ORIGINAL ARTICLE

# Accessory lung lobectomy in dogs: 11 cases (2009-2023)

N. Cremaschini*, B. Hertel*, A. Singh†, A. Aertsens‡ and F. Cinti *,1

*San Marco Veterinary Clinic and Laboratory, Veggiano, Italy
†Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada
‡College of Veterinary Medicine, University of Minnesota, Saint Paul, Minnesota, USA

[1]Corresponding author email: filippocinti@icloud.com, filippocinti@libero.it

**Objectives:** To describe accessory lung lobectomy, via right or left intercostal thoracotomy, intraoperative and postoperative complications and outcome in a small population of dogs.

**Materials and Methods:** The medical records of 11 dogs that underwent accessory lung lobectomy at three veterinary institutions between 2009 and 2023 were reviewed. Signalment, history, physical examination, diagnostics, duration of hospitalisation, surgical approach, type of lobectomy, concurrent procedures, intraoperative and postoperative complications, duration of indwelling thoracic drain and short-term outcomes were recorded.

**Results:** Dogs underwent accessory lung lobectomy either via right ($n=9$) or left ($n=2$) intercostal thoracotomy. Partial ($n=6$) or total lobectomy ($n=5$) with stapler devices ($n=10$) or surgical ligation ($n=1$) was performed. Histopathology was performed in ten of 11 dogs and was consistent with pneumonia due to an infectious process or a migrating vegetable foreign body ($n=5$), pulmonary carcinoma ($n=2$), severe chronic neutrophilic and macrophagic pleuropneumonia ($n=1$), pulmonary bullae ($n=1$) or blastomycosis infection ($n=1$). Iatrogenic trauma to the left caudal lung lobe occurred in one dog via left intercostal thoracotomy. The mean duration of indwelling thoracic drain was 2.7 days (range 1 to 4). Complications occurred postoperatively in six dogs. In five of six cases, short-term postoperative complications were classified as minor and included wound infection ($n=1$), cough ($n=1$), dyspnoea ($n=1$), adverse reaction to medication ($n=1$) and inappetence ($n=1$). One case developed a major complication, pneumothorax with dehiscence of the lobectomy site, and revision surgery was required. All dogs survived hospital discharge.

**Clinical Significance:** Accessory lung lobectomy is uncommon and can be performed either via left- or via right-sided intercostal thoracotomy.

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## INTRODUCTION

The accessory lung lobe (ALL) occupies a central position within the thoracic cavity; specifically, it is located in the mediastinal recess between the diaphragm and the apex of the heart (Mather et al., 2023). The caudal vena cava and the right phrenic nerve run in direct contact with the ALL through a notch that separates the dorsal process of the ALL from the right lateral process. For this reason, combined with the presence of numerous ligaments, the surgical approach to this lobe is often considered more challenging compared to other lung lobes (Evans & de Lahunta, 2013; Mather et al., 2023).

Lobectomy of the ALL is uncommon (Lora-Michiels et al., 2003) and has previously been reported for pulmonary lobe torsion, foreign body removal and neoplasia (Benavides et al., 2019; Cerquetella et al., 2013). Surgical approaches to



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cranial and caudal lung lobes in dogs are widely described, but no specific description exists for the ALL (Bleakley et al., 2018; Monnet, 2018). Reported cases of accessory lung lobectomy have been described through both median sternotomy and right lateral thoracotomy approaches (Bleakley et al., 2018; Lora-Michiels et al., 2003; Monnet, 2018). However, a search of the database Medline and ScienceDirect with the string "dog", "accessory", "lung" and "lobectomy" on January 5, 2024, reported no clinical cases of lobectomy of the accessory pulmonary lobe via left thoracotomy.

In a recent study by Mather et al., the authors stated that a right lateral thoracotomy at the sixth intercostal space is the most feasible method to approach and resect the ALL. At the same time, according to the same authors, complete lobectomy via left lateral thoracotomy is not considered possible, although a partial lobectomy of the ventral process is technically feasible (Mather et al., 2023). Lobectomy of the ALL has been described in a cadaveric study using a thoracoscopic-assisted technique through the right sixth intercostal space (Singh et al., 2019).

