followed by tension-free mesh repair with (15 * 7.5) polypropylene mesh. The mesh was secured to the pubic tubercle medially, inguinal ligament inferiorly, and conjoint tendon superiorly using a polypropylene suture. As the external oblique was absent, the mesh was covered by a thickened membranous fascial layer, following which the skin incision was closed. A postoperative ultrasound examination of the abdomen confirmed the absence of the external oblique musculoaponeurotic complex (Fig. 2) and normal anatomy on the right (Fig. 3). The postoperative period was uneventful. Follow-up was done after a month and 3 months and did not show any evidence of recurrence.

3. Discussion

The isolated absence of the external oblique musculoaponeurotic complex in adults is an exceedingly rare anomaly [5]. The commonly encountered variations of the muscle include variations in the number of attachments to the ribs and absence of one or more of its digitations.

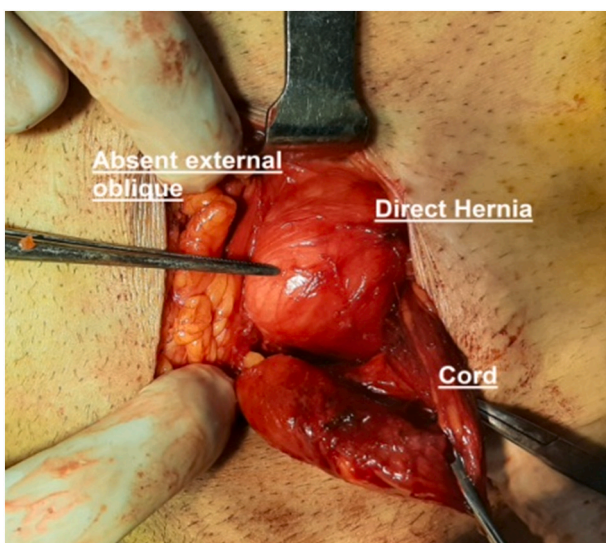


Fig. 1. Intraoperative pic.

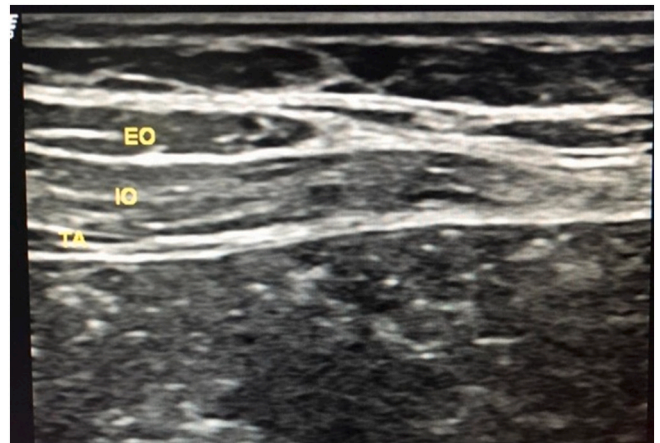


Fig. 2. Normal sonography on rt side.

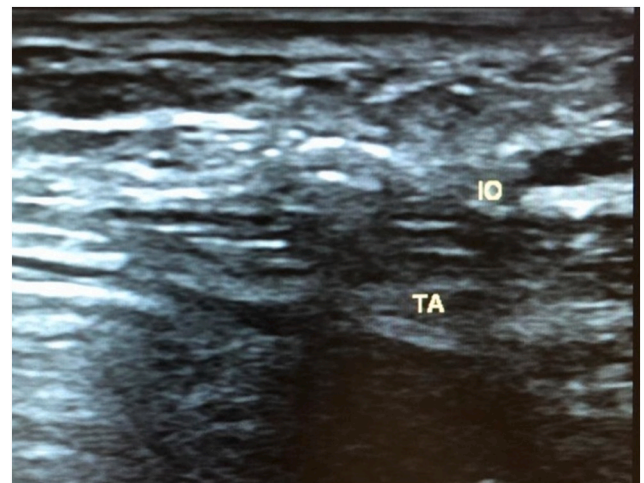


Fig. 3. Absent ext. oblique on left side.

