CASE REPORT

Pitfall in Diagnostic Trauma Laparoscopy

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Summary

The resurging interest in diagnostic laparoscopy has witnessed its increasing application in trauma surgery. Such unbridled enthusiasm has at times overlooked its shortcoming in the diagnosis and management of certain intra abdominal injuries. We report and discuss one such conspicuous limitation and advocate that the use of laparoscopy in abdominal trauma should be tempered with caution

Key Words: Diagnostic laparoscopy, Trauma, Retroperitoneum

Introduction

The last decade has witnessed the pervasive application of laparoscopy in elective as well as emergency surgery. Various studies [1-3] have explored its function in blunt and penetrating abdominal trauma. Two conclusions can be surmised when diagnostic laparascopy is used to aid decision making in equivocal abdominal trauma. Firstly, it appeared able to determine the presence of significant injury and the need for laparotomy[1]. This is vital in view of negative laparotomy rates that can range from 5-60% depending upon the clinical situation. Secondly, the evaluation of peritoneal breach from a penetrating injury seemed to be accurate[3]. Laparoscopy in trauma, however, lacks the ability to accurately diagnose organ-specific injuries[2]. A region of particular complexity is the retroperitoneum, where injuries may be missed even with the more established modalities such as computerised tomographic (CT) scan and diagnostic peritoneal lavage (DPL).

Retroperitoneal injury caused by penetrating trauma or associated with progressive shock following blunt trauma is usually recognised promptly. Isolated retroperitoneal injury from blunt trauma, unless accompanied by major haemorrhage or gross haematuria, is often difficult to diagnose. Although clinical examination remains the cornerstone of diagnosis, associated head injury or alcohol intoxication has led to increased use of other diagnostic investigations. CT scan has generally been regarded as the investigative modality of choice, whilst the use of laparoscopy in the diagnosis of retroperitoneal injuries remains inconsistent and its sensitivity questionable.

Case Report

A 17-year-old male sustained blunt abdominal trauma following a motorcycle accident. Although he was haemodynamically stable with no other injuries, his abdomen was tender and guarded with sluggish bowel sound. A diagnostic laparoscopy performed using a forward-viewing laparoscope revealed contusion of the greater omentum and minimal amount of intraperitoneal blood which was duly removed. The abdominal viscera and the intestines were grossly normal. However, the patient's general condition did not improve post-operatively and his abdomen became increasingly peritonitic. A formal laparotomy 48 hours later revealed a perforation of the third part of the duodenum posteriorly involving half its circumference, with marked contamination of the peritoneal cavity. A significant retroperitoneal haematoma was also found in the vicinity of the duodenal C loop.

This article was accepted: 30 June 2004

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Discussion

Numerous studies advocate the use of diagnostic laparoscopy for abdominal trauma[1-3], but none have documented its ability to diagnose *specific* injuries. Many authors have questioned its effectiveness in the diagnosis of blunt abdominal trauma, particularly when applied to injuries of the retroperitoneal organs. Livingston et al[1] were able to laparoscopically identify five out of six patients with retroperitoneal injuries, though the mechanism of injury was not limited to blunt abdominal trauma. Elliott et al[2] concluded that diagnostic laparoscopy possessed poor sensitivity (less than 50%) for injuries to hollow viscera. In the aforementioned case, local ischaemia could have caused a delayed duodenal perforation that was not evident during laparoscopy, or that the perforation was initially contained. Nevertheless, the fact remains that there are areas within the abdominal cavity that cannot be accurately visualized with laparoscopy. Difficulties reported include the visualization of the entire small bowel satisfactorily and the evaluation of the amount of blood loss[1]. It is perhaps not surprising that these factors, coupled with the learning curve of laparoscopy and its potential complications (one to six percent in emergency laparoscopy[3]), has led Villavicencio et al[3] to estimate 41-77% missed injury rate per patient for emergency laparoscopy.

Excessive enthusiasm for laparoscopy in trauma may induce its use when simple observation or less invasive diagnostic measures may be more appropriate. CT scan, ultrasound scanning and DPL are well established diagnostic modalities each with its own indications and limitations. Currently, diagnostic laparoscopy offers no clear advantage over CT scan in blunt abdominal trauma; its forte lies in the assessment of the need for laparotomy in penetrating wounds. To this end, diagnostic laparoscopy cannot as yet be recommended as a routine tool for patient evaluation. With the increasing popularity of minimal access surgery, it is highly probable that laparoscopy will find its niche as an integral part of evaluating and treating patients with blunt abdominal trauma, even retroperitoneal injuries. Improvement in techniques and instrumentation, with additional patient positioning such as extreme Trendelenburg and reverse Trendelenburg to facilitate a thorough examination may be some of the measures to increase its sensitivity.

In conclusion, the optimum roles for laparoscopy in trauma have yet to be established. At this juncture, laparoscopy is regarded as a safe method for the evaluation of selected, haemodynamically-stable patients with abdominal trauma and can reduce the rate of negative laparotomy. The authors advocate caution, and advise that its use should be in adjunct with sound and repeated clinical examination, and not discounting the more established imaging modalities. The role of laparoscopy in trauma is evolving, and further study of its diagnostic role and therapeutic application is clearly indicated.

References

1. Livingston DH, Tortella BJ, Blackwood J, Machiedo GW, Rush BF Jr. The role of laparoscopy in abdominal trauma. J Trauma 1992; 33: 471-5.
2. Elliot DC, Rodriquez A, Moncure M, Myers RA, Shillinglaw W, Davis F, Goldberg A, Mitchell K, McRitchie D. The accuracy of diagnostic laparoscopy in trauma patients: a prospective, controlled study. Int Surg 1998; 83: 294-8.
3. Villavicencio RT, Aucar JA. Analysis of laparoscopy in trauma. J Am Coll Surg 1999; 189: 11-20.