There is a paucity of literature describing the clinical outcome following lobectomy of the ALL. The aim of the study was to describe ALL lobectomy performed either via right or left intercostal thoracotomy and report on complications and outcomes in a small population of dogs.

## MATERIALS AND METHODS

### Study design and inclusion criteria

The present study was conducted in the form of a retrospective multicentre case series, and medical record databases of three veterinary referral hospitals were reviewed for client-owned dogs undergoing ALL lobectomy between August 2009 and August 2023. Only dogs diagnosed with single or multiple lesions of the ALL based on clinical signs and imaging and undergoing lobectomy of the ALL were included in the study. Dogs with a follow-up period of <14 days, except for those that died within this time frame, and those lacking information regarding signalment, history, diagnostics, surgical approach, type of surgical procedure (partial or total lobectomy), surgical technique, type of devices used, intraoperative findings, and complications were excluded.

### Medical records search

The medical record management system of each hospital was searched using the keywords "accessory lung lobe" and "accessory lung lobe lobectomy" for records of dogs belonging to the canine species. Where this search function was not available, the investigator's case log was searched instead. The search took place between August 1, 2009, and August 31, 2023. Four investigators conducted independently the same search for this study.

### Data extraction

Cases were collected based on a search on the hospitals' practice management databases and on the surgeons' case-log Microsoft Excel spreadsheets. Descriptive information including signalment, history (presenting complaint and duration of clinical signs), physical examination, imaging findings, laboratory data, culture results, treatment method, perioperative complications (intraoperative and post-operative), length of hospitalisation, length of indwelling thoracic drain, need for further intervention and histopathology were recorded.

### Treatments administered and diagnostics performed

All dogs underwent diagnostic imaging before surgery; the type of diagnostic imaging performed and the diagnostic findings were collected.

Surgical approach, other lobe lung lobes involvement, type of surgical procedure (partial or total lobectomy), surgical technique, type of devices used, intraoperative findings and complications were recorded for each case.

### Follow-up

Follow-up data, consisting of treatment response, morbidity and mortality rate, were obtained from the medical records and telephone calls with the clients.

A postoperative complication was considered as any deviation from the normal postoperative course, classified as minor or major and divided into intraoperative, short-term (within 14 days after surgery) and long-term postoperative complications (beyond 14 days after surgery) (Follette et al., 2020).

### Data reporting and statistics

Using the above-mentioned criteria, a spreadsheet (Microsoft Excel 365, Microsoft Corporation, Redmond, WA) was created that included one row for each individual patient and one column for each variable evaluated. Due to the small number of cases retrieved, only descriptive statistics were performed (Microsoft Excel 365). Reported values are displayed as median (range) or percentages.

## RESULTS

### Population summary

Eleven dogs met the inclusion criteria and represented breeds include English Setter ($n = 3$), English cocker spaniel ($n = 1$), Malinois ($n = 1$), German shepherd ($n = 1$), great Dane ($n = 1$), Weimaraner ($n = 1$), Rottweiler ($n = 1$), Anglo-Francais de Petite Venerie ($n = 1$) and a mix breed ($n = 1$). There were seven male dogs (six entire and one neutered) and four female dogs (two entire and two neutered). The median age of dogs was 5.3 years (range 1.4 to 12.4) and median body weight was 26.5 kg (range 10.5 to 54.5).

### Clinical signs and laboratory examinations

The most frequent clinical signs were cough ($n = 5$), lethargy ($n = 5$), hyperthermia ($n = 3$) and anorexia ($n = 3$). Other clinical signs included dyspnoea ($n = 2$), kyphosis ($n = 1$) and pale mucous membranes ($n = 1$). In one case, lung pathology was an incidental finding during investigation for an intraocular blastomycosis. Results are summarised in Table 1.

