Iatrogenic gastric perforation during laparoscopy presenting on anaesthesia monitor

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ABSTRACT

Unfortunately, in the era of minimal access surgery, visceral injuries due to laparoscopic port insertion are common. Most such injuries are diagnosed on direct vision through a laparoscope camera. We report a case of iatrogenic gastric perforation during laparoscopy, presenting in an unusual way in the form of a very high carbon dioxide output on the anaesthesia monitor. This atypical presentation should be borne in mind while performing laparoscopy.

KEYWORDS

Gastric perforation – Laparoscopy – Anaesthesia – Laryngeal mask airway – Veress needle

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Open technique of port insertion under direct vision is the recommended method of access for laparoscopy.¹ However, many surgeons continue to practise a blind, closed technique using a Veress needle. We report a case of an iatrogenic gastric perforation by the Veress needle during a diagnostic gynaecological laparoscopy, presenting in a previously undescribed manner, on an anaesthesia monitor.

Case History

A 25-year-old woman, with a 2-year history of dysmenorrhoea of unknown cause, underwent a diagnostic gynaecological laparoscopy. She had general anaesthesia with a laryngeal mask airway (LMA). A Veress needle was inserted into the abdominal wall through a small umbilical incision and carbon dioxide (CO₂) was insufflated via the needle. The anaesthetist noticed a marked increase in expired CO₂ on the anaesthetic monitor but there was no reason apparent at the time.

The surgeon continued using the closed technique for port insertion by introducing a 5mm sharp tipped trocar through the same incision as the intra-abdominal pressures apparent on the gas insufflator were within acceptable limits. The camera was introduced and, surprisingly, an internal view of the stomach wall was seen. An inadvertent gastric perforation was diagnosed and then it was correlated that CO₂ from the Veress needle, instead of insufflating the peritoneal cavity, entered the stomach. This high pressure intragastric CO₂ escaped through the oesophagus and via

the laryngopharynx into the LMA, resulting in the described changes seen on the anaesthesia CO₂ monitor.

General surgical help was called. Diagnosis of an iatrogenic gastric perforation was confirmed by the laparoscopic view of the stomach cavity (Fig 1). A mini-laparotomy was carried out through an upper midline incision. A full-thickness anterior gastric wall perforation was seen (Fig 2) and repaired with a polyglyconate Maxon™ (Covidien, Dublin, Ireland) purse string suture. Three other serosal tears were found and repaired with a polyglactin Vicryl® (Ethicon, Somerville, NJ, US) suture. No other injury was seen. After washout of the peritoneal cavity, mass closure of the wound was carried out. Postoperatively, the patient had an uneventful recovery.

Discussion

Laparoscopy is a relatively safe procedure.² The rate of major laparoscopy complications is generally reported to be low (0.41% and 0.18% described by Orlando and Schäfer respectively) and these are mainly related to the closed technique of Veress needle and trocar insertion.^{3,4} Kane and Krejs have attributed a higher rate of major laparoscopy complications (2.3%) to underreporting by previous studies.² The Royal College of Surgeons in Ireland recommends the open Hasson technique of laparoscopy port insertion by incising the peritoneum under direct vision and inserting a blunt tipped trocar because it is associated with reduced morbidity and mortality.¹

Figure 1 Internal view of stomach pylorus seen through laparoscopic gastric perforation

Figure 2 Anterior gastric wall perforation as seen on mini-laparotomy

Direct trauma to the stomach during laparoscopy for diagnostic procedures is rare. Isolated case reports of gastric perforation on laparoscopy have been reported previously between 1972 and 2008.^{5–10} However, they all reported stomach perforation by Veress needle or laparoscopic trocar insertion, its diagnosis by direct visualisation and various methods to surgically repair such a perforation. To our knowledge, iatrogenic gastric perforation on laparoscopy presenting atypically on the anaesthesia monitor in the form of high expired CO₂ output has previously not been reported.

LMA is not a true definitive airway as it sits in the larynx without an airtight cuff around it, as opposed to an endotracheal tube, which lies in the trachea sealed with a balloon that is filled with a cuff of air.¹¹ A small fraction of ventilated anaesthetic gases from the LMA can also escape into the oesophagus, proving enough to cause gastric distension.¹¹ This increases the risk not only of iatrogenic gastric perforation during laparoscopy due to the increased size of the stomach but also of inhalation of the gastric contents owing to raised intra-abdominal pressure and the steep Trendelenburg position, which is commonly employed in such procedures.⁵

The first sign of gastric perforation by the Veress needle in our patient was a high expired CO₂ output via the LMA. If the stomach is accidentally insufflated with CO₂ by inadvertent placement of the Veress needle into the stomach, it would become distended with the pressure of the gas. The gas would escape into the oesophagus and then from the laryngopharynx into the LMA. Such a presentation of iatrogenic gastric perforation during laparoscopy has not been reported previously in the literature. The occurrence of high expired CO₂ output via the LMA could be used as a helpful and timely way to pick up inadvertent gastric perforation.

Conclusions

The possibility of iatrogenic gastric perforation during laparoscopy presenting in an atypical way, namely as a very high CO₂ output on the anaesthesia monitor, should be borne in mind while performing laparoscopy. A definitive airway in the form of a cuffed endotracheal tube should be used for such procedures. All laparoscopic port insertions should be carried out using the open Hasson technique.

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