

Operative Technique

- Position the patient in left lateral position with a roll under the chest. Enter the chest through a standard posterolateral thoracotomy through the fifth space.
- Assess the disease extent and re-evaluate the decision for pneumonectomy.
- Retract the lung inferiorly and posteriorly; make a curved incision over the mediastinal pleura to reveal the right pulmonary artery. Incise the perivascular sheath to dissect in the perivascular plane.
- Continue the dissection distally to expose the superior division of the right pulmonary artery to the upper lobe and the continuation of the

right pulmonary artery (inferior division) into the fissure (Fig. 1). Ligate and divide the apical branch of pulmonary vein which may cross the artery at this point.

- Doubly ligate both these branches and then ligate the main right pulmonary artery with a thick silk suture. Divide the two branches between the ligatures.
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- Retract the lung posteriorly to expose the anterior hilar structures. Incise the mediastinal pleura longitudinally, parallel to the phrenic nerve; continue to the incision on the superior surface of the hilum.

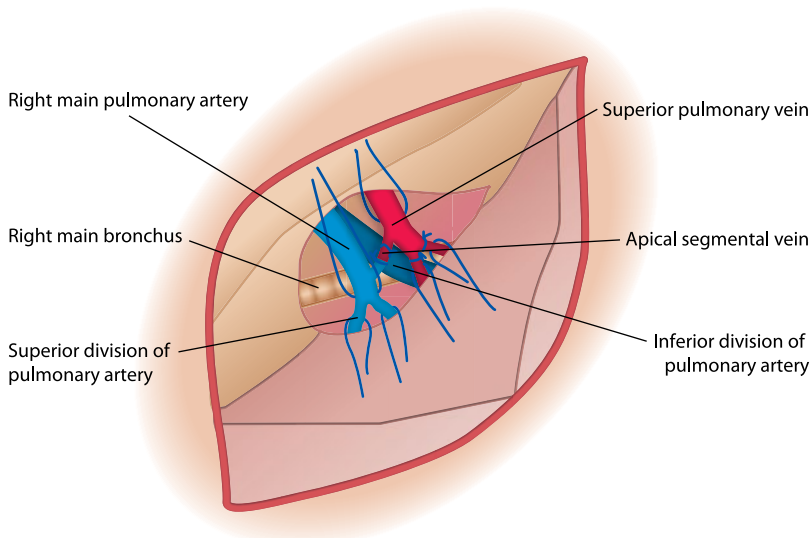
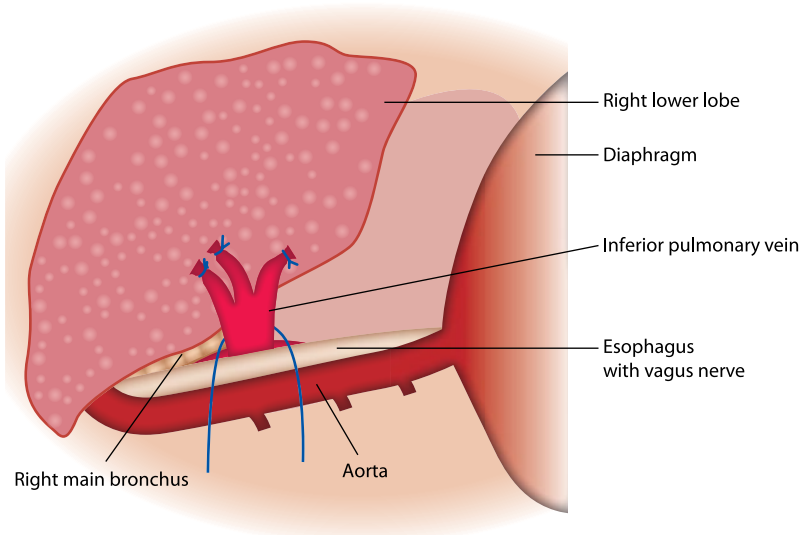


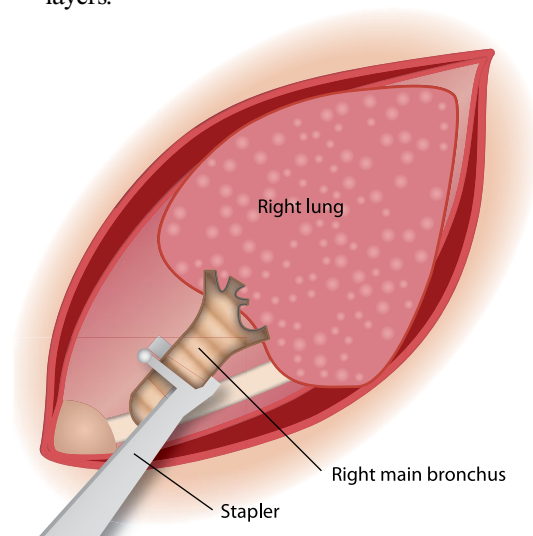
Fig. 1

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**Fig. 2**

- Reflect the pleura laterally to expose the superior pulmonary vein (Fig. 1). Dissect to enter the perivascular plane.
 - Delineate the main trunk and then continue dissection distally to expose the three branches of the superior pulmonary vein (Fig. 1).
 - Doubly ligate all these three branches and then ligate the trunk of the vein with a thick silk suture (Fig. 1).
 - Divide the three branches between the ligatures.
 - Retract the lower lobe of the lung anteriorly and superiorly to identify the inferior pulmonary ligament.
 - Divide the inferior pulmonary ligament from the diaphragm to the lower margin of the inferior pulmonary vein. Many small vessels in this ligament will need to be cauterized.
 - Dissect the inferior pulmonary vein as described for superior pulmonary vein. This also usually has three branches which can be dealt with as for the superior pulmonary vein (Fig 2).
 - Retract the lung anteriorly and elevate it from the mediastinum to identify the right main bronchus in the superior portion of the pulmonary hilum (Fig. 3).
 - Secure the two bronchial arteries on its surface and enter the peribronchial plane.
 - Apply a bronchial clamp on the bronchus, transect it with a knife and remove the specimen.
- Repair the transected bronchial end with interrupted Prolene sutures applied in a 'figure-8' manner.
- Alternatively, the bronchus may be secured by applying a stapling device (Fig. 3).
 - Check for the integrity of the bronchial closure by dipping the end into a pool of saline and asking the anaesthetist to apply positive pressure.
 - Ensure haemostasis, place an appropriately sized intercostal drain and close the chest in layers.

**Fig. 3**

Tips

- ▶ In cases of severe bronchiectasis with the lung and the thoracic cage severely collapsed, it is worthwhile opening the chest through the periosteal bed of the resected fifth rib.
- ▶ Pulmonary artery and veins have a very poorly developed media and hence need careful handling and ligation.
- ▶ The vascular ligatures can be done in many different ways and can also be done with vascular staplers. During ligation of the veins and the arteries, all the branches and the main trunk should be ligated separately and then the branches should be divided to prevent slipping of the ligature.
- ▶ The trunk of the inferior pulmonary vein is just anterior to the oesophagus which can be easily identified by a thick orogastric catheter placed in the oesophagus by the anaesthetist.
- ▶ The site of bronchial transaction should be as high as possible to avoid leaving too-long a bronchial stump which is prone to collection and repeated infections.
- ▶ The procedure is same for left pneumonectomy.

Common Pitfalls

- ▶ Injury to the stump of the superior pulmonary artery while dissecting the main bronchus as the artery is just on the anteromedially surface of the bronchus can occur.
- ▶ Leaving too-long a bronchial stump will lead to recurrent infections and may cause stump blow out and a bronchopleural fistula.