Abstract No.: 1

Topic: Innovations in Surgery
Subtopic: Updates in surgical management

A Rare Case of Complicated Appendicitis

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Background: Acute appendicitis is one of the most common surgical presentations seen in the emergency department, usually presenting as a case of fever, anorexia, and abdominal pain. Curative treatment is an appendectomy with histological examination of the surgical specimen to diagnose the subtypes or causes of appendicitis. One of these subtypes, granulomatous appendicitis, is an uncommon form of appendicitis. This condition can be caused by a multitude of mechanisms, including tuberculosis infections, parasitic infections, fungal infections, mechanical obstruction, or systemic diseases such as Crohn’s disease, sarcoidosis, among others. Investigations and management should be tailored according to the histologic findings, and patient follow-up should be advised. Case summary: We present a case report of a young patient presenting with a typical picture of acute appendicitis. Following appendectomy, histopathology of the surgical specimen showed granulomatous features. We discuss pre-operative approach to appendicitis and post-operative approach based on atypical histological findings. Causes of granulomatous appendicitis and tailored investigations to help guide diagnosis are explored. Conclusion: Granulomatous appendicitis is an uncommon cause of acute appendicitis, but early recognition and detection of the pathology is crucial. Further investigations should be chosen based on associated signs and symptoms. Once etiology is confirmed, management should be initiated immediately, with the aim of preventing further progression and complications of the underlying disease.

Abstract No.: 2

Topic: Innovations in Surgery
Subtopic: Updates in surgical management

The Outcomes of Patients on Prolonged Mechanical Ventilation as a Bridge to Lung Transplant: A Case Series

Saleha Abdul Rab¹, Belal Nedal Sabbah¹, Ahmed Essam Maklad¹, Hiba Muhammad Raheel¹, Abdulrhman Jamal Eldeib¹, Tarek Ziad Arabi¹, Rayid Abdulwahab Abdulqawi², Mohamed Hussein Ahmed²

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Background: Mechanical ventilation (MV) is used in end-stage lung disease patients awaiting transplantation as a bridge to transplantation (BTT). Prolonged MV (PMV) is described as MV for 21 days or more. Historically, PMV was considered a poor prognostic factor, and patients placed on PMV were not eligible for lung transplantation (LTx). However, with recent advancements in both MV and patient care, patients who survive the early post-transplant period and receive MV as a BTT have a reduced risk of death. Objectives: We aim to determine whether pre-transplant PMV is associated with reduced post-transplant survival, and aid in the development of future guidelines regarding PMV. Methods: Patients included in this retrospective case series were required to be on MV for over 21 days as BTT. We studied the transplant- and PMV-related outcomes in three adults placed on PMV as BTT in King Faisal Specialist Hospital and Research Center. No IRB approval was required for this case series. Results: The mean age of the patients was 32 ± 7.8 years. Patients were listed for LTx or retransplant due to respiratory failure secondary to bronchiolitis obliterans syndrome with graft-versus-host disease post-allogenic stem cell transplant, idiopathic pulmonary hypertension (undergoing retransplant due to persistent alveolar infiltrates with ARDS symptoms), and chronic lung allograft dysfunction.
Abstract 2, Table 1. Summary of Cases

