Case Report

Linea arcuate hernia disguised as Pfannenstiel incision’s hernia: a case report and a systemic literature review

Veronica Vincelli*, Cesare Marazzi, Alberto Posabella, and Aurore Steiger

Département de Chirurgie, Hôpital du Jura, Delémont, Switzerland

*Correspondence address. Département de Chirurgie, Hôpital du Jura, Faubourg des Capucins 30, 2800 Delémont, Switzerland. Tel: +41-032-4212676; Fax: +41-032-4212411; E-mail: veronica.vincelli@h-ju.ch

Abstract

We report a rare case of a 46-year-old woman 2 weeks after a cesarean section with Pfannenstiel incision, who presented at the Emergency Department with a significant abdominal pain accompanied by two episodes of vomiting. After that a clinical examination and an abdominal computed tomography scan were completed, a visceral herniation through Pfannenstiel incision was suspected. The indication of surgical exploration was clear. Finally, the laparotomy revealed a linea arcuata hernia with a hernia of the small intestine. After a reduction of the hernia sac, the defect was repaired and no mesh was placed. An antibiotic treatment with co-amoxicillin for 1 week during the recovery was prescribed. The patient recovered uneventfully and could be discharged by postoperative day 7.

INTRODUCTION

An abdominal wall hernia is an abnormal protrusion of a peritoneal-lined sac through the musculo-aponeurotic covering of the abdomen and different types of hernias can be classified in dependence of herniation’s region. To understand the pathophysiology of abdominal’s hernias, the knowledge of the anatomy of the abdominal wall is essential.

The rectus sheath is composed of the aponeuroses of the transversus abdominis, the external- and internal-oblique muscles, and completed by the transversalis fascia, that contains the rectus abdominis muscle. The sheath is constituted of anterior and posterior layers: the anterior layer is composed by the external-oblique aponeurosis, the anterior lamina of the internal-oblique aponeurosis and in the inferior quarter also from the transversus abdominis aponeurosis. The posterior layer is made up of the posterior lamina of the internal-oblique aponeurosis, the transversus abdominis aponeurosis and the transversalis fascia in the three superior quarters and only of the transversalis fascia in the inferior quarter: between these two regions there is a line with an inferior concavity, called the linea arcuata (LA). An ascending protrusion of intraperitoneal structures over the LA is denominated linea arcuata hernia (LAH).

In this region, because of the deficiency of the aponeurotic fibers, the abdominal wall is made up only of the transversalis fascia: this zone of weakness is the major factor that could develop a parietal herniation. Additionally with this anatomic weakness, any condition increasing the intra-abdominal pressure, plays a pivotal role in the development of abdominal hernias (i.e. constipation, obesity, chronic obstructive pulmonary disease, pregnancy).

The prevalence of LAH is unclear, the underlying reason is that most of LAH are asymptomatic and remain unclassified,
the diagnosis is often incidental or could be misclassified by another abdominal hernia [1].

A limited number of studies in the literature describe a symptomatic hernia of LA; no studies reporting the risk factors associated with LAH or clear descriptions of techniques for repair, and overall there are no cases of LAH in post-cesarean period described in the literature.

We aimed to report the case of a patient with an LA strangled hernia without necrosis, 2 weeks post-cesarean section through Pfannenstiel incision.

**CASE REPORT**

We report a case of a 46-year-old adipose woman, presented to the Emergency Department (ED) with a significant abdominal pain accompanied by two episodes of vomiting. Two weeks previously the patient had had a twin birth: the first born was vaginally and the second one by cesarean section with Pfannenstiel incision; the postoperative recovery after the delivery was uneventful.

The clinical examination at the ED demonstrated a mildly distended abdomen in the lower quadrants with regular bowel movements. The patient was afebrile and she had an episode of vomiting in the ED. A gynecologic examination was done that did not show any alteration. The laboratory tests made revealed no pathologic values. Clinically, an incisional hernia through the Pfannenstiel was suspected, for exclude it an abdominal computed tomography (CT) scan has been completed. This examination showed a hernia of the small intestine through the transversalis fascia and the rectus sheath, without radiological signs of strangulations. A visceral hernial defect at the level of the Pfannenstiel incision was suspected. The indication of surgical exploration was clear.

The open laparotomy was done through the Pfannenstiel incision: the exploration did not show any hernia’s defect in this zone; a major revision of the preperitoneal space revealed an herniation up to the Pfannenstiel incision at the lower limit of the posterior layer of the rectus sheath, and a midline laparotomy was necessary. After an accurate revision, an hernia under the Linea arcuate was diagnosed. The hernial sac was opened and the intestinal loops inside were reduced into the abdomen without resection. A direct suture repair of the hernial defect in the abdominal fascia was performed. No mesh was placed.