There may also be doubling of one or more of its slips most frequently from the eighth or ninth ribs or an additional slip from the lumbar fascia below the ninth rib. The muscle may be connected to the pectoralis major superiorly. In addition, there may be tendinous intersections or direct attachment with the serratus anterior, serratus posterior superior, or latissimus dorsi. Detached slips may be seen beneath the upper digitation of the muscle [6]. The saphenous muscle is a rare entity, where a digitation of the external oblique is attached at both ends of the inguinal ligament and loops around the saphenous vein [7,8]. In children, various cases of congenital abdominal wall defects have been reported which are ultimately fatal if there is no intervention. The common anomalies are gastroschisis, omphalocele, prune-belly syndrome, bladder extrophy, and Poland syndrome [3].

To the best of our knowledge, there have been only two case reports on the absence of the external oblique encountered during inguinal hernioplasty [5,9]. One patient was an obese male who presented with bilateral inguinal hernia along with an incisional hernia through the postoperative scar of an appendectomy performed earlier. Intraoperatively, it was noted that there was complete absence of the external oblique aponeurosis along with the transversus abdominis and the transversalis fascia [5]. No mention was made about the presence of the inguinal ligament. In another case of bilateral absence of external oblique musculoaponeurotic complex, there was no abnormality of the transversus abdominis or the transversalis fascia, and a weak, thin inguinal ligament was observed bilaterally [9]. Our case was similar to this one, except that the problem was unilateral. The implications of this

abnormality are twofold. First, the vertical compression action that helps to prevent inguinal hernia occurs between the arched portion of the internal oblique muscle and the inguinal ligament [10]. Second, an open mesh repair, tension-free hernioplasty requires the placement of sutures along the inguinal ligament to anchor the mesh [11].

The embryological basis of many of the body wall defects, such as gastroschisis, omphalocele, prune-belly syndrome, and Poland anomaly, has been elucidated [12]. In the present case, it can be postulated that the precursor cells forming the external oblique muscle from the ventrolateral aspects of the somite were not formed or did not migrate appropriately. The external oblique muscle develops from abaxial precursors which are contributed by both the cells of the somite as well as the somatic layer of the lateral plate mesoderm. The formation of these precursors occurs by MyoD expression in the ventrolateral part of the somite. This expression is regulated by activating WNT protein and inhibitory BMP4 protein secreted by the overlying ectoderm and lateral plate mesoderm, respectively [12]. In the present case, the absence of the external oblique aponeurosis was an incidental operative finding without any other associated anomalies. There have been only one prior reports of this anomaly, to the best of our knowledge. This condition may not be diagnosed during childhood and early adulthood unless associated with other anomalies. The clinical suspicion of the same should be present in young and middle aged patients presenting with bilateral or unilateral direct inguinal hernias without other risk factors. In such a patient, a pre-peritoneal repair, such as the TAPP or TEP, should be considered to avoid the mesh lying immediately deep to the scar with the risk of infection. It is to be noted that if a laparoscopic approach for repair was used in this patient, the variation would have gone unnoticed.

4. Conclusion

1. The possibility of such an anomaly (absence of external oblique aponeurosis) should be considered in patients without other risk factors for hernia.
2. In such a patient, a pre-peritoneal repair, such as the TAPP or TEP, should be considered to avoid the mesh lying immediately deep to the scar with the risk of infection.
3. If laparoscopic approach for repair was used in this patient, the variation would have gone unnoticed.

Consent

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Jan M Rather. – surgeon/writing the paper
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Fazal Q Parray – surgeon/writing the paper
Muiez Basher – radiologist/writing the paper.

Declaration of competing interest

Nil.

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