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Anesthetic management of the SRS™ endoscopic stapling system for gastro-esophageal reflux disease

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Abstract

The SRS™ Endoscopic Stapling System (Medigus, Tel Aviv, Israel) is a new tool capable of creating a totally endoscopic fundoplication, combined with an endoscope, endoscopic ultrasound and a surgical stapler. SRS™ endoscopic stapling for gastro-esophageal reflux disease is a minimally invasive, outpatient procedure, which requires general anesthesia with positive-pressure ventilation. Keeping the patient on positive end-expiratory pressure (PEEP) may minimize the pressure gradient between the esophagus and the mediastinum, as well as help to prevent air from leaking around the screws and causing pneumomediastinum. In addition, in patients with hiatal hernia, higher PEEP levels may be required to increase intra-thoracic pressure and to force the stomach to slide into the abdomen for ease of endoscopy. We advise smoother emergence from anesthesia, taking precautions for retching, postoperative nausea and vomiting (PONV), while coughing and gagging during extubation and PONV may affect the success of the procedure. Total intravenous anesthesia with propofol and remifentanil seems to be a good choice for these reasons.

Key words: Gastro-esophageal reflux disease; Endoscopy; Anesthesia; SRS™ endoscopic stapling system; Positive end-expiratory pressure

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TO THE EDITOR

Endoscopic ultrasound was developed as a useful diagnostic tool and is being used in the treatment of various gastrointestinal diseases[1,2]. The SRS™ Endoscopic Stapling System (Medigus, Tel Aviv, Israel) is a new tool capable of creating a totally endoscopic fundoplication, combined with an endoscope, endoscopic ultrasound, and a surgical stapler[3]. This modified endoscope fires 3 rows of staples plicating the fundus onto the esophagus. While the anesthesia management of the SRS™ endoscopic fundoplication procedure has not been described, we would like to share our initial experiences with it on 12 patients.

After obtaining written informed consent, patients diagnosed with gastro-esophageal reflux disease, without or with ≤ 3 cm hiatal hernia, were scheduled for this procedure. Following at least 8 h fasting time, patients were premedicated with midazolam, metoclopramide, and a proton pump inhibitor. Total intravenous anesthesia (TIVA) with propofol and remifentanil was used for both induction and maintenance of general anesthesia. After muscle relaxation was achieved with rocuronium, patients were endotracheally intubated. Patients were mechanically ventilated with oxygen/air mixture. During the procedure, the lumen of the stomach was inflated with air for better visualization. To prevent possible air leakage,

positive end-expiratory pressure (PEEP) 4-6 mmHg was applied. If a hiatal hernia was discovered during preliminary gastroscopy, the patient should be tilted 15 degrees head up and the PEEP level must be increased to 7-10 mmHg in order to depress the diaphragm and reduce the gastro-esophageal junction, so that it can be repositioned into the abdomen. Mean interventional time was 75 min; range was between 47-102 min according to the expertise of the operator. Paracetamol 1 g *iv* was administered for postoperative analgesia and ondansetron 4 mg *iv* for postoperative nausea and vomiting (PONV). Recovery was uneventful in all patients.

In conclusion, SRS™ endoscopic fundoplication for gastro-esophageal reflux disease is a minimally invasive, outpatient procedure, which requires general anesthesia with positive-pressure ventilation. Keeping the patient on PEEP may minimize the pressure gradient between the esophagus and the mediastinum and may help to prevent air from leaking around the screws and causing pneumomediastinum. In patients with hiatal hernia, higher PEEP levels may be required to increase intra-thoracic pressure and force the stomach to slide into the abdomen for ease of endoscopy. It must be kept in mind that higher PEEP levels may be associated with arterial hypotension. We advise smoother emergence from anesthesia, taking precautions for retching, PONV, while coughing and gagging during extubation and PONV may affect the success of the procedure. TIVA with propofol and remifentanil seems to be a good choice for these reasons.

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