Planned reduction of incarcerated groin hernias with hernia sac laparoscopy

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Abstract

Background: Laparoscopic techniques have been described as adjuncts in the management of acutely incarcerated groin hernias, with the intention of reducing operative morbidity and patients discomfort. However, the use of laparoscopy in acute incarcerations, as well as its appropriateness, remains to be elucidated. Herein we discuss the use of hernia sac laparoscopy in the algorithm of managing incarcerated groin hernias.

Methods: Five patients presenting with small bowel obstruction secondary to incarcerated groin hernias underwent surgical reduction of the hernia followed by hernia sac laparoscopy. The purpose of hernia sac laparoscopy was to determine the viability of the incarcerated bowel segment based on color, peristalsis, and venous congestion. When bowel resection was required, a separate incision was made after repair of the hernia.

Results: Bowel viability was assessed accurately with this method. Although hemorrhagic fluid in the hernia sac was noted in three patients, only one patient required a limited exploration through a separate incision for nonviable bowel. Postoperative recovery was standard, with no morbidity or mortality. Patients were discharged in 2–5 days.

Conclusions: Hernia sac laparoscopy, without additional trocar placements, is a safe adjunct for determining the viability of the incarcerated bowel segment. This method reduces the need for laparotomy so long as the reduced incarcerated segment meets the criteria for viability. Videoscopic inspection potentially offers additional information, such as the existence of ascites and peritoneal tumors.

Key words: Small bowel obstruction — Hernia sac laparoscopy — Groin hernia — Incarcerated hernia — Pediatric hernia — Laparoscopic-assisted bowel resection

As facility with advanced laparoscopic procedures improves, alternatives become available in the management of surgical diseases that can potentially lower morbidity and patient discomfort. This report describes five cases of incarcerated groin hernias that were intentionally reduced in the operating room, followed by a planned laparoscopic inspection of the peritoneum through the hernia sac.

Patients and methods

Five patients between the ages of 32 and 86 years were admitted through our emergency room with a diagnosis of small bowel obstruction secondary to incarcerated groin hernias: three were inguinal and two were femoral. Work-up of the patients included routine hematologic and chemistry studies, as well as plain chest and abdominal films. All patients presented with nausea and vomiting associated with a painful groin mass. Fluid resuscitation commenced in the emergency room, and all patients had a nasogastric suction tube placed in anticipation of general anesthesia.

In the operating room, the incarcerated hernia site was explored via an anterior groin incision. All patients had compromised small bowel, and three patients had hemorrhagic fluid within the hernia sac. The neck of the hernia sac was enlarged by incising the fascia, and the contents were reduced. Simultaneously, the operating room staff assembled the laparoscopic instruments in the room. After a delay of 5–10 min, which was ample time for bowel viability to manifest itself, a 10-mm laparoscope was placed in the hernia sac through a Hassan trocar secured by purse-string sutures. Peritoneal insufflation to a pressure of 12–15 mmHg was achieved using carbon dioxide (CO2). A 0° scope was used in all cases. The incarcerated segment of bowel was readily identified in all patients. Bowel viability was assessed using the usual clinical criteria of color, peristalsis, and venous congestion. A polypropylene plug was used in all the repairs.

Results

Using this algorithm, a small bowel segment in one patient with right inguinal hernia was determined to have poor viability. In this patient, an endoscopic Babcock was introduced through a separate trocar placed in the right lower quadrant to isolate the nonvi-
able portion. Leaving the Babcock in place, the laparoscope was removed and the hernia was repaired. Once the groin incision was closed, the right lower quadrant trocar site was extended 5 cm transversely, and the peritoneum was entered with a muscle-splitting approach. The small bowel segment previously isolated with the Babcock was delivered out of the wound and resected.

Overall, there were no perioperative complications. Diets were advanced after 12-24 h. Patients were discharged in 2-5 days. The patient undergoing bowel resection had a patient-controlled analgesia device for 36 h. The other patients had adequate pain control with a combination of oral and intramuscular analgesics (Table 1).