<table>
<thead>
<tr>
<th>LTx Date</th>
<th>Sex, Age at Transplant</th>
<th>Pre-Transplant Diagnosis</th>
<th>Days on MV Pre-LTx</th>
<th>Post-Transplant Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>Oct 1st, 2016</td>
<td>Male, 32 years BSO with GvHD post-allogenic SCT</td>
<td>86 days</td>
<td>32 days on MV post-LTx</td>
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<td>36 days ICU stay out of 55 days total spent in hospital post-LTx</td>
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<td></td>
<td>No history of acute or chronic rejection</td>
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<td>Patient developed DSA at 24 months post-LTx</td>
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<td></td>
<td></td>
<td></td>
<td>No acute renal failure or venous thromboembolism</td>
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<td></td>
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<td></td>
<td>Patient continues to live to this day</td>
</tr>
<tr>
<td></td>
<td>Feb 4th, 2019</td>
<td>Female, 22 years Idiopathic pulmonary hypertension, undergoing retransplant</td>
<td>117 days</td>
<td>24 days on MV post-retransplant</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>28 days ICU stay out of 51 days total spent in hospital post-retransplant</td>
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<td>No history of acute or chronic rejection</td>
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<td>No acute renal failure or venous thromboembolism</td>
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<td>Patient continues to live to this day</td>
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<tr>
<td></td>
<td>April 4th, 2019</td>
<td>Female, 41 years Chronic lung allograft dysfunction after a prior LTx, undergoing retransplant</td>
<td>38 days</td>
<td>11 days on MV post-retransplant</td>
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<tr>
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<td></td>
<td>12 days ICU stay out of 24 days total spent in hospital post-retransplant</td>
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<td>Grade A2 acute cellular rejection three years after first LTx</td>
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<td></td>
<td>Chronic lung allograft dysfunction four years after first LTx</td>
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<td></td>
<td>Patient developed DSA at 20 months after retransplant</td>
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<td></td>
<td></td>
<td>Tracheostomy site still not closed 2.5 years post-retransplant</td>
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<td></td>
<td></td>
<td>No acute renal failure or venous thromboembolism</td>
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<td>Patient continues to live to this day</td>
</tr>
</tbody>
</table>

Management of Symptomatic Anomalous Left Main Coronary Artery Arising from the Right Sinus of Valsalva

The origin of the left coronary artery from the right sinus of Valsalva is a rare congenital coronary anomaly. Although uncommon, this anomaly is often classified as a serious anomaly due to the high risk of sudden cardiac death. Therefore, surgical intervention is recommended for all patients with left main coronary artery from right sinus of Valsalva regardless of the symptoms. Surgical approach includes unroofing, re-implantation, and bypass graft. Each of the surgeries is done according to the case. We present a case of a 46-year-old Jordanian female who presented with exertional dyspnea for more than 2 years and history of recurrent syncope in the last 6 months. Cardiac catheterization revealed that the left main coronary arises from the right sinus of Valsalva and passes between the left ventricular outflow tract and pulmonary trunk, and then between the left ventricular outflow tract and the left atrium. Furthermore, MIBI pharmacological (adenosine) stress and rest cardiac perfusion scan (SPECT) was done revealing reduced myocardial perfusion in the anterior wall of the left ventricle. The patient was very symptomatic upon

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1Alfaisal University, Saudi Arabia; 2King Hussein Medical Center, Jordan
admission and the decision was either bypass surgery to the left anterior descending artery and circumflex or re-implantation of the left main artery. Complete transection of the aorta to have a full view was done and left main transfer procedure was carried out to move the stem from the right coronary sinus into a newly created ostium at the left coronary. Post-operation, the patient was stable during her 7-day hospital stay. However, because a major complication of this procedure is either kinking or stenosis which may be fatal, a coronary CT angiography was performed which showed the left main coronary arising from the left coronary cusp with no significant stenosis. Reimplantation is a technique indicated for all extramural anomalies of the coronary arteries. Furthermore, it is a straightforward procedure that restores normal anatomic and physiologic function with excellent prognosis and low operative morbidity.

