

Thoracic Surgery; Important Considerations and Practical Steps



D. Michael Tillson, DVM, MS

KEYWORDS

- Thoracic surgery • Thoracotomy • Sternotomy • Transdiaphragmatic thoracotomy
- Thoracostomy tube • Thoracic anatomy

KEY POINTS

- Outcomes associated with thoracic surgery are related more to the underlying disease process than the surgical approach.
- Straightforward surgical procedures including vascular surgeries have excellent outcomes, whereas more complex procedures tend to have less positive outcomes.
- Investment in facilities and equipment is needed to properly perform thoracic surgery. Reluctance to make this investment seemingly reduces the effectiveness of the surgeon and decreases the likelihood of a successful outcome.

Surgical skills required for performing a thoracotomy are not particularly different than those used for other surgeries, although there are some specific skills to be considered. Challenges of performing a thoracotomy include a lack of familiarity with procedures, concerns about perioperative and anesthesia management, need for 24-hour monitoring after surgery and decision-making steps required for a successful procedure and outcome.

Performing successful thoracic surgery is feasible for an experienced general surgeon in a well-equipped practice. This article reviews the basics of getting into and out of the thoracic cavity using standard open surgical approaches. Additionally, a template is offered to help decide whether thoracic surgical procedures are appropriate for your practice.

GENERAL OVERVIEW

This article reviews techniques and tips found useful by the author when performing thoracic surgery.

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Department of Clinical Sciences, Bailey Small Animal Teaching Hospital, College of Veterinary Medicine, Auburn University, 1220 Wire Road, Auburn, AL 36849, USA

E-mail address: tillsdm@auburn.edu

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Veterinary articles, in an attempt maximize sample sizes, often look at every thoracic surgery performed at a particular location by numerous individuals at various levels of training,^{1–4} whereas a retrospective human study will be able to describe 600 children undergoing median sternotomy for a few, specific cardiac procedures.⁵ Such veterinary studies, although often the best available, introduce several variables requiring the reader to be more discerning in their take-home message. Below are some important retrospective reviews of veterinary thoracic surgery and some of the key findings. Readers are encouraged to review the articles for additional insights.

- A review of more than 180 thoracotomies in dogs and cats showed a 78% overall survival rate.¹
 - The most common thoracic procedures in this study were patent ductus arteriosus (PDA) ligation, diaphragmatic hernia (DH) repair and esophageal foreign body retrieval in dogs, and DH repair and thoracic exploratory surgeries for cats with pleural effusions.
 - Mortality rates after thoracotomy were found to be variable with those having a high survival rate (>90%; eg, PDA, thoracic wall trauma, congenital DH), intermediate survival rate (60%–75%; eg, persistent right aortic arch (PRAA), pulmonic stenosis, pleural effusions), and lower survival rates (<60%; eg, cardiac, pericardial, and esophageal surgeries).
 - The lowest survival rates were reported for procedures involving the great vessels and pulmonary or mediastinal tumors.
- A review reported on lateral thoracotomy in 83 small animals.² They found survival outcomes were significantly lower in cats compared with dogs (62% vs 91%) and in animals with neoplastic disease versus those with nonneoplastic conditions (60% vs 93%).
 - The underlying reasons for most lateral thoracotomy procedures were vascular procedures (ie, PDA, PRAA), and these procedures had the highest survival to discharge rates. Small animals undergoing esophageal and lobectomy procedures had lower but similar survival rates.
 - Complications associated with lateral thoracotomy included seroma and ventral edema [16/83], excessive wound inflammation [6/83], ipsilateral limb lameness [3/83], and wound discharge [3/83].
- A recent study evaluating 232 patients after thoracic surgery found that nearly 7% had pyothorax after a thoracotomy (lateral or median sternotomy).³
 - Risk factors identified included surgery for idiopathic chylous effusions and invasive, presurgical interventions for diagnostic, management, or therapeutic reasons, such as thoracocentesis or intrathoracic biopsy.
 - In dogs with pyothorax, diagnosis was confirmed an average of 7 days after surgery, and the ultimate mortality rate was 67%. Dogs with the diagnosis of chylous effusion accounted for 60% of dogs that had postoperative pyothorax.
 - The breakdown of procedures showed the most common approach was a lateral thoracotomy (67%) with median sternotomy being performed in 27% of patients. Other approaches were thoracoscopy (3%), transdiaphragmatic sternotomy (2%), or a combined transdiaphragmatic and median sternotomy (1%).
- A review of 286 dogs undergoing thoracotomy looked at factors associated with nonsurvival at 24 hours and before discharge.⁴
 - The use of neuromuscular blocking agents and the need for presurgical oxygen supplementation were risk factors for nonsurvival at 24 hours.

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