

# Anesthesia For Thoracotomy In Kartagener's Syndrome

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## Abstract

Kartagener's syndrome (KGS) is an inherited disease characterized by bronchiectasis, situs inversus totalis and sinusitis. We report a case of thoracotomy and lobectomy in a 12-year-old male patient with KGS.

A 12-year-old male patient with KGS was admitted in our hospital due to repeated chest infections and suppurative productive cough since childhood. He was operated for thoracotomy and right lower lobectomy under general anesthesia. Trachea was intubated with Univent tube and the blocker was placed guided with fiberoptic bronchoscope in the right main bronchus. Post operative analgesia was achieved by thoracic epidural catheter. To the best of our knowledge this is the first case report of KGS underwent thoracotomy and lobectomy with use of Univent tube for lung isolation.

## INTRODUCTION

Kartagener's syndrome (KGS) is an inherited disease characterized by bronchiectasis, situs inversus totalis and sinusitis. The syndrome was first coined by Siewert in 1904 and later described by Kartagener in 1933 (1). We report a case of thoracotomy and lobectomy in an 12-year-old male patient with KGS.

## CASE REPORT

A 12-year-old male patient with KGS was admitted in our hospital due to repeated chest infections and suppurative productive cough since childhood. The patient had received medical treatment in the form of antibiotics and chest physiotherapy with postural drainage several times with no improvement. On examination, there was no clubbing and the apex beat was on the right side. On auscultation, there was normal and no added heart sounds, besides right lower basal crepitations on the right lung field. ECG showed sinus rhythm with non significant t wave inversion in lead II. Full blood count revealed high WBC count of  $>19.4 \times 10^9/L$ , high neutrophil% of  $>85.7$  and high neutrophil count of  $>16.6 \times 10^9/L$ . Chest-x ray revealed dextrocardia and right lower lobe collapse.

The chest-x ray revealed anatomical right lung in the left hemithorax as evidences by the large size of the lung and nearly straight line between the trachea and left main bronchus versus acute angle on the right side. Also chest-x

ray showed near take off origin of the right upper lobe bronchus suggestive as well of anatomical right lung in the left hemithorax (Figure 1).

## Figure 1

Figure 1: Chest-X-ray shows dextrocardia with anatomical left lung in right hemithorax. Also stomach is on right side.



CT scan showed situs inversus totalis picture with stomach on the right side and liver on left side. There was collapse of the right lower lobe with varicose bronchiectasis. Air and fluid bronchogram seen in the collapsed right lower lobe

suggest stagnation of the mucosa as a cause of collapse. There was mild atelectasis with crowding of the vessels seen in the right upper lobe. Patches of lobular ground glass and linear fibroatelectatic bands seen in the left middle lobe. Also, there was associated bronchial wall thickening suggestive of chronic bronchial inflammation as the cause of the above mentioned findings with hyperinflation of both lung fields. CT scan confirmed the presence of anatomical right lung in the left hemithorax (Figure 2). The patient was scheduled to undergo right lower lobectomy under general anesthesia.

### Figure 2

Figure 2: CT scan of lungs shows the honey comb appearance of right lower lobe bronchiectasis.



Preoperative preparation included antibiotics, incentive spirometry and postural drainage for three days. Premedication was achieved with oral lorazepam two hours preoperatively. In the operation theatre, routine monitoring were established, pulse oximeter, ECG and non-invasive blood pressure. Induction of anesthesia was achieved with propofol 3mg/kg b.w followed by rocuronium 1mg/kg b.w to facilitate endotracheal intubation. Maintenance of anesthesia was achieved with Sevoflurane/O<sub>2</sub>/Air mixture.

Analgesia was maintained with i.v fentanyl when required. Muscle relaxation was maintained with incremental dosages of rocuronium when required. The trachea was intubated with Univent tube size 6.5mm (Fuji, Japan). The blocker was placed in the right main bronchus guided with fiberoptic bronchoscope (FOB). Immediately after positioning the

blocker, its pilot cuff was inflated with 7cc air to achieve right lung isolation. Radial arterial artery cannulation then was performed and also right internal jugular vein was cannulated. Ventilation was adjusted to maintain normal arterial oxygenation and end tidal CO<sub>2</sub> during one lung ventilation (OLV). Right lower lobe lobectomy was performed uneventfully with minimal blood loss. The surgeon confirmed the anatomical left lung in the right hemithorax. At the end of surgery a thoracic epidural catheter was inserted at complete aseptic technique for postoperative pain relief. Reversal of muscle relaxation was achieved with atropine/neostigmine in appropriate dosages. The trachea was then extubated after deflating the blocker balloon. The patient then transferred to high dependency unit (HDU) for further observation. Pain relief was successfully achieved with epidural analgesia using bupivacaine 0.0625% and Fentanyl 2mic/ml at rate of 4-5ml/hr. The patient remained for two days in the HDU then he was transferred to surgical floor. Seven days later he was discharged home after full recovery.

### DISCUSSION

KGS is an inherited disease first described in 1933, characterized by sinusitis, bronchiectasis and situs inversus. There are few scattered reports on patients with this syndrome underwent different surgical procedures. In one report bilateral breast surgery was performed in KGS patient using laryngeal mask airway (LMA) after proper preoperative preparation (2). In another report, laparoscopic cholecystectomy was performed in KGS patient with special reference to the problems of the syndrome (3). Combined spinal epidural was described as technique of choice for a patient with KGS presented for utero- vaginal prolapse with uneventful outcome (4). In a similar report to our case, Sahajananda et al, reported a successful general anesthesia for lobectomy in a 8-year-old child with KGS. The authors used modified single lumen tube advanced into the left bronchus to achieve lung isolation (5). In another similar report, left middle lobectomy was successfully managed in KGS patient using right sided double lumen tube (DLT) for lung isolation (6). Proper lung isolation is important in KGS patient undergoing lobectomy surgery because it protects the other lung from being spoiled by the suppurative secretions of the diseased lung. Lung isolation techniques in pediatrics is challenging to anesthesiologists.

The smallest available size of DLT is 26Fr, with large outside diameter. That size may fit a patient not less than 12yr old. Again due to distortion of anatomy of the

tracheobronchial tree and high take off of the left upper lung lobe in KGS, using and proper placement of DLT presents real difficulty. For that reason we thought to use Univent tube size 6.5mm.

In conclusions, we have presented a case of successful anesthetic management of thoracotomy and lobectomy in an 12 yr old child with KGS. We have used Univent tube to achieve lung isolation. To the best of our knowledge, this is the first report on using Univent tube for lobectomy in KGS patient. We believe, due to distorted and inversus anatomy in KGS, Univent tube is the best choice for lung isolation versus DLT.

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