**Table 1. Cases, signalment, clinical findings and CT findings, and surgical data**

| Case | Signalment | Clinical signs | CT findings | Approach | Surgery | Type of device | Intraoperative complications |
|---|---|---|---|---|---|---|---|
| 1 | Malinois<br>ME<br>1 y 5 m | Cough | Focal accessory lung lobe pneumopathy with bilateral pneumothorax | Right V ICS | Partial lobectomy ALL | TA 60 mm (height 3.5 mm, blue) | N |
| 2 | Weimaraner<br>FE<br>4 y 11 m | Cough, anorexia and lethargy | FB in accessory lobe with suspected left cranial and caudal lobe rupture and pneumothorax | Left V ICS | Total lobectomy ALL + partial lobectomy left cranial and caudal | Accessory: ENDO GIA 60 mm<br>Left cranial: TA 30 mm (height 3.5 mm, blue reload)<br>Left caudal: TA 60 mm (height 3.5 mm, blue) | N |
| 3 | English cocker spaniel<br>ME<br>11 y 7 m | Lethargy, pale mucous membrane and vomiting | Accessory lung lobe mass with mediastinal lymphadenopathy | Right VI ICS | Total lobectomy ALL | TA 30 mm (height 3.5 mm, blue) + Hemoclips | N |
| 4 | English setter<br>ME<br>2 y 2 m | Lethargy and hyperthermia | Right caudal lung lobe pneumonia with pleural subcystic lesion | Right VI ICS | Total lobectomy ALL + partial lobectomy right caudal lung lobe | Accessory: TA 30 mm (height 3.5 mm, blue reload)<br>Right caudal: TA 60 mm (height 3.5 mm, blue) | N |
| 5 | English setter<br>FN<br>5 y 1 m | Lethargy, anorexia, cough and hyperthermia | Subpleural lung abscess close to the accessory lung lobe | Right VI ICS | Total lobectomy ALL | TA 60 mm (height 3.5 mm, blue) | N |
| 6 | German shepherd<br>ME<br>2 y 2 m | Dyspnoea and kyphosis | Multiple lung lacerations and vertebral arch fracture of T1-T2 | Right VI ICS | Partial lobectomy ALL, right medium and caudal | TA (size not recorded) | N |
| 7 | Anglo-French Hound<br>ME<br>3 y 3 m | Cough | Focal bronchopneumopathy of the right and left caudal lung lobes | Right V ICS | Partial lobectomy ALL and right caudal | Accessory: TA 30 mm (height 3.5 mm, blue)<br>Right caudal: TA 60 mm (height 3.5 mm, blue) | N |
| 8 | Great Dane<br>FE<br>4 y 10 m | Dyspnoea and lethargy | Subpleural gas cystic formations of the accessory lobe or right caudal lobe with pneumothorax | Right VI ICS | Partial lobectomy ALL | TA 30 mm (height 3.5 mm, blue) | N |
| 9 | English setter<br>ME<br>6 y 8 m | Cough, anorexia and hyperthermia | Focal pulmonary consolidation of right caudal lobe and accessory associated with lymphadenopathy | Right VI ICS | Partial lobectomy ALL and right caudal | Continuous overlapping suture with polydioxanone | N |
| 10 | Rottweiler<br>MN<br>4 y | Squinting right eye | Incidental finding of non-contrast enhancing solitary mass within the accessory lung lobe | Right V ICS | Total lobectomy ALL | TA 30 mm (height 3.5 mm, blue) | N |
| 11 | Mix Pug<br>FN<br>12 y 5 m | Cough 8 months prior that resolved | Left caudal lung lobe mass with lymphadenopathy | Left VATS with left VI ICS | Partial lobectomy ALL and TB lymphadenectomy | TA 30 mm (height 3.5 mm, blue) | Iatrogenic lesion to the Left caudal LL requiring partial lobectomy |

ALL Accessory lung lobe, ENDO GIA Endoscopic gastrointestinal anastomosis stapler, FB Foreign body, FE Female entire, FN Female neutered, ICS Intercostal space, m Months, ME Male entire, MN Male neutered, N No, T Thoracic vertebra, TA Thoracoabdominal stapler, TB Tracheobronchial, VATS Video-assisted thoracic surgery, y Year

Six of 11 dogs had no comorbidities; the other dogs had mitral insufficiency and cutaneous plasmacytoma ($n = 1$), vertebral arch fracture of the first two thoracic vertebrae ($n = 1$), asthma ($n = 1$), thyroid carcinoma ($n = 1$) and concurrent vegetable foreign body in the right caudal lung lobe ($n = 1$). Duration of the clinical signs prior to presentation varied between 1 and 60 days (mean duration 11.5 days).

