

Laparoscopic Entry Techniques to Avoid Visceral Injury and Other Complications – Is There a Superior Option? A Case Report and Literature Review.

Background

Visceral injury in gynaecological laparoscopic surgery is a rare but potentially life-threatening complication, usually occurring during initial peritoneal cavity entry. Despite laparoscopy being a mainstay treatment of many gynaecological conditions, the literature remains undecided regarding optimal entry technique to minimise risk of complication.

Aims

To present a case of occult small bowel injury during gynaecologic elective laparoscopic surgery and review recent literature to identify optimal laparoscopic entry techniques to avoid visceral and vascular injury.

Literature Review

A search was conducted in January 2024 using PubMed, Embase, Cochrane database and Scopus for studies on laparoscopic entry techniques in gynaecologic surgery.

20 relevant papers were selected for review out of 69 results, including one Cochrane review, four randomised control trials (RCTs), six systematic reviews, four retrospective cohort studies and four literature reviews. A summary of key findings from 11 major papers is presented.

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Case: 53-year-old woman, BMI 43, underwent laparoscopic bilateral salpingectomy and left oophorectomy for likely benign persistent left ovarian cyst (mucinous cystadenoma)

Procedure: 10mm optical entry and umbilicus with pneumoinsufflation. Ports removed under vision. No complications identified at time of procedure.

Post-operative course:

Day 1-2

Increased abdominal pain, Hb 153, WCC 24.6. Afebrile. Abdomen soft and appropriately tender. CT abdomen/ pelvis: small volume free fluid and gas in keeping with recent operation. Analgesia and inpatient management.

Day 3

Medical emergency for unrecordable blood pressure not responsive to intravenous fluid resuscitation. Repeat CT scan (**image 1**) showed large volume dense abdominal fluid along anterior lower abdominal wall and extending to liver capsule.



Image 1: Sagittal CT abdomen pelvis.

Return to theatre: (post-operative day 3)

Return for diagnostic laparoscopy. Small bowel contents evident throughout abdomen (**image 2**). General surgery attended and procedure converted to open (25cm vertical midline incision) due to anaesthetic concern. Evidence of through and through small bowel perforation, likely from 5mm or 10mm trocar. 3cm of small bowel resected with primary anastomosis (**image 3**).

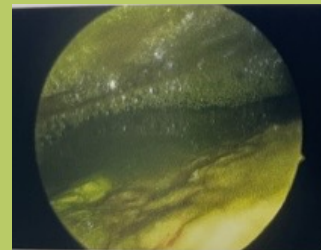


Image 2: laparoscopic image of extra-luminal small bowel contents.



Image 3: excised portion of injured small bowel.

Summary of Key Findings

- Most studies included only low risk patients, excluding those with previous abdominal surgery or high BMI.
- Direct trocar insertion is associated with fewer insufflation complications and failed entry when compared to Veress needle insufflation (at umbilicus or alternative location).^{1,2,3,4,5}
- Veress needle insufflation, Hasson (open) entry and direct trocar entry are equally safe with no significant difference in rates of visceral or vascular injury.⁴
- Three studies proposed novel entry techniques. All were associated with comparable complication rates to common entry techniques.^{6,7,8}
- Pre-operative bowel preparation does not reduce complication rates.⁹

Evidence for laparoscopic entry in obese patients:

- Meta-analysis of studies on patients with high BMI found that visceral or vascular injuries during primary laparoscopic entry were uncommon.¹⁰
- Direct trocar insertion may be an appropriate alternative to Veress needle insufflation as it reduces entry time, procedure length and therefore exposure time to anaesthetic, however there are no differences in complication rates related to entry.¹¹

Conclusion

There is insufficient evidence in recent literature to support use of one laparoscopic entry technique over another to reduce risk of visceral or vascular injury, including in obese patients. Consensus of literature supports use of entry technique most familiar to the surgeon. Different entry technique for this patient is unlikely to have impacted the outcome.

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