Bladder Injury by Trocar during Laparoscopic Appendectomy

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김법우
Background

- Acute appendicitis: laparoscopic appendectomy

- Complicated appendicitis: laparoscopic approach
  - popular procedure

- Laparoscopic complication
  - Subcutaneous emphysema
  - Positioning and nerve injuries
  - Injuries due to insertion of needles and trocars
  - Injuries from electrosurgical equipment
  - Port site bleeding and herniation
Trocar and Veress needle injuries during laparoscopy

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Received: 25 January 2000/Accepted in final form: 27 June 2000/Online publication: 12 December 2000

• 2001년 SALT (Swiss Association for Laparoscopic and Thoracoscopic Surgery)
• 14,243 patients, 1995 and 1997
• Various standard laparoscopic procedure
• Investigated with special regard to intraabdominal complications caused by trocars and Veress needles
22 trocar and 4 needle injuries
incidence: 0.18, (26/14243)

19 case: visceral organ
- 6 case: small bowel
- 3 case: large bowel
- 3 case: liver
- 2 case: greater omentum
- 2 case: bladder

7 case vessel injury
- 3 case: Vessel of the Greater omentum
- 2 case: Vessel of the Mesentery
- 1 case: Vessel of the Falciform ligament
- 1 case: Rt iliac artery
At umbilical and suprapubic sites, is related to an increased risk of perforating lesion
## Complication management

<table>
<thead>
<tr>
<th></th>
<th>Trocar injuries ($n = 22$)</th>
<th>Needle injuries ($n = 4$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment of intraoperatively recognized injuries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laparoscopic repair</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Open repair</td>
<td>15</td>
<td>2</td>
</tr>
<tr>
<td>No surgical treatment</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Treatment of postoperatively recognized injuries</strong></td>
<td></td>
<td></td>
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<tr>
<td>Open repair</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>No surgical treatment</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td><strong>Conversion rate (%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All injuries</td>
<td>68.2</td>
<td>50</td>
</tr>
<tr>
<td>Intraoperatively recognized injuries</td>
<td>78.9</td>
<td>50</td>
</tr>
<tr>
<td><strong>Postoperative complications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wound infection</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>Bile leakage</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>Leakage of the small bowel, peritonitis</td>
<td>4</td>
<td>—</td>
</tr>
<tr>
<td>Obstructive ileus</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>—</td>
<td>1</td>
</tr>
<tr>
<td>Multiorgan failure</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td><strong>Reoperations</strong></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>Mortality</strong></td>
<td>1</td>
<td>0</td>
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<tr>
<td><strong>Hospital stay (days)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>Range</td>
<td>8–93</td>
<td>5–40</td>
</tr>
</tbody>
</table>
Case presentation

- F / 9
- C.C: lower abdominal pain for 2 days
- 1.5 cm sized acute appendicitis in U/S
- Laparoscopic appendectomy
OP finding: Severely inflammed appendix,
Much amount of pus like fluid.
Ovary and other organ was normal
Post Operative Clinical Course

- V/S: stable, no fever
- Mild gross hematuria: foley catheter 의한 bladder mucosa irritation으로 생각하고 observation 함
- Sanguinous gross hematuria on POD #1

Emergency Primary Repair of Bladder

- Previous suprapubic trocar site extension
- Bladder penetration 확인
- Primary repair with Vicryl 3-0
POD # 2 : no hematuria

POD # 6 : foley removal

POD # 7 : discharge
Case presentation

• F / 9

• C.C : lower abdominal pain for 2 days

• 5 cm sized appendiceal abscess on CT scan

• Laparoscopic appendectomy with drainage
Operative findings

- Much amount of pus and reactive fluid was found in the peritoneal and pelvic cavity.
- There was perforation on the tip of appendix.
- It was adhesed to abdominal peritunium and omentum. Measuring 5cm in length and 4cm in diameter.
Post Operative Clinical Course

- Hemovac via suprapubic port site: serous fluid like urine drainage
- R/O bladder injury
- Foley cath. Insertion 한 후 Cystogram 을 시행함
- Radiologic study (Cystogram)
2nd Operative findings

- Primary repair of bladder
  Irrigation and drainage

  : 3cm transverse incision above previous suprapubic op scar
  Found bladder was penetrated by hemovac drain
  Drain removal and primary repair of bladder was done
  Warm saline irrigation was done d/t radioopaque dye
Post operative progress

- POD # 5: Foley removal
- POD # 6: discharge
소아 환자에서 복강경을 통한 충수돌기 절제술 시행시 골반위 포트 삽입위치 선정시에 성인보다 체구가 작기 때문에 세심한 주의가 필요할 것으로 생각된다.
반드시 배꼽과 골반 문합부위를 촉진으로 확인하고 복강경 시야 하에서 방광과의 위치 관계를 고려하여 포트 삽입을 시행하는 주의가 필요하다.