Complete blood cell count, serum biochemistry and urinalysis were performed in ten dogs; of these, nine also underwent electrophoresis and coagulation tests. The main alteration detected was leucocytosis ($n = 7$), followed by hyperfibrinolysis ($n = 3$), hyperazotaemia ($n = 3$), hypercholesterolaemia ($n = 2$), increased muscle enzymes ($n = 2$), hypoalbuminaemia ($n = 1$), hyperamylasemia ($n = 1$), mild non-regenerative anaemia ($n = 1$) and bilirubinaemia ($n = 1$).

Cytology and culture of the pleural effusion or lung was performed in three dogs. The cytology resulted in moderate polymicrobial bacterial colonisation (case 2 and case 4) and no diagnosis in case 1. The cultures isolated were *Streptococcus mitis* and *Streptococcus oralis* in case 2 (sensitive to aminopenicillin) and

*Acinetobacter baumannii* in case 4 (sensitive to aminopenicillin), while no growth was detected in case 1.

In other three dogs, cytological examination of the lung before surgery was performed and showed severe polymicrobial bacterial colonisation ($n = 2$) and bronchoalveolar carcinoma ($n = 1$).

## Diagnostic imaging

Radiography and CT were performed in all cases. Pneumothorax and focal pneumopathy were the most common findings ($n = 5$). In three cases, the ALL had a mass of suspected neoplastic origin. Among them, one dog had a CT diagnosis of left caudal lobe tumour, but during surgical exploration, the origin of the tumour was identified in the ALL. A subpleural abscess adjacent to the ALL ($n = 1$), the presence of a pulmonary bulla ($n = 1$) and a subpleural cystic lesion localised on the mediastinal side of the ALL ($n = 1$) were also identified. Multiple pulmonary lacerations were found in case 6 following motor vehicle trauma. The presence of thoracic lymphadenopathy was identified in four dogs. Other findings included pleural effusion ($n = 2$), abdominal effusion ($n = 1$), secondary oesophageal compression ($n = 1$) and vertebral fractures ($n = 1$).

Case 3 also underwent thoracic ultrasonography: a caudal thoracic mass in contact with the heart wall and the presence of pleural effusion were noted.

Bronchoscopy was performed in four dogs with evidence of focal bronchopathy of the accessory lobe; however, a bronchial foreign body was found in only one case.

## Treatment

All dogs underwent ALL lobectomy, and all surgeries were performed by board-certified surgeons. Right lateral thoracotomy (V or VI intercostal space) was performed in nine of 11 cases, while the left approach was performed in two of 11 cases (V and VI intercostal space). In case 10, the surgical procedure started as a thoracoscopy to visualise the mass and then converted to open thoracotomy for the lobectomy. In case 11, a video-assisted thoracoscopic surgery (VATS) procedure through the left approach was adopted. No median sternotomy was performed.

Partial lobectomy of the ALL was performed in six of 11 cases [through right ($n = 5$) or left ($n = 1$) thoracotomy], while total lobectomy was performed in the remaining five of 11 dogs [through right ($n = 4$) or left ($n = 1$) thoracotomy].

Lobectomy procedures utilised a stapler device in ten of 11 dogs: thoracoabdominal stapling device alone ($n = 8$) (TA 60 or 30 mm stapler, height 3.5 mm blue cartridge; Medtronic, Minneapolis, Minnesota), TA stapler combined with metal ligation system ($n = 1$) (Hemoclip; Teleflex, Morrisville, North Carolina) and Endo-GIA staplers ($n = 1$) (Endo-GIA™ stapler, 60 mm, purple; Covidien). In one case, partial lobectomy was performed through continuous overlapping hemostatic-pneumostatic sutures employing 3-0 polydioxanone. The choice of surgical technique was made according to the surgeon's preference, availability of stapler device, user friendliness and the type of lobectomy (partial *vs.* total).

In five of 11 cases, involvement of the other seven lung lobes was noted, including the right caudal ($n = 4$), right middle ($n = 1$), left cranial ($n = 1$) and left caudal ($n = 1$) lobes. In three cases, a singular concomitant lung lobe (right caudal) was approached in addition to ALL; while in two cases, multiple lobes, in addition to ALL, [case 2 (left cranial and caudal lobes) and case 6 (right caudal and middle lobes)] were resected.

Additional procedures were performed in four dogