

## Case Report

# Anesthetic Management of a Minimally Invasive Laparoscopic Trans hiatal Oesophgectomy

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## Abstract

Careful monitoring and adjustment of anesthetic technique minimize the complications and improve the outcome of laparoscopic trans hiatal esophagostomy.

## Key words

Laparoscopy, Trans hiatal oesophagectomy.

## Introduction

Trans hiatal oesophagectomy was introduced by Orringer to reduce the morbidity of thoracotomy. In this technique oesophagus is “blindly” mobilized through hiatus [1]. However inadequacy of clearance, risks of bleeding, cardiac arrhythmias and tracheal injuries [1, 2] are reported complications. These can be minimized by doing the procedure laparoscopically, where the dissection via the hiatus is done under vision of the camera. However the anesthetist has to face additional challenges of the pneumoperitoneum and pneumomediastinum. Using gas of room temperature may induce hypothermia.

The case presented illustrates anesthetic management of a minimally invasive laparoscopic trans hiatal oesophagectomy with uneventful intraoperative period.

## Case report

A 63 years old male was scheduled for a laparoscopic trans hiatal oesophagectomy for a squamous cell carcinoma at 43 cm. He had a 2:1 heart block in the ECG but Echocardiography revealed good left ventricular function and structurally normal heart. Thoracic epidural was inserted. Rapid sequence induction and intubation with size 8 cuffed endotracheal tube was done. Anesthesia was maintained with Oxygen, N<sub>2</sub>O in Isoflurane with Morphine and intermittent boluses of Atracurium.

Heart rate remained regular with occasional ectopic beats, which were uncomplicated. Mean blood pressure was between 65-80 mmHg. Initial central venous pressure was 6 cmH<sub>2</sub>O. After creation of pneumoperitoneum of 14 mmHg, central venous pressure (CVP) rose to 20cm H<sub>2</sub>O. During mediastinal dissection insufflation pressure was raised to 18mmHg, which however

didn't cause a change of CVP or blood pressure. Oxygen saturation remained more than 98% with 50% of oxygen and PaO<sub>2</sub> maintained between 150-170 mmHg. The CO<sub>2</sub> utilizations were 104 litres during the laparoscopic phase and 405 liters during the mediastinal dissections. But PaCO<sub>2</sub> was maintained between 35-45 mmHg with regular adjustments to ventilation. Peak airway pressure was 14 cmH<sub>2</sub>O initially and increased to 21 cmH<sub>2</sub>O with the pneumoperitoneum. Temperature dropped to 35C<sup>0</sup> after induction and remained 35C<sup>0</sup>-36C<sup>0</sup> throughout the surgery. Urine output was more than 0.5ml/kg/hr. Once neck dissection began gas insufflation was stopped and CVP dropped to 6mcmH<sub>2</sub>O. The duration of surgery was as follows; laparoscopic dissection 1 hour 30 minutes, mediastinal phase 2 hours 45 minutes and neck dissection and anastomosis one hour. Blood loss was <200ml. Total of 2 litres of crystalloids (1.5 l Normal Saline, 0.5 l of Hartman's solution) and 10ml/kg of fresh frozen plasma was used during the surgery.

## Discussion

Trans hiatal oesophagectomy is a widely used techniques to treat carcinoma, strictures and motility disorders of the oesophagus. Though considered to be a safe and expeditious technique, it is accompanied by complications such as massive bleeding, tracheobronchial disruption, pneumothorax and chylothorax [3, 4, 5]. Laparoscopic trans hiatal oesophagectomy enables direct visualisation of the mediastinum with an accurate and meticulous dissection of the mediastinal oesophagus and lymph nodes. It has the potential advantages of being a less traumatic procedure with an easier post-operative recovery and fewer wound and pulmonary complications.

Pneumoperitonium and pneumomediastinum greatly influence the anaesthesia. It also can affect the monitoring such as CVP, blood

pressure and mean airway pressure. Relying on CVP trends than the single value, along with measurement of pulse, blood pressure and urine output were used to guide fluid management. In spite of 605 litres of CO<sub>2</sub> being used, PaCO<sub>2</sub> was maintained within normal range. This was by adjustment of ventilation guided by end tidal CO<sub>2</sub> and blood gas analysis. Airway pressure can be influenced by pneumoperitonium and pneumomediastinum. Regular adjustment of tidal volume and respiratory rate with PEEP minimized the effects of increased airway pressure. Hypothermia was prevented by using fluid warmers and forced air warming blankets [6].

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