# THE ROLE OF THORACOSCOPY IN MANAGEMENT OF PRIMARY LUNG LESIONS IN PEDIATRICS

Thesis

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# Abstract

**Thoracoscopy has become a important wide field in field in front of pediatric surgeon The Limited explorations debridements and biopsies described the mid to late 1970s have Become replaced by eztensive tehnically demanding resections and reconstructive Procedures It has been stated in our study that thoracoscopic lobectomy and Thoracoscopic lung biopsy are feasible safe and effective Recent technologic advances Have made the procedures technically easier with operating time similar to or in some Cases faster than that associated with open thoracotomy.**



## Key words;

**Primany long lesions - Thora loscery. Long biopy - lobeetomy.**

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Endo GIA stapler:Endo GastroIntestinal Anastomosis stapler.

PEEP:Peak End Expiratory Pressure.

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# Introduction and Aim of Work

# Introduction

Initially,the Greek"thoraco" means chest and "skopein" means to examine.The drive to adapt the technology of video-assisted thoracoscopy to general surgical procedures came not from the academic surgical background, but from the private sector, spurred by public interest in and demand for its advantages such as improved cosmesis, decreased pain, short hospital stay, and quicker return to normal preoperative lifestyle.[5]

Diagnostic and therapeutic thoracoscopy was reported by the Swedish internist **Hans Jacobeus** in 1919.He used a trocar and cystoscope with local anesthesia to drain pleural effusion and perform thoracoscopy.For the next forty years thoracoscopy was primarily used for lysis of adhesions ( pneumolysis ) and treatment of tuberculosis.In the 1960s and early 1970s scattered reports of thoracoscopy generally using rigid instruments with distal light sources appeared.Video-assisted thoracoscopy developped in the 1980s and 1990s in parallel with the development of video-assisted laparoscopy.The first atlas and textbook on laparoscopy and thoracoscopy was written and published by **Roger Korbsch** of Munich, Germany, in 1927; in this text he expanded the indications for these procedures to include any disorder of these cavities that could not be diagnosed by other methods. [6]

Primary lung diseases are parenchymal lung diseases that originate in the lung(not originating from the pleura and not secondary to distant proplem).Video-assisted thoracoscopy procedures are now used for diagnosis and management of hundreds of primary lung diseases in pediatrics such as lobar emphysema, interstitial lung diseases, intrapulmonary sequestration, cystic adenomatoid malformation and pumonary tumours.[5]

## Aim of work

Demonstration of safety and efficacy of thoracoscopy in diagnosis and management of primary lung diseases in pediatric age group.

# REVIEW OF LITERATURE

# EMBRYOGENESIS

## **Normal lung development**:(Figure :1)

During fourth week of development ,primordium of the lower respiratory tract appears to start with an opening at the ventral pharyngeal wall of the foregut.This opening is ,the respiratory diverticulum ,which will in turn produce respiratory epithelium.(1)

The respiratory diverticulum grows carrying with it the mesenchyme.It finally separates from the pharynx (which represents the cranial part of the foregut) by the two oesophagotracheal ridges .These ridges unite and form the oesophagotracheal septum . This oesophagotracheal septum divides the cranial part of the foregut into an anterior (ventral) part (laryngotracheal tube) and posterior dorsal part (oesophagus). The mesenchyme produces connective tissue , muscles and cartilages for larynx , trachea, and lungs.Epithelium and glands of trachea and lungs are endodermal origin .(3)

## Prenatal lung:

During the fourth and fifth weeks ,two asymmetrical phenomena occur.**First** ,26 days after fertilization ,the tracheal end of the diverticulum, which is still the respiratory diverticulum ,produces the two lung buds.The bronchial buds enlarge to form the primordial of the right and left bronchi.The former has a caudal pathway and the latter an oblique one.The **second** asymmetrical phenomenon is the production during the fifth week of two lateral buds on the right bronchus and only one on the left.The bronchial tree subdivides within the lung buds (the so-called infundibula).(3)

