Robotic Transabdominal Preperitoneal Repair of Bilateral Arcuate Line Hernias

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Abstract

Arcuate line hernias (ALH) are uncommon defects with poorly understood etiology and only a few published reports in regard of diagnosis and repair. Prevalence is unknown because it is frequently misdiagnosed, rarely symptomatic, and, therefore, even more rarely surgically intervened. The authors present a case of a 51-year-old woman who presented to the emergency department with chronic diffuse abdominal pain, nausea, and anorexia. CT (computed tomography) scan of the abdomen and pelvis revealed bilateral ALH. The patient underwent a robotic transabdominal preperitoneal (rTAPP) repair. To our knowledge, this report is the first to describe a successful robotic approach for bilateral ALH repair using the TAPP technique.

Arcuate line hernias (ALH) are uncommon and poorly understood with only a few published reports documenting diagnosis and subsequent repair. The arcuate line, also known as linea semicircularis of Douglas, is defined as the inferior margin of the posterior rectus sheath, approximately at the level of the anterior superior iliac spine, which splits from the aponeurosis of the internal oblique to envelop the rectus muscles.

ALHs result from disruption of the posterior sheath from the overlying rectus abdominis muscles, allowing for herniation of visceral content, such as small bowel. It is generally categorized as an internal or intraparietal hernia, as there is

Figure 1
ROBOTIC TAPP REPAIR OF ALH

no true abdominal wall defect. The cause of such disruption is largely unknown, but an association with previous abdominal wall surgery can be identified in several cases.

Actual prevalence of this type of hernia is unknown as it is frequently misdiagnosed, usually as a Spigelian hernia, and rarely symptomatic. Patients found to have ALHs most commonly complain of abdominal pain that may be diffuse or lateralized, depending on the side the hernia is located on, or they complain of a palpable bulge.

Open and laparoscopic repairs have been described in the literature, where different methods have been used, including intraperitoneal onlay mesh, transabdominal preperitoneal (TAPP), and even primary repairs without mesh. This report describes the first robotic TAPP (rTAPP) repair with mesh.

Case Description

A 51-year-old woman presented to the emergency department complaining of chronic abdominal pain, nausea, and inability to tolerate oral intake; she had a surgical history of an abdominoplasty in the remote past. Abdominal CT (computed tomography) scan revealed small bowel loops extending in-between the posterior rectus sheath and rectus muscles of the abdominal wall bilaterally (Fig. 1). Final diagnosis was consistent with bilateral ALH.

This patient underwent an rTAPP repair requiring 3 ports in the lateral abdomen bilaterally. Bilateral ALHs were easily identifiable upon intraperitoneal access (Fig. 2). A TAPP approach was initiated by incising the peritoneum at the midline with subsequent dissection of the peritoneum off the posterior sheath on the side contralateral to initial port configuration. Reduction of the hernia sac was performed; in addition, a large preperitoneal plane was created to accommodate mesh to adequately overlap the defect in all directions.

The ALH was primarily closed by re-approximation of the posterior sheath to the overlying rectus muscle and anterior sheath with barbed suture (Fig. 3). A 15 cm x 15 cm flat polypropylene mesh was placed and secured in a preperitoneal position with tack fixation (Fig. 4). Mirror image trocars were placed on the contralateral abdomen, the robot was re-docked, and repair of the right ALH was executed in a similar fashion. The mesh was re-peritonealized by re-approximation of the peritoneal flap to the abdominal wall.

The postoperative course was uneventful and the patient was discharged home on postoperative
day 1. Subsequent follow-up visits over 1 year have revealed no further issues or recurrences.

Discussion
Few cases of ALHs have been reported in the literature, but bilateral arcuate line hernias are even rarer. In the present case, the previous abdominoplasty is suspected to be the most likely contributing factor to hernia development. Given the paucity of documented cases, there is currently no accepted standard for repair.

Both open and laparoscopic techniques have been described previously.1-3,5 Most reports of laparoscopic repair note primary closure of the hernia defect using transfascial sutures or tacks with some repairs describing mesh reinforcement in an intraperitoneal position.1,6 Even fewer reports have mentioned a true laparoscopic TAPP technique with primary closure of the defect to protect intra-abdominal contents from the mesh.2 To our knowledge, this case is the first reported robotic repair of this type of hernia using the rTAPP technique.

Use of the robot is becoming increasingly popular in general surgery and is proving to be an accepted tool in the armamentarium of a general surgeon. The authors contend that the potential benefits of mesh placed in a preperitoneal position include decreased fixation requirement that contributes to postoperative pain, decreased costs with use of an uncoated mesh, and mesh protected by autologous tissue from the visceral content.

Conclusion
ALHs have been sporadically reported in the literature, with bilateral ALHs representing an even rarer finding. No accepted standard repair exists, with cases of both open and laparoscopic repairs reported in the literature. The current case demonstrates that the robotic approach is a safe alternative for the repair of complex hernias such as bilateral ALHs.

References