ECRONICON OPEN ACCESS

EC ANAESTHESIA
Short Communication

Anesthesia Management for Poem Procedure at the Advanced Endoscopy Unit

Maroje A Turk[1]* and Jose M Nieto[2]

[1]*Department of Anesthesiology, Baptist Health, Jacksonville, Florida, USA*
[2]*Department of Gastroenterology, Baptist Health, Jacksonville, Florida, USA*

***Corresponding Author:** Maroje A Turk, Department of Anesthesiology, Baptist Health, Jacksonville, Florida, USA.

Received: October 24, 2017; **Published:** November 08, 2017

Per Oral Endoscopic Myotomy (POEM) is a non-invasive form of treatment for esophageal achalasia, a motility disorder that develops in the esophagus.

Achalasia prevents the esophagus from properly moving food towards the stomach, inhibiting one's ability to swallow. Achalasia is involving the smooth muscle layer of the esophagus and the lower esophageal sphincter (LES) [1].

It is characterized by incomplete LES relaxation, increased LES tone, and lack of peristalsis of the esophagus (inability of smooth muscle to move food down the esophagus). This most commonly develops as a result of nerve damage to the esophagus, but can also occur secondary to other conditions like cancer or parasitic infection [2-4].

Achalasia treatment can be conservative like medications, endoscopies with dilation and botox injections. Surgery option is Heller myotomy which is very invasive and requires laparoscopic surgery. Less invasive procedure is POEM - Per Oral Endoscopic Myotomy. It is newer procedure that does not require incisions and patients are discharged home sooner. In POEM, the endoscopist passes an electrical scalpel through the endoscope to make an incision in the lining of the esophagus and to create a tunnel within the submucosa wall of the esophagus (between the inner lining of the esophagus and the outer muscle layer of the esophagus). The endoscope is advanced into that tunnel, and the muscle of the esophagus can be cut using an electrical scalpel device that is passed through the endoscope.

We performed our procedures under general endotracheal anesthesia at the advanced endoscopy suite with existent anesthesia machine Datex-Ohmeda Aespire View and same anesthesia carts as for typical OR setup for administration of general anesthesia. POEM can be done at endoscopy suite however this requires full equipment for general anesthesia continuously present in dedicated room. Certainly it would be very difficult to perform POEM in smaller older endoscopy suite without anesthesia machine because patients require controlled ventilation.

Patients were NPO and achalasia was confirmed with endoscopies, motility studies and previous history. Some patients had previous failed treatment with medications or dilation with botox injections and some had failed Heller myotomy surgery.

The procedure was performed with senior consultant gastroenterologist with fellowship and training in advanced endoscopy procedures and anesthesia was performed with experienced consultant anesthesiologist.

Prior procedure all patients were kept on stretchers and were pre-medicated with antiemetics and sedatives as needed. Antibiotics were started after induction of general anesthesia. ASA standard monitors were placed. Nasal temperature monitor was placed and BIS monitor was used to achieve adequate depth of anesthesia. All modified rapid inductions are performed on patients on supine position and with assistant providing adequate cricoid pressure during intubation. In all our patients we performed intubation with Glidescope video laryngoscope and rationale behind this was to elicit minimal stimulation during laryngoscopy to avoid potential food regurgitation

and aspiration. Many patients with achalasia have retained food fragments in the esophagus and potentially can make procedure more challenging as retained fragments need to be removed. The endotracheal tube was secured to the right corner of the mouth and bite block for endoscope was inserted in the midline. Patient position is supine with head straight and extremities free of any pressure and with compression device for DVT prophylaxis. Lower body Bair Hugger warming blanket was placed. Modified rapid sequence was performed with propofol, fentanyl and rocuronium. Twitch monitor was applied to ensure adequate muscle relaxation. Deep muscle relaxation ensures optimal quiet conditions for operator since relaxation of esophageal muscles for this type of procedure is paramount. Anesthesia was maintained with sevoflurane, air and oxygen, and paralysis with rocuronium was maintained with 0 or 1 twitch.

