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HOW DO I TREAT THYMOMA IN CATS? A NEW APPROACH

Manuel Jiménez Peláez LV, MRCVS, Dipl. ECVS
European and RCVS Recognised Specialist in Small Animal Surgery
Head of Surgery, Co-director and Founding Partner
Aúna Veterinary Specialities IVC Evidensia – Valencia (Spain)
E-mail:dr_jimenez_pelaez@hotmail.com ; Instagram: @manu.jimenez.pelaez

INTRODUCTION

This text describes a new thoracoscopy-assisted transdiaphragmatic approach via a cranial mini-laparotomy to treat thymomas in cats, with the aim of avoiding sternotomy. This technique (for the treatment of thymomas and pyothorax in cats) was accepted for presentation at the 2024 Veterinary Endoscopy Society Annual Meeting, 30 July–1 August, Santa Barbara, California, USA.

The presentation was entitled:
"New Transdiaphragmatic Thoracoscopic-Assisted Approach (via mini-midline laparotomy) in 6 Cats to Treat Cranial Mediastinal Masses (3 cases) and Pyothorax (3 cases)".
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Median sternotomy is considered the standard approach described for accessing the thorax and performing the removal of cranial mediastinal masses (thymoma is the most common indication) and for the treatment of bilateral pyothorax in cats, among other procedures.

This technique allows bilateral visualisation of the thoracic cavity through a single approach. However, it is less commonly used due to the high rate of complications observed (between 17% and 78%) compared to the intercostal thoracic approach.

The morbidity and complications associated with median sternotomy, especially when not performed exactly in the centre of the sternum, include pain, sternal fractures, dehiscence, seromas, suture/cerclage failure, sternal necrosis, etc.

Compared to conventional techniques, the transdiaphragmatic (TD) approach, first described by Fingeroth and Birchard, is associated with lower morbidity and better exposure of the caudal thorax, but it had not previously been reported for approaching the cranial mediastinum.

This approach has been described for performing cardiopulmonary resuscitation in canine cadavers, pacemaker implantation in small animals, pericardiectomies, attenuation of porto-acetic shunts, ductus arteriosus ligation, foreign body removal, caudal pulmonary lobectomies, and caudal oesophagotomy, among others, but its use for the treatment of cranial mediastinal masses or pyothorax had not been described.

The ventral approach to the midline abdomen is less complex, less demanding, and much more frequently used by surgeons.

MATERIALS AND METHODS

The objective of this case series is to describe the use of a thoracoscopy-assisted transdiaphragmatic approach (TTAA) through a cranial midline mini-laparotomy to remove cranial mediastinal masses and treat pyothorax in cats, as well as to report its complications and results.

A ventral cranial mini-laparotomy (xiphoumbilical) was performed and the falciform ligament was completely removed with bipolar forceps. Next, the diaphragm was incised circumferentially with a scalpel blade (leaving 0.5-1 cm of diaphragm on the sternal side to be sutured at the end of the procedure) in its ventral and central portion (about 4-5 cm as needed), and an atraumatic circular retractor (SurgiSleeve©) was placed between the skin and the interior (thoracic) of the diaphragm, thus achieving a direct transdiaphragmatic thoracic approach.

The surgery began with exploration of the thoracic cavity, assisted by thoracoscopy, through this approach, observing the mass in the cranial mediastinum and assessing its relationship and invasion, if any, with the adjacent tissues. If the thymoma is invasive or visibility/approach is insufficient, conversion to median sternotomy is recommended. The use of two manual Farabeuf retractors, held by one of the assistants, pulling up the costal arch on both sides of the xiphoid process, is very helpful in creating working space.

All surgeries were performed through this single port, using a combination of laparoscopic instruments (30° angled optics, forceps, etc.) and long open thoracic surgery instruments. The mass was dissected using a 5 mm diameter, 23 cm long Ligasure® vascular sealing device and bipolar scalpel forceps, visualising and preserving both phrenic nerves and large vessels at all times.

Pyothorax was treated using the same approach, performing the necessary procedures in each case: mediastinal necrosectomy, pulmonary lobectomies, resection of abscesses/granulomas, etc.

After confirming the absence of bleeding, the thoracic cavity was washed, a transdiaphragmatic chest drain was placed through the abdominal wall (to limit intercostal morbidity), and the diaphragm was reconstructed with a simple continuous suture pattern. The procedure was completed with routine three-layer closure of the laparotomy.

RESULTS

Six cats were included in this study, with a cranial mediastinal mass (3 cases) or bilateral pyothorax (3 cases). Three thymomas and 3 pyothoraxes were diagnosed based on cytology.

Computed tomography of 3 cats with a cranial mediastinal mass revealed well-circumscribed, non-invasive cranial mediastinal masses measuring (LxWxH) 5 cm x 3 cm x 2.6 cm; 3.4 cm x 2.6 cm x 1.6 cm, and 5.5 cm x 3.2 cm x 3.4 cm (cases 1, 2, and 3, respectively).