Discussion

This report describes the use of delayed laparoscopic inspection through a groin hernia sac once the hernia has been intentionally reduced. In the management of inguinal and femoral hernias, laparoscopy is being employed in several ways to aid the surgeon. In adults, laparoscopy has been used to retrieve bowel that spontaneously reduced during the repair of an incarcerated inguinal hernia [2]. In that case, the bowel retracted back into the abdomen before the surgeons were able to evaluate it for viability. The laparoscope was introduced into the open femoral sac, and a second abdominal trocar was introduced for grasping the segment of bowel and bringing it back into the abdomen before the surgeons were able to evaluate it for viability. The laparoscope was introduced into the open femoral sac, and a second abdominal trocar was introduced for grasping the segment of bowel and bringing it out through the hernia sac.

Laparoscopic reduction of an incarcerated femoral hernia using multiple abdominal trocars, followed by open preperitoneal mesh and plug repair of the defect, has also been described [5]. In this particular case, a nonviable segment of small bowel was resected through a separate abdominal incision.

A prospective study using exploratory laparoscopy in 27 patients with irreducible inguinal masses has been reported [3]. In that study, 24 patients with inguinal hernias were reduced laparoscopically; in five patients, laparotomy was necessary to resect nonviable bowel. In three patients, the groin masses were attributed to nonsurgical causes. It was the premise of the authors that early laparoscopy for irreducible inguinal masses would obviate unnecessary laparotomies.

The introduction of the laparoscope through the open hernia sac is now utilized in pediatric surgery, primarily for assessing the contralateral inguinal ring for a patent processus vaginalis [1, 4, 6]. This method has helped to reduce the need for contralateral inguinal explorations in the pediatric hernia population, without any additional burdens in terms of operating room time or cost.

In the present series, we used laparoscopy through the open hernia sac solely as a tool for visualization, and not for surgical management. If bowel resection is warranted, the hernia can first be repaired with or without a mesh. The incarcerated portion of the small bowel was accurately identified in all cases. For better visualization, the anesthesiologist assisted by altering the position of the operating table. If uncertainties remained after initial laparoscopic inspection of the bowel, the examination was repeated after a period of delay. Although an angled laparoscope can be used, we found that the 0° laparoscope afforded accurate visualization in these patients. Although it is possible to obtain other information (e.g., peritoneal tumors, ascites, ovarian pathology) through the use of hernia sac laparoscopy, we did not encounter any additional abnormalities in these five patients. When following this approach, the surgeon should always remain cognizant of the presence of sliding hernias that are not fully reducible during surgery.

In our experience, the accuracy and safety of hernia sac laparoscopy for determining bowel viability appeared to equal that achieved by direct inspection with laparotomy. Furthermore, it can reduce the number of laparotomies performed to ascertain bowel viability. Indeed, only one bowel resection was required for nonviability, even though hemorrhagic fluid was noted in the hernia sacs of three patients. This method is certainly not recommended as a replacement of what is standard practice within a community, but rather should be used to expand on the present algorithm in the management of incarcerated groin hernias.

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References


Table 1. Hernia sac laparoscopy after intentional reduction of incarcerated hernia

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Age/Sex</th>
<th>Hernia type</th>
<th>Laparoscopy wait time (min)</th>
<th>Procedure</th>
<th>Peros intake (day)</th>
<th>Discharge (day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>82 F</td>
<td>Right femoral (hemorrhagic)</td>
<td>10</td>
<td>Plug</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>32 F</td>
<td>Right inguinal (hemorrhagic)</td>
<td>6</td>
<td>Plug + mesh</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
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<td>69 M</td>
<td>Right inguinal</td>
<td>7</td>
<td>Plug + mesh</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>86 M</td>
<td>Right inguinal (hemorrhagic)</td>
<td>6</td>
<td>Plug + mesh</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>79 F</td>
<td>Right femoral</td>
<td>5</td>
<td>Plug</td>
<td>1</td>
<td>2</td>
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