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## Anaesthetic management of diaphragmatic hernia in elderly woman: A case report

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### Abstract

Anteromedial sub costosternal defects, also referred as Morgagni diaphragmatic hernia, is the potentially life-threatening herniation of the abdominal contents into the thorax. Being only a small fraction of all types of congenital diaphragmatic hernias, precise diagnosis of Morgagni Hernia is often deferred, owing to the nonspecific associated respiratory and gastrointestinal symptoms. Once recognized, the primary management for both symptomatic and asymptomatic cases are surgical repair as there is increased risk of strangulation of hernia contents. Various abdominal and thoracic surgical repair approaches have been described. Cardiopulmonary compromise due to the hernial content's mass effect on heart, lungs, and risk of strangulation poses a great challenge to anaesthesiologists. This case highlights the key feature of the effective anaesthetic management of adult-onset Morgagni hernia posted for laparoscopic repair.

**Keywords:** Diaphragmatic hernia, morgagni hernia, Laparoscopic repair, anaesthesia, double lumen tube

### Introduction

Morgagni Hernia (MH) was first described by Giovanni Battista Morgagni, an Italian pathologist and anatomist in the year 1769 <sup>[1]</sup>. He is regarded as the father of modern anatomical pathology <sup>[2]</sup>. Out of all the diaphragmatic hernia, Morgagni hernia constitutes only about 2 to 4 percentage. Morgagni hernia is an anteromedial subcostosternal diaphragmatic hernia. Although most of the Morgagni Hernias present as a failure to thrive or recurring respiratory distress or failure to thrive in infants, in some incidences, a Morgagni Hernia is identified incidentally in adults. The symptomatic adult patients are extremely rare in such cases <sup>[3]</sup>. If symptoms occur, they may present with respiratory symptoms or with intestinal obstruction <sup>[4]</sup>.

The accurate diagnosis of Morgagni Hernia in adults is hence, often delayed. In the literature various surgical options have been described such as thoracic repairs by median sternotomy, thoracoscopy and thoracotomy besides abdominal approaches through laparotomy and laparoscopy. We report a rare case of Morgagni type of congenital diaphragmatic hernia presenting in an adult female with clinical presentation of breathlessness, who improved after laparoscopic surgical repair.

### Presentation of case

A 39-year-old female came to surgical OPD with a 6-month history of intermittent episodes of breathlessness. The breathlessness was aggravated in supine position. There was no history of vomiting, dysphagia, jaundice, altered bowel or bladder habits. Patient had past history of LSCS, 10 years back. His vital signs were within normal. On examination, there was reduced air entry in the axillary, infra-axillary and subscapular region on the left side. Abdominal examination showed Previous LSCS scar and palpable spleen. Laboratory test results were under normal limits.

An antero-lateral chest X-ray (Fig. 1) showed left CP angle blunting with gas-filled bowel loop and mediastinal shift to the right. A subsequent CT chest showed high placed left dome of diaphragm with small and large bowed loops at the level of cardia. There was mild mediastinal shift to the left and partial atelectasis of the lower lobe of the left lung. The patient was diagnosed with late onset Morgagni Left Diaphragmatic hernia and scheduled for laparoscopic hernia repair.

### Pre-operative evaluation

During preanesthetic evaluation, patient was found mildly tachypneic but maintaining oxygen saturation (SpO<sub>2</sub>) 98% on room air. Airway examination showed adequate mouth opening and neck movement, MMP -II, TMD of more than 3 finger widths and systemic examination showed decreased air entry in the left middle and lower lobes of the lung. Pre-assessment evaluation showed laboratory investigations, ECG and ECHO within normal limits. Pulmonary function test showed restrictive lung pattern. Combined balanced general anaesthesia With Epidural was planned. Informed written consent high risk consent obtained. Post-operative ventilator bed with one unit of blood cross matched and reserved. Pt was advised to do chest physiotherapy and incentive spirometry and was put on bronchodilator cover before surgery.



**Fig 1:** pre operative x ray showing left CP angle blunting with gas- filled bowel loop and mediastinal shift to the right

### Intra operative management

Her vitals on arrival to OT were blood pressure 120/60, heart rate 70 beats per minute, respiratory rate 25 breaths per minute and temperature 37 °C and Oxygen saturation 97% room air. Aspiration prophylaxis was given. Epidural line secured at T11- T12 level before intubation. Iv Injection Glycopyrrolate 0.2 mg and Injection midazolam 1 mg was given as premedication. After preoxygenation, RSI with cricoid pressure performed using Injection Fentanyl 100 mcg, Injection Propofol 100 mg and Injection Succinylcholine 75 mg.

Patient was intubated with right sided Double lumen tube (DLT) 32Fr, Injection Atracurium, Sevoflurane, 50% oxygen and air (1:1) was given as maintenance. MAC was maintained at around 0.5 to 0.6 with epidural infusion 0.25% Bupivacaine at 6 to 8 ml/hr. Lung isolation technique was used during defect repair.