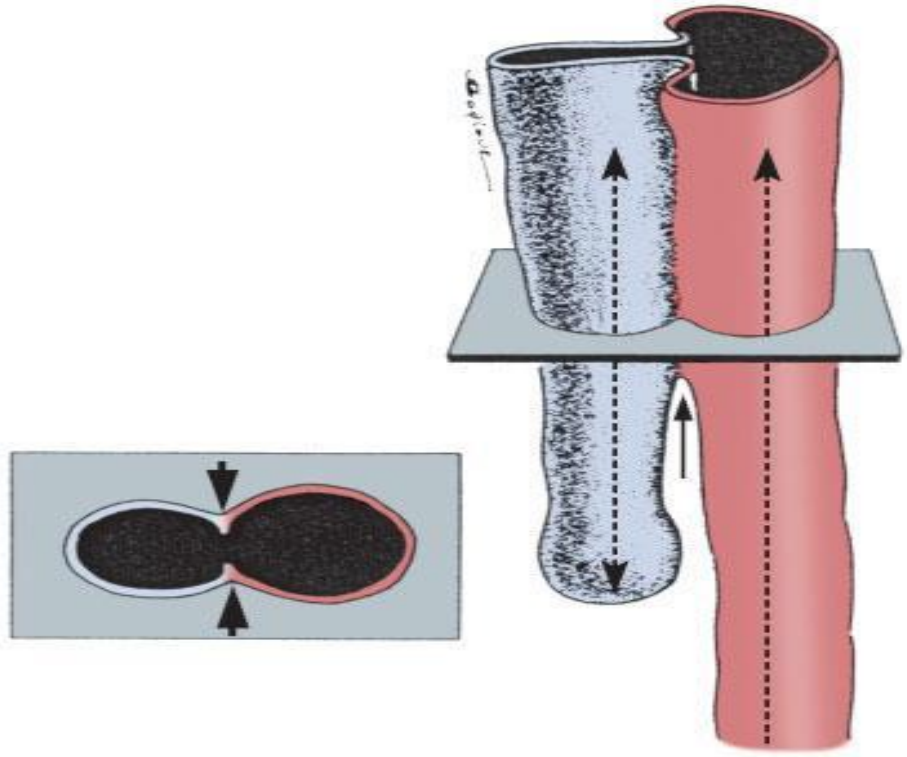

**Figure (1) Division of the foregut into trachea and oesphagus[3].**

## GENESIS OF THE LOBES

**It takes place as follows:**

- On the right
    1. The upper lateral bud produces lateral bronchus and upper lobe.
    2. The lower lateral bronchus produces the middle lobe.
    3. The stem (lowest) bud produces the lower bronchus and lower lobe.

- On the left
    1. The (single) lateral bronchus produces the upper left bronchus and upper lobe.
    2. The original left (stem)bronchus produces the lower left bronchus and lower lobe[3].

***Lobe segmentation continues until there are ten segments on the right and eight segments on the left.***[1]

At this time,three antenatal periods or phases of ramification of the pulmonary system commence sequentially.These are glandular or pseudoglandular,canalicular and alveolar.[4]

## Glandular or pseudoglandular phase

This phase starts at the end of the fifth week and perhaps ends around the sixteenth week.It was called glandular or pseudoglandular because clusters of solid epithelial cuboidal cells surrounding each infundibulum of the bronchial tree give the pulmonary parenchyma the histologic appearance of an exocrine gland.Gas exchange is not possible ;therefore , fetus born at this phase cannot survive.[4]

## Canalicular phase

This period starts around the $16^{th}$ week and ends around the $25^{th}$ week.The respiratory apparatus of the lungs is formed during this period by ramification of blood vessels around the infundibula as well as around the primordia of pulmonary alveoli.The pulmonary tissues become very vascular.Respiration at the $24^{th}$ to $25^{th}$ week is possible and fetus born at this phase may be able to survive.[4]

## Alveolar phase

This period extends from the $24^{th}$ to $26^{th}$ week till birth. At its commencement, alveolar formation overlaps the end of the previous phase. The epithelium of the alveoli becomes thin and flat. This phase is associated with a rich vascular proliferation of blood capillaries and lymph capillaries. These are the alveolar epithelial cells (type I pneumocytes ).They will later become secretory epithelial cells (type II pneumocytes)and produce surfactant. Surfactant lines terminal sacs in coatlike formation, lowering surface tension and preventing collapse of alveoli during expiration.[4]

The premature infant will survive only if adequate pulmonary vasculature and surfactant are present.A premature seven month fetus may survive because the respiratory system at this time has good function,lungs have some secretory function,and surfactant promotes maturity of the antenatal lungs.[2]

## Postnatal lung:

During first week,air inflates all alveoli.Blood and lymphatic capillaries absorb the fluid occupying 50% of the lung.From the 6th through the 8th week,there's rapid devlopment of alveoli.[1]

More alveoli are formed during the first postnatal years.The pulmonary alveoli of the newborn are said to be 20 million;the number in adults is approximately 300 million.[5]

***Congenital anomalies***

- Anomalies of lobulation.
- Bilateral agenesis of the lungs :fatal at birth.
- Unilateral agenesis and hypoplasia of the lungs:more in females and 50% die in the first 5 years of life.
- Congenital cysts of the respiratory tract:
  - Brochogenic cyst:compression of the trachea may be fatal.
  - Pulmonary cyst:eventually fatal if untreated.[6]

## THORACIC WALL

***The ribs*** (figure:2) arise from the small costal processes of the primitive thoracic vertebrae . In the fifth week, processes of the vertebrae in the thoracic region begin to elongate.The costovertebral joints form and the ribs from the vertebrae late in the sixth week . Initially , the future ribs are cartilaginous.Around the ninth week of embryonic life , ossification begins.The head and tubercle of each rib will host secondary centers of ossification . Complete bony formation is accomplished at 20 – 25 years of age.[2]