**Abstract No.: 4**

**Topic: Innovations in Surgery**  
**Subtopic: Robotics and 3D printing**

**Perimammary Robotic Bi-Portal 3-Arms Left Bronchoplastic Upper Lobectomy**

Lama Tariq Saif¹, Hamsa Aldebakey¹, Ibrahem Albalkhi¹, Abdullah Alshammari², Norberto Santana Rodriguez³

¹College of Medicine, Alfaisal University, Saudi Arabia; ²Royal Brompton Hospital, London, UK; ³SSMC-Mayo Clinic, United Arab Emirates

**Background:** The growth of robotic-assisted thoracic surgery (RATS) has been witnessed in the past two decades with new challenges being addressed to improve the technique. The usual performance of RATS (through 4-5 trocars) might cause more post-operative pain, less satisfying cosmetic results, and more intraoperative difficulties than uniportal video-assisted thoracic surgery (UVATS). Our paper describes the first case of a perimammary biportal RATS for a complex bronchoplastic left upper lobectomy. The goal was to have a better exposure of the left hilum, facilitate the surgeon’s assistance and the bronchial anastomosis, shorten the hospital’s length of stay, and achieve less post-operative pain, and better cosmetic results. **Case Summary:** A 27-year-old female patient with a carcinoid tumor in the left upper lobe extending to the main bronchus underwent robotic surgery (Da Vinci Xi system) in 2019. A 5cm left perimammary incision was made to approach the pleural cavity on the 5th intercostal space. A wound retractor was placed and a 12mm trocar (arm 1) was placed on the anterior border along with an 8mm camera (arm 2) on the posterior edge of the utility incision. One additional 12mm trocar was placed posteriorly (arm 3). The exposure of the left hilum and the airway through the 5th intercostal space was excellent due to the anterior approach given by the perimammary utility incision. It facilitated the dissection and division of both vessels and the left upper bronchus at the level of the secondary carina. The surgical procedure took 195 minutes, and the estimated blood loss was 10 milliliters. The average communicative pain was 1 at admission, 3 at one week, and 0 at one month post-operatively. The postoperative outcome was smooth, and the patient was discharged on the second postoperative day without complications. R0 resection was achieved, and pathology revealed the presence of a 2.5x1.8 cm typical carcinoid tumor without lymph node involvement. Cosmetic results and patient satisfaction were excellent. A chest CT at a 3-year follow-up post-operation showed no signs of recurrence. **Conclusion:** The perimammary RATS approach allowed us to carry out a bi-portal complicated robotic lobectomy using three arms with excellent exposure and assistance. Excellent post-operative outcomes and good cosmetic results were observed. Further studies will clarify whether this new approach could be extended to other surgical indications.

**Abstract No.: 5**

**Topic: Innovations in Surgery**  
**Subtopic: Updates in surgical management**

**Collision Tumor of Chordoma and Meningioma in the Petroclival Region. Video Case-Based Report and Literature Review**

Nour Basem Odeh¹, Luisa Fernanda Figueredo², Joao Paulo Almeida³, Alfredo Quinones Hinojosa³

¹College of Medicine, Alfaisal University, Saudi Arabia; ²Mayo Clinic FL, Colombia; ³Mayo Clinic FL, Brazil; ⁴Mayo Clinic FL, Mexico

**Background:** Collision tumors are rare entities, more frequently reported as meningiomas colliding with glomus, pituitary adenomas, craniopharyngiomas, and schwannomas. Here we present the second case of a petroclival meningioma colliding with a chordoma. **Case Summary:** In this report, the authors describe a patient with a petroclival collision tumor. A meningioma and chordoma. To the authors’ knowledge, there is only one previous case of a collision tumor involving these two entities. **Conclusion:** Clinicians should consider the possibility of a collision tumor in patients who present with a rapid onset of symptoms and abnormal growth patterns expected from an initial histopathological examination. A preoperative distinction is challenging when tumors are similar in radiographic characteristics and location. Mainly, petroclival location makes gross total resection a limited option, opening other co-adjuvant therapies, including radiotherapy and proton beam therapy, which also differ depending on the
histopathological diagnosis. Resection of such tumors can be tricky; hence the introduction of virtual reality and other novel pre and post operative tools should be considered. A multidisciplinary team must be involved. Finally, future research on the tumor microenvironment may identify underlying changes or genetic links between chordomas and meningiomas in the petroclival region.