During OLV, SpO<sub>2</sub> decreased to 96% and after PEEP it got improved to 98 to 100%. Routine intra-operative monitoring was done. After the repair, patient was extubated after adequate oral suctioning and reversal. Post extubation was uneventful.



**Fig 2:** Intra operative picture showing Laproscopic repair

### Post-operative management

Patient was shifted to Intensive care unit for observation and further management. Epidural infusion (0.125% Bupivacaine @5ml/hour) for pain relief and Lung physiotherapy, Incentive spirometry was advised. Repeat Pulmonary function test showed improvement. As the patient improved clinically and PFT also showed improvement patient was shifted toward after 1 day of ICU stay and subsequently discharged on post-operative day 5.

### Discussion

Morgagni Hernia, a congenital diaphragmatic hernia usually occurs in adults. It comprises of only 2 percent of all the diaphragmatic hernias [5]. Morgagni Hernia often befalls due to an anteromedial diaphragmatic defect. Such defect usually happens as a result of failure of fusion of diaphragm with the costal arches [6]. 91% of the time it occurs on the right side of the sternum 5% in the left side; which is the same side as in our patient and only 4% of reported cases are bilateral [7]. A review [3] has shown that the maximum dimension of the defect is 7.5 cm. Most of the time Morgagni Hernia remains asymptomatic and only a few rare adult cases are symptomatic [3, 8]. Among those with symptoms, 34% presents with respiratory symptoms [3] including dyspnoea, cough, and chest pain. Our patient's main presenting complaint was breathlessness without any other respiratory symptoms. New-onset respiratory symptoms in a previously asymptomatic patients may be an early sign of progression of Morgagni Hernia [9]. Trauma, Pregnancy, obesity, chronic cough and chronic constipation are the common predisposing factors for the development of Morgagni Hernia. It can also result from Exercise and other types of exertion [10]. Literature has shown that [9] women usually presents after 50 years of age and men presents earlier. However, our female patient presented much earlier at the age of 39 years.

On systemic evaluation, one can pick up the findings, and still, Chest X-ray and Contrast Enhanced Computerized Tomography (CECT) of the chest and abdomen remain the gold standard in diagnosing these cases. Early diagnosis and proper management of symptomatic Diaphragmatic Hernia is appropriate, otherwise, patients may present with acute bowel obstruction or cardiorespiratory distress, pulmonary hypertension, and may land up in complications and emergency surgery. Amongst different surgical approaches, laparoscopic repair is considered safe and effective. But there are more chances of pneumothorax and very high airway pressures during the procedure. As in our case, all the necessary precautions were taken and the case was managed well with a good patient outcome. Anaesthetic management

of such adult type of CDH are very challenging to anaesthesiologists in every stage that could be in proper planning of anaesthetic technique and preoperative optimisation, considering them as full stomach and providing required aspiration prophylaxis, all the necessary modalities for hemodynamic monitoring and always anticipating a difficult airway and keeping a difficult airway cart ready is a must.

Morgagni Hernia patients require aspiration prophylaxis because of the probable gastrointestinal obstruction. Insertion and aspiration using Nasogastric tube before induction is thus necessary. Our patient had aspiration prophylaxis before shifting to OT. Large gauge IV access is needed to treat in case of any hemodynamic instability. Our patient had 16-gauge IV line secured.

Whenever possible, awake fibreoptic intubation or rapid sequence induction with cricoid pressure should be considered. The gold standard otherwise rapid sequence induction with cricoid pressure must be considered. Our patient had RSI with cricoid pressure and was intubated with left sided DLT 32Fr. In case of collapsed lung, it shouldn't be inflated to evade the combined mass effect of inflated effect and herniated viscera and inflated lung. In such cases DLT will be helpful. Anaesthetic agents with cardiac depressant effect should be avoided. In our case we used low dose Fentanyl, Propofol and Succinylcholine was used. Anything which may raise the intra-abdominal pressure is harmful. Positive pressure ventilation with potential gastric insufflation and expansion of compressed lung may decrease venous return and thereby cardiac output. Literature recommends low airway pressure and low tidal volume strategy <sup>[13]</sup>. Nitrous oxide should be avoided as it may worsen the mass effect.

Post-operative effective pain relief can reduce the incidence of postoperative pulmonary complications and lung physiotherapy with incentive spirometry can help in better chest expansion and early recovery.

### Conclusion

Anaesthetic management of Morgagni repair in adult patients is challenging for anaesthesiologists and requires special care. Aspiration prophylaxis, awake fibreoptic intubation or rapid sequence induction, lung isolation technique, meticulous monitoring, adequate plane of anaesthesia and avoidance of nitrous oxide is the key of successful anaesthetic management.

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