Bilateral thoracic fluid, thickening of the ventral mediastinum, collapsed lung lobes, and fluid-filled cavities were observed on CT scans of three cats with pyothorax.

The TTAA consisted of a midline cranial laparotomy and a ventral diaphragmatic opening. All three thymomas were successfully and completely removed using a 5 mm, 30-degree endoscope, standard laparoscopic instruments, and a vascular sealing device.

In all three cats with pyothorax, all affected thoracic tissues were removed with the same equipment (mediastinectomy, pulmonary lobectomies, subtotal excision of granulomatous lesions in the cranial mediastinum, and abscesses in the caudal mediastinum) and thorough thoracic lavage was performed.

In all cases, a transdiaphragmatic chest drain was placed. The diaphragm was sutured with 3/0 USP polydioxanone using a simple continuous pattern, and the laparotomy was routinely closed.

No intraoperative or postoperative complications were recorded, nor were there any recurrences during the 6-month follow-up period.

The surgical time ranged from 40 to 60 minutes.

Patients recovered without complications after surgery.

Timoma cases were discharged 24 hours after surgery and pyothorax cases were discharged 48 hours after surgery.

Reassessment and chest X-rays at 2, 4, and 6 months postoperatively revealed no signs of recurrence, and patients remained asymptomatic.

CONCLUSIONS

TTAA via cranial midline mini-laparotomy provides sufficient exposure to remove cranial mediastinal masses and to surgically treat pyothorax in cats. It is a quick technique with low morbidity, which in certain cases can replace median sternotomy with laparotomy, which should be associated with lower morbidity and fewer complications.

Since this study was presented, more patients have been treated, including small dogs with large thymomas, cases that were certainly not candidates for total thoracoscopic resection but would have been treated by median sternotomy had it not been for this new alternative.

BIBLIOGRAPHICAL REFERENCES

1. Jiménez Peláez M, Aguilar García D. New Transdiaphragmatic Thoracoscopic-Assisted Approach (Via Midline Laparotomy) in 6 Cats to Treat Cranial Mediastinal Masses (3 cases) and Pyothorax (3 cases). Scientific Presentation Abstracts: 2024 VES Annual Conference July 29-August, Santa Barbara, California. Vet Surg 2024;53:O7–O8.

2. Bleakley S, Phipps K, Petrovsky B, Monnet E. Median sternotomy versus intercostal thoracotomy for lung lobectomy: a comparison of short-term outcome in 134 dogs. Vet Surg. 2018;47(1):104–13.

3. Monnet EL. Lungs. In: Johnston SA, Tobias KM, editors. Veterinary surgery: small animal. 2nd ed. St. Louis, MI: Elsevier; 2018. p. 1983–99.

4. Fingeroth JM, Birchard SJ. Transdiaphragmatic approach for permanent cardiac pacemaker implantation in dogs. Vet Surg. 1986;15(4):329–33.

5. De Ridder M, Kitshoff A, Devriendt N, Or M, Rubio-Guzman A, de Rooster H. Transdiaphragmatic pericardiectomy in dogs. Vet Rec. 2017;180(4):95.

6. Jack MW, Wierenga JR, Bridges JP, Baltzer WI, Crosse KR. Feasibility of open-chest cardiopulmonary resuscitation through a transdiaphragmatic approach in dogs. Vet Surg. 2019;48(6):1042–49.

7. Fox PR, Mattiesen DT, Purse D, Brown NO. Ventral abdominal, transdiaphragmatic approach for implantation of cardiac pacemakers in the dog. J Am Vet Med Assoc. 1986;189(10):1303–8.

8. Visser LC, Keene BW, Mathews KG, Browne WJ, Chanoit G. Outcomes and complications associated with epicardial pacemakers in 28 dogs and 5 cats. Vet Surg. 2013;42(5):544–50.

9. Or M, Kitshoff A, Devriendt N, De Ridder M, Quist-Rybachuk G, de Rooster H. Transdiaphragmatic approach to attenuate porto-azygos shunts inserting in the thorax. Vet Surg. 2016;45(8):1013–18.

10. Staiger BA, Vet M, Stanley BJ, Acvs D. Single paracostal approach to thoracic duct and cisterna chyli: experimental study and case series. Vet Surg. 2011;40:786–94.

11. Garcia-Pertierra S, Das S, Burton C, Barnes D, Murgia D, Anderson D, et al. Surgical management of intrathoracic wooden skewers migrating from the stomach and duodenum in dogs: 11 cases (2014–2020). J Small Anim Pract. 2022;63(5):403–11.

12. Rico-Holgado S, Fontalba-Navas J, Fabregas-Mena M, Matres-Lorenzo L, Calvo I, Rodriguez-Quiros J. Feasibility of lung lobectomy through a transdiaphragmatic approach in dogs. Vet Rec. 2024;e4394