Abstract No.: 6
Topic: Interventional Medicine (Non-Surgical)
Subtopic: Interventional Endoscopy

Endoscopy Innovations- A Journey to Replace Gastrointestinal Surgery
Abdul Monem Swied 1
1 SIU School of Medicine, IL, USA

It was Philip Bozzini who in 1805 made the first attempt to observe the living human body directly through a tube he created known as a Lichtleiter (light guiding instrument) to examine the urinary tract, rectum and pharynx. Through many phases over the last and this century, endoscopy came along to the prototypes which we have now to deliver the most complex diagnostic and therapeutic endoscopic procedures. Surgery has been the curative modality and only therapy for many years, but over the last decade endoscopy has taken a major turn in replacing and helping in many surgical procedures toward the endoscopy territory for many reasons including easier access, cost, outcomes, morbidity etc. Our presentation will discuss areas of the Gastrointestinal tract disorders, where endoscopy has made a tremendous change in patient care being adjunctive or completely replacing surgery in different anatomic locations in upper and lower GI tracts, biliary-pancreatic and beyond the lumen. We will be discussing state of the art procedures in areas of EUS, 3rd space endoscopy, ERCP, AI and others in making our point of the present title. Examples of such interventions include EDGE (EUS Directed Trans-gastric ERCP), choledochotomy, tumor ablations, POEM, and others.

Abstract No.: 7
Topic: Interventional Medicine (Non-Surgical)
Subtopic: Interventional Cardiology

Cardioembolic Events in Patients with Woven Coronary Artery Anomaly
Noorah Mosharraf 1, Maisha Maymona 1, Khulood Alhasan 2, Bushra Odeh 3, Fahad Alqahtani 4
1 Alfaisal University, Bangladesh; 2 Alfaisal University, Saudi Arabia; 3 Alfaisal University, Jordan; 4 King Fahad Medical City, Saudi Arabia

Background: Woven coronary artery anomaly (WCAA) is a rare and underdiagnosed anomaly that is characterized by the division of epicardial coronary arteries into multiple thin channels that converge distally to form a single lumen. This phenomenon can occur anywhere along the vessel and can affect a single or multiple coronary vessels. In this report, we describe a case of a 40-year-old male who presented with a history of multiple transient ischemic attacks (TIA) and upon investigation, he was incidentally found to have a woven right coronary artery with regional wall motion abnormalities and left ventricular thrombus formation.

Case Presentation: Our case is of a 40-year-old Saudi male known to have asthma, hypothyroidism, and multiple episodes of TIA and moderate-size LV thrombus that was diagnosed by echocardiography who was referred for elective cardiac catheterization. He presented with sudden onset right sided weakness in both upper and lower limbs, loss of sensation on the right side and absence of right visual field; he had had four similar events previously. On presentation, the patient had a blood pressure of 178/140, all other tests were unremarkable. Patient was put on anticoagulation for 3 months and had regular follow ups with stroke clinic. He was electively admitted for catheterization and that showed query woven arteries. He was discharged on warfarin, aspirin, bisoprolol, lisinopril, levothyroxine, and omeprazole.

Conclusion: WCAA is often considered a benign variant because of its normal blood flow. The lumen diameters of the true WCA between different tunnels are narrowed. If misdiagnosed as thrombus recanalization, a large coronary stent may be used, leading to vascular rupture. Therefore, clinical follow-up is recommended for WCAA even if there is no flow restriction. IVUS and OCT can be used to make a definite diagnosis and reduce unnecessary intervention. FFR (i.e., fractional flow reserve) has been found to be a better method than coronary angiography in assessing the risk of ischemia. If stenosis or thrombosis are seen, coronary artery bypass grafting combined with medications may be safer than stent implantation based on intravascular imaging. It is not known whether antiplatelets and statins are effective in this case. Although WCAA appears to be benign without any major adverse cardiovascular events, more data and in-depth research are needed to understand this sporadic disease.