Monitoring of both peak (P_{max}) and plateau pulmonary (P_{plat}) pressures and type of ventilation mode (pressure or volume) is extremely important. In our case we preferred controlled ventilation to decrease minute ventilation because delivering smaller tidal volumes with higher rates can reduce P_{max} pressures down. If the difference between peak and plateau pressures is low (less than 3), and both are elevated increased airway pressure could be secondary to acute decrease of lung compliance, increased elastic work and possible complications as pneumo/capnothorax, pneumo/capnomediatinum, pneumo/capnoperitoneum, and subcutaneous emphysema [5]. The goal plateau pressure should be < 30 cm H_2O to prevent barotrauma; that is lung injury secondary to overdistension of alveoli. Without lung disease, peak inspiratory pressure (P_{max}) is only slightly above the plateau pressure. In cases of increased tidal volume or decreased pulmonary compliance, the P_{max} and P_{plat} pressure rise together proportionately [6,7].

Our peak inspiratory pressures were maintained between 18 - 25 cm H_2O and end tidal CO_2 value was maintained between 30 - 32 mm Hg. Following insufflation of CO_2 our end tidal CO_2 value increased for only 1-2 mm Hg. This values in controlled ventilation can be adjusted as case per case basis and depending of patient conditions but our goal was to minimize patient's pulmonary pressures [8-10].

Results depends on operator hands. We had zero complications in 19 case and mean duration times for anesthesia and surgery were 90 and 60 minutes respectively. In our practice we had 0 incidence of escaping the CO_2 in chest (capnomediastinum or capnothorax). Capnomediastinum in our case was insignificant. There was no significant bleeding and minor intraoperative bleeding visualized on monitor was managed successfully with hemostatic forceps and clips.

Most patients required reversal of rocuronium with sugammadex at the end of procedure. During second half of procedure dilaudid was administered as part of postoperative pain management. In our practice we did not use IV acetaminophen we used one dose of IV ketorolac however it can be administered as a part of ERAS (enhanced recovery after surgery) protocol of multimodal analgesia. All our patients received anti-nausea cocktail with ondasetron, dexamethasone and promethazine.

All patients were extubated at the end of procedure on the stretcher and transported to PACU recovery unit. Patients were kept overnight before discharge for observation. Additional dilaudid was administered in recovery for pain if necessary but overall we tried to minimize use of additional narcotics in PACU.

In conclusion from our experience in administration of anesthesia for advanced peroral endoscopic myotomy procedure four points are very important. 1) First, induction of anesthesia requires minimal and gentle stimulation with rapid sequence intubation to avoid possible aspiration. 2) Maximal paralysis for optimal endoscopic surgical conditions. 3) Proper adjustment of ventilation to attenuate elevations in peak pressures and monitoring both peak and plateau pulmonary pressures for signs of respiratory distress. 4) multimodal pain management and anti-nausea protocol for rapid recovery.

Bibliography

1. Park W and Vaezi M. "Etiology and pathogenesis of achalasia: the current understanding". *American Journal of Gastroenterology* 100.6 (2005): 1404-1414.

2. Spechler SJ and Castell DO. "Classification of oesophageal motility abnormalities". *Gut* 49.1 (2001): 145-151.

3. Pandolfino JE and Kahrilas PJ. "AGA technical review on the clinical use of esophageal manometry". *Gastroenterology* 128.1 (2005): 209-224.

4. Pandolfino JE and Gawron AJ. "Achalasia: a systematic review". *Journal of the American Medical Association* 313.18 (2015): 1841-1852.

5. Jain M and Sznajder J. "Bench-to-bedside review: distal airways in acute respiratory distress syndrome". *Critical Care* 11.1 (2007): 206.

6. Löser B., *et al*. "Anesthetic considerations for patients with esophageal achalasia undergoing peroral endoscopic myotomy: a retrospective case series review". *Canadian Journal of Anesthesia* 64.5 (2017): 480-488.

7. Dennis Yang., *et al*. "Evaluation of anesthesia management, feasibility and efficacy of peroral endoscopic myotomy (POEM) for achalasia performed in the endoscopy unit". *Endoscopy International Open* 3.4 (2005): E289-E295.

8. Tanaka E., *et al*. "Anesthetic management of peroral endoscopic myotomy for esophageal achalasia: a retrospective case series". *Journal of Anesthesia* 28.3 (2014): 456-459.

9. Sanaka MR., *et al*. "Efficacy of peroral endoscopic myotomy vs other achalasia treatments improving esophageal function". *World Journal of Gastroenterology* 22.20 (2016): 4918-4925.

10. Nithin Jayan., *et al*. "Anesthesia for peroral endoscopic myotomy: A retrospective case series". *Journal of Anesthesiology, Clinical Pharmacology* 32.3 (2016): 379-381.

Volume 3 Issue 2 November 2017