Laparoscopic Cholecystectomy for Traumatic Gallbladder Avulsion: A Case Report and Review of the Literature

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Traumatic gallbladder avulsion following blunt abdominal injury is rare. In patients with stable hemodynamic status, the diagnosis is usually delayed. Diagnostic laparoscopy offers the chance to diagnose the condition in a timely fashion and reduce the possibility of complications. We report a patient presenting with blunt abdominal injury and liver laceration. Laparoscopic examination revealed gallbladder avulsion and cystic artery disruption. Laparoscopic cholecystectomy was performed without incident. The use of laparoscopy in patients with blunt abdominal injury is feasible and offers the opportunity to diagnose early intra-abdominal visceral injuries that mandate surgical intervention.

Key words: traumatic gallbladder avulsion, laparoscopic cholecystectomy, blunt abdominal injury, laparoscopic exploration

Introduction

Traumatic cholecystectomy following blunt abdominal trauma was first reported in 1975\(^1\) and only a few cases have been reported since then. McNabney et al. reported 2 patients with gallbladder trauma after blunt abdominal injury over a 14-year period at a university hospital. Gallbladder trauma has always been associated with significant multi-organ injuries that require early surgical intervention\(^{1-4}\). Soderstrom et al. reviewed 1,449 patients with blunt abdominal injuries and found gallbladder avulsion of different degrees in ten patients\(^4\). All the patients with gallbladder avulsion were diagnosed during laparotomy. Indeed, in hemodynamically stable patients with gallbladder avulsion, the presentation is usually insidious and hard to differentiate from abdominal pain caused by hemoperitoneum\(^5-7\). The diagnosis is thus usually delayed until sepsis has developed\(^8\). Few image findings help to achieve early diagnosis in gallbladder avulsion. The use of laparoscopy in patients with blunt abdominal injury was reappraised in the early 1990s\(^9,10\) but initial application was limited by lack of appropriate instrumentation and video system equipment. The role of laparoscopy has typically been diagnostic. As experience in advanced laparoscopic surgery and improvement of surgical instrumentation has accumulated, a diagnostic and therapeutic laparoscopic approach has become feasible in patients with blunt abdominal injury.

Case Report

A 49-year-old man was sent to our hospital six hours after a motor vehicle accident. Blunt abdominal injury with internal bleeding was noted on admission. Initial vital signs were blood pressure 136/82 mmHg and heart rate 75 beats/
minute. Abdominal computed tomography (CT) scan revealed Grade IV liver laceration, mainly in S4, S5 and S6. Initial blood tests revealed GOT/GPT 515/332 IU/L, amylase/lipase 115/281 IU/L and bilirubin (T/D) 0.9/0.23 mg/dL. Despite relatively stable hemodynamic status, diagnostic laparoscopy was suggested because a thickened gallbladder wall (Fig. 1) was identified by CT scan and for progressive abdominal distension. The procedure included periumbilical minilaparotomy and CO₂ pneumoperitoneum. A four port technique for routine laparoscopic cholecystectomy was utilized. Hemoperitoneum was found as well as liver capsule rupture. The gallbladder was avulsed from the liver bed almost completely except for a small piece of liver capsule holding the lateral aspect of the gallbladder (Fig. 2). Calot’s triangle, including the cystic artery, was also torn and the gallbladder showed early gangrenous change. The cystic duct was intact. No hematoma or bile stain was found in the hepatoduodenal ligament. The duodenum and pancreatic head were free of injury. Laparoscopic cholecystectomy was performed without incident. Bleeders in the liver bed and below the falciform ligament were controlled by electrocautery. The cystic duct was divided between metallic clips. Oozing from the lacerated liver surface was controlled by electrocautery. Further laparoscopic exploration of the retroperitoneum and gastrointestinal tract did not show any other injury. Two Jackson-Pratt drains were placed in the right subhepatic space and pelvic cavity, respectively, for observation. The patient resumed oral intake two days after surgery and was discharged home uneventfully seven days after surgery.

**Discussion**

The most common reported gallbladder injury after blunt abdominal trauma is perforation⁴. Gallbladder avulsion is rare and is usually found during laparotomy for other associated injuries⁴. 

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**Fig. 1** Diagnostic computed tomography scan revealing gallbladder wall thickening with hematoma in the gallbladder fossa.
Cholecystectomy is suggested as the treatment of choice. Gallbladder trauma itself is rarely the direct cause of mortality\(^5\), although surgery is typically delayed in hemodynamically stable patients\(^4\). Sharma reported 22 patients with blunt gallbladder injuries during a 19-year period. Half of the patients were found to have partial or complete gallbladder avulsion. Associated intra-abdominal injury was found in all patients\(^5\). The severity of peritonitis is hard to determine in the presence of hemoperitoneum. Thus the diagnosis is usually delayed. The nonsurgical approach is also stressful for attending physicians when abdominal pain deteriorates, indicating a worsening underlying condition. Frequent clinical evaluation and imaging follow-up, such as sonography or CT scan, are necessary for further differential diagnosis. Diagnostic laparoscopy offers the opportunity to find unexpected injuries and direct further patient care.

The initial application of modern laparoscopic techniques in the evaluation of trauma patients was limited by lack of appropriate instruments and video system equipment; it was primarily used to avoid unnecessary laparotomy in patients with abdominal stabbing injury\(^9,10\). Salvino et al. advocated diagnostic laparoscopy under local anesthesia in the emergency department. However, thorough laparoscopic exploration is difficult due to compromised space and subsequent intervention, such as repair of bowel perforation or cholecystectomy, is not feasible\(^9\). With advances in laparoscopic experience and improved instrumentation, more trauma surgeons have applied the laparoscopic approach to patients with stabbing and blunt abdominal injury\(^7,11-14\). Contini et al. reported their attempt at laparoscopic cholecystectomy in a patient with liver laceration and gallbladder avulsion. It was feasible but the procedure was finally converted to open laparotomy due to severe bleeding from the lacerated liver\(^12\). McKinley et al. reported a successful laparoscopic cholecystectomy in a pediatric patient with gallbladder perforation after blunt abdominal injury\(^11\).

The image findings of gallbladder injury are usually inclusive, although a few case reports of CT findings have been published\(^15\). In the present
patient, a thickened gallbladder wall, associated with extensive liver laceration near the gallbladder fossa, was the only clue to raise suspicion of gallbladder injury.

Thus, our initial experience suggests that early evaluation of patients with blunt abdominal injury by laparoscopy is a feasible approach to guide patient care, avoid unnecessary diagnostic delay and help to avoid complications. In patients with extensive liver laceration near the gallbladder fossa, a thickened gallbladder wall implies possible gallbladder injury and is a clue for early surgical intervention.

References

以腹腔鏡膽囊切除治療創傷性膽囊撕裂：
病例報告及文獻回顧

陳國鋅 林恆甫 吳建明 曾立銘
陳信安 黃實宏

創傷性膽囊撕裂在臨床上相當罕見。術前診斷不易，在血循穩定的病人常常造成延誤治療。診斷性腹腔鏡的運用提供早期治療的契機。我們報告一位因腹部挫傷內出血入院的49歲男性，電腦斷層掃瞄發現肝臟裂傷及膽囊壁增厚。在診斷性腹腔鏡之後成功用腹腔鏡完成膽囊切除。診斷性腹腔鏡使用在腹
部挫傷而血循穩定的病患，可以幫忙早期診斷並明確引導後續的治療。

關鍵詞：創傷性膽囊撕裂，腹部挫傷，腹腔鏡膽囊切除