The patient recovered uneventfully with antibiotic therapy in the initial postoperative period. She has been aliments with a good tolerance and the postoperative pain has been successfully managed by a classic painkiller. The patient could be discharged by postoperative day 7. A follow-up 2 weeks postoperative at her obstetrician-gynecologist showed a fully recovered patient, free of complaints and a healed wound with minimum scarring.

**DISCUSSION**

We report the case of a 46-year-old patient who consulted the ED, 2 weeks after a twin birth because an abdominal pain in the lower quadrants accompanied by vomiting episodes. After completing an abdominal CT scan, there was a suspicion of a herniation through the Pfannenstiel incision. Intra-operative an LAH was diagnosed.

The LAH is rare, just seven cases of LAH are reported in the literature, as described by Montgomery et al. in their review in 2012 [1].

In fact, the prevalence of LAH in the literature was reported only by Coulier with his retrospective study of 315 abdominal CT scan of unselected symptom-free patients: the LAH’s prevalence was 8.57%, though reached 14.97% in men, and a relative male:female sex ratio of 12.5:1 [2]. According to Coulier, the main gender seems to be a risk factor associated to LAH.

As for the prevalence, the literature has not invested studying the risk factors of LAH.

Except the male gender, just the known factors that increased intra-abdominal pressure (i.e. constipation, obesity, chronic obstructive pulmonary disease, pregnancy), which plays a pivotal role in the development of generally all abdominal hernias types, are considered.

Despite the well-known risk factor for the development of the hernias of the abdominal wall is pregnancy, no diagnosis of LAH after a vaginal delivery or cesarean section, conform our case, is reported in the literature.

We speculate that the low interest of the literature for the LAH is due to her low prevalence, probably caused by the fact that the LAH is often not diagnosed, because asymptomatic.

As well as the factor that LAH remains unrecognized because it has no clinical impact in the majority of cases; therefore, no investigation is sought. We find similar evidence in Coulier’s analysis: in his retrospective study of 315 abdominal CT scan of unselected symptom-free patients: in 27 of them the abdominal CT demonstrated fortuitously the LAH [2].

Moreover, even when an LAH is symptomatic, her diagnosis is difficult and the reason why because her symptomatology is a specific and to localize the hernia using only the clinical examination is quite difficult.

An important role that increases the diagnostic accuracy could be the utilization of the radiologic examinations: abdominal US and especially abdominal CT scan.

In fact three of the seven cases reported in the literature were correctly diagnosed by CT. Consistent is Coulier’s study, where he provides compelling evidence that the CT scan helps distinguish the diagnosis of LAH in a significate number of patients, especially in old men [2].

Although imaging is contributively, it remains complex and challenging to diagnose LAH: indeed also with the help of radiologic examinations, the LAH is misdiagnosed as the others abdominal wall’s pathologies, especially as a Spigelian hernia.

Van Meyenfeldt et al. reported two cases of LAH: the first case was a 53-year-old man with a left-sided paramedian bulge of the abdominal wall, which was incorrectly interpreted as a Spigelian hernia during an ultrasound (US) examination. The diagnosis has been corrected in an LAH during laparoscopy. The second case was a 41-year-old man with a left-sided paramedian abdominal bulge at the level of the umbilicus. Since the US examination appeared to be inconclusive, a CT scan was executed and misdiagnosed an LAH as a Spigelian hernia. The diagnosis of a left LAH has been corrected only during laparoscopy [3].

Also in our case, the CT scan induced the misdiagnosis of an incisional hernia of the Pfannenstiel scar, and the correct diagnosis was only identified in the operating room.

The LAH is an underestimated pathology and difficult to diagnose; although contributively and highly recommended, the radiologist could not enable meaningful conclusions by means of the CT scan as in our case. This highlights the possibility of a missed LAH by imaging and shows the importance of at least considering
an LAH in the differential diagnosis of the acute abdominal pain, especially with risk factors, like pregnancy or puerperium.

REFERENCES
1. Montgomery A, Petersson U, Austrums E. The arcuate line hernia: operative treatment and a review of the literature. Hernia 2012;17:391–6.
2. Coulier B. Multidetector computed tomography features of linea arcuata (arcuate-line of Douglas) and linea arcuata hernias. Surg Radiol Anat 2007;29:397–403.
3. Von Meyenfeldt EM, van Keulen EM, Eerenberg JP, Hendriks ER. The linea arcuata hernia: a report of two cases. Hernia 2010;15:229–31.