Abstract No.: 8
Topic: Interventional Medicine (Non-Surgical)
Subtopic: Interventional Cardiology

A Novel Interventional Treatment in Mitral Regurgitation: Transcatheter Mitral Valve Replacement in a Challenging Case
Domenico Galzerano 1, Bandar Alamro 1, Olga Vriz 1, Ali Alenazy 1, Ahmed Alshehri 1,
Mohammed Al Amri¹, Ali Alsanei¹, Ahmad Alhamshari², Hani Al Sergani¹
¹King Faisal Specialist Hospital & Research Center, Saudi Arabia; ²College of Medicine, Alfaisal University, Saudi Arabia

In the wide horizon of mitral regurgitation (MR) treatment, transcatheter procedures have emerged as an alternative option to treat inoperable and high-risk surgical patients. The transcatheter edge-to-edge mitral leaflet repair (TEER) is the most frequently applied interventional procedure in mitral valve (MV) therapeutic strategy, however, some anatomic substrates are not suitable (e.g., cleft or perforation, previous mitral valve repair, leaflet thickening and calcification in particular in the grasping areas, short posterior mitral leaflet with limited motion and rheumatic heart disease). Also, the repair is not always able to both fully correct the severity of the regurgitation and prevent MR progression overtime. Transcatheter native mitral valve replacement (TMVR) is a novel procedure that has the potential to overcome some of the current limitations associated with TEER. We describe a challenging, inoperable and high-risk surgical clinical case where TEER was not feasible due to the anatomical pattern. A 65 years old female with medical history of hypothyroidism, morbid obesity, two previous aortic valve replacements (for severe aortic regurgitation and redo for para-valvular leak and aortic root abscess), aortic root replacement and coronary artery bypass graft was admitted for acute decompensated heart failure. Transthoracic echocardiography and transesophageal echocardiography (TEE) showed rheumatic mitral valve with severe regurgitation and moderate stenosis and mildly reduced systolic ventricular function. Coronary angiography showed occluded left main coronary artery and occluded saphenous vein graft. The pathomorphology of the mitral valve was not suitable for TEER. Therefore, combined multidisciplinary team meeting found TMVR to be the best choice to treat this patient. The peculiar imaging work-up by TEE and cardiac CT found the procedure feasible. So, patient underwent an imaging guided TMVR with the Tendyne system (figure). There were no procedural complications and optimal prosthesis functioning with trace residual MR. In conclusion, TMVR is a novel procedure that has emerged in the wide horizon of therapeutic strategy in MR as a missing link in inoperable patients who are not suitable for TEER. TMVR role in the decision making is expanding in clinical arena.

Abstract No.: 9
Topic: Innovations in Surgery
Subtopic: Updates in surgical management

Management of Rib Avascular Necrosis: A Rare Case Report
Ibrahim Albalkhi¹, Tariq Saleh¹, Jibran Ibrar², Waleed Saleh²
¹Alfaisal University, Saudi Arabia; ²King Faisal Specialist Hospital and Research Centre (KFSH&RC), Saudi Arabia

Background: Avascular Necrosis of the rib is a rare presentation of Sickle Cell Anemia’s vaso-occlusive crisis. Case summary: This report describes the case of a 45-year-old male known to have Sickle Cell Anemia presenting with rib avascular necrosis complicated by osteomyelitis. The patient came to the outpatient department with left lateral chest wall pain. Antibiotics...
showed no improvement. CT scan of the chest revealed a left 6th rib fracture with the thick fluid collection, consistent with pus. The patient was taken to surgery where he underwent necrotic bone debridement and pus drainage. The patient showed improvement and became afebrile after the surgery. **Conclusion:** The lack of distinct clinical indicators and low occurrence of rib avascular necrosis can lead to the misdiagnosis and mismanagement of the disease.

**Abstract No.: 10**

**Topic:** Innovations in Surgery

**Subtopic:** Updates in surgical management

**Unusual Presentation of an Aneurysmal Bone Cyst in a 51-Year-Old Female**

**Jibran Ibrar¹, Tariq Saleh¹, Areez Shafqat¹, Ibrahem Albalkhi¹, Waleed Saleh²**

¹Alfaisal University, Saudi Arabia; ²King Faisal Specialist Hospital and Research Centre (KFSH&RC), Saudi Arabia

**Background:** Aneurysmal bone cysts (ABC) are non-neoplastic primary bone tumors, typically involving the long bones and vertebrae in the first two decades of life. ABCs require prompt diagnosis and intervention due to their rapidly expansile nature and ability to destroy the adjacent normal bone. ABCs rarely affect the rib. **Case summary:** We report a case of a 51-year-old female presenting with chronic dry cough and right upper back pain. A chest X-ray and computed tomography scan revealed an expansile, lytic mass affecting the posterior aspect of the third right rib. The third right rib was resected using a posterolateral, Shaw-Paulson approach. Histopathology of the resected mass confirmed the diagnosis of ABC. There were no intra- or perioperative complications, and follow-up X-ray was normal. **Conclusion:** Aneurysmal bone cysts (ABC) are non-neoplastic primary bone tumors that rarely involve the ribs. Less invasive management options for aneurysmal bone cysts have been added to the literature. Surgical excision, however, remains the treatment modality of choice for ABCs.

**Abstract No.: 11**

**Topic:** Innovations in Surgery

**Subtopic:** Minimally invasive surgery

**Uniportal VATS Chest Wall Tumor Resection: Extending the Boundaries of the Minimally Invasive Thoracic Surgery**

**Ahmed Saud Alahmari¹, Juman Haar², Hamsa Aldebakey², Ibrahem Albalkhi², Abdullah Alshammari³, Norberto Santana Rodriguez⁴**

¹Pediatric Surgery, Security Forces Hospital, Saudi Arabia; ²College of Medicine, Alfaisal University, Saudi Arabia; ³Royal Brompton Hospital, London, UK; ⁴SSMC - Mayo Clinic, United Arab Emirates

**Background:** Minimally invasive video-assisted thoracic surgery (VATS) has evolved from being done in simple cases to performing complicated surgeries that were only carried on by thoracotomy. Nevertheless, chest wall tumor resection is still challenging to perform by VATS, especially if there were multiple ribs involved. Only a few uniportal single rib resection cases are reported in the literature. In our institutes, we were able to achieve a complete resection of a chest wall mass that involved two ribs. Our goal is to assess the feasibility of uniportal VATS chest wall tumor resection for multiple ribs and assess the post-operative outcomes.
including hospital lengths of stay, complications, and recurrence. **Case Summary:** The patient is a 68 years-old male who was diagnosed with retroperitoneal multiple liposarcomas that were resected. Later, he had a recurrence and developed a right chest wall mass with the involvement of the adjacent rib. Surgical removal was discussed with the patient, and he consented to undergo uniportal right VATS chest wall mass resection. At a lateral position with the patient’s right side up, a 3cm utility incision was done over the fifth intercostal space to enter the thoracic cavity. There was a protruding mass in the posterior wall of the thoracic cavity between the seventh and eighth rib. Scanlan rib cutter was used for the segmental resection of the seventh and eighth rib. Next, en-bloc resection of the mass was performed by releasing it from the adjacent tissue using electrocautery and a harmonic device. After the complete release of the two rib segments with the involved chest wall tissue, the specimen was placed in an Endo Bag and taken out through the port incision. A paravertebral catheter was inserted, and the lung inflated without signs of air leak. The patient was discharged on the third post-operative day. He has been following up as an outpatient after that. He reported mild post-operative pain with no other complications. The pain was controlled with pain medications. The wound is healing well without complications. The Chest x-ray was unremarkable. The pathohistological study reported a complete resection of the tumor with free margins. **Conclusion:** Video-assisted thoracoscopic surgery can be used to perform chest wall tumor resections and achieve positive outcomes. More practice is encouraged to assess different cases and develop the technique.