



Uniportal robotic-assisted thoracoscopic surgery right upper lobectomy for aspergilloma

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Clinical vignette

A 31-year-old male presented with recurrent hemoptysis and shortness of breath. The patient had a history of tuberculosis in their childhood for which he received six months of anti-tubercular treatment. A contrast-enhanced computed tomography (CECT) chest scan was done which illustrated an obliterated right upper lobe with a fungal focus. Bronchoscopy confirmed the hemoptysis from the right upper lobe without any signs of acute infection. A uniportal right upper lobectomy was planned with the Da Vinci Xi platform. The patient consented for the procedure.

Introduction

Surgical technique

The patient was intubated with a double lumen tube to achieve lung isolation. Two peripheral intravenous access sites were cannulated and an arterial line placed for intra-aortic balloon pump (IABP) monitoring. The patient was positioned in the left lateral decubitus position with a break in the drapes at the middle of chest.

Exposure

A 4 cm incision was placed in the 7th intercostal space between the mid and anterior axillary line. After entering the thoracic cavity and releasing adhesions under the incision, an extra small size wound protector was used without any rib spreading. The camera was docked at the

posterior most part of the incision with two working ports placed in the remaining space of the incision. Space was maintained between the arms by ensuring adequate patient clearance.

Intra operative techniques

Release of pleuro-pleural adhesions

Unlike patients with lung cancer, patients with aspergilloma have dense adhesions, especially in the apex. A robotic hook cautery was used in the right arm and a pair of fenestrated bipolar forceps was used in the left arm to dissect the adhesions. An important caveat is to take care around the subclavian and azygos veins as there is a risk of injury to these vessels. Some of the dissection is performed extra-pleural to avoid entering the fungal focus.

Hilar dissection

The apex of the lung is dissected first followed by dissection of the pulmonary hilum. Encircling the pulmonary hilar structures is difficult in aspergilloma patients, mainly owing to fused artery, bronchus and collateral connections. The arterial trunk to the upper lobe was dissected, looped and divided. The superior pulmonary vein was dissected first, and a vessel sealer was used to divide the vascular adhesions and also for posterior dissection of the vein. The pulmonary vein was encircled and divided using a robotic vascular stapler. The bronchus was dissected and divided with a black cartridge owing to the thickness and inflammation.

Fissure dissection

In procedures for aspergillomas, we most commonly use a fissureless technique where the dissection of the fissure is minimal to begin with and completed only at the end of the procedure. Once the hilar structures are divided, the posterior ascending artery was identified and stapled. The fissure is completed using serial staplers taking care to preserve the middle lobe vein and A6 branch.

Closure

Before closure, a complete mobilization of the lower and middle lobes is performed. The inferior pulmonary ligament is released. An intercostal block was performed with ropivacaine and dexmetomedine. The chest wound is closed in three layers after placing an intercostal drain.

Comments

Pulmonary aspergilloma is a type of fungal infection which develops by colonization of aspergillus in a pre-existing cavity (1). In the Indian subcontinent, it is mostly coexistent with tubercular cavity (2), and rarely found with other risk factors such as those with lung transplants or abscesses. Surgery remains the mainstay of treatment for aspergillomas, although it is considered complex owing to distorted anatomy, fused fissures, dense pleural adhesions, large collateral circulation and frozen hilum (3). Uniportal robotic lobectomy is the latest modality (4) which helps in overcoming major hurdles in aspergilloma surgery with 3D vision, more precision with movements and reliable staplers. The same incision is also helpful in retrieval of specimens and thus reduces post-operative pain leading to early recovery and reduced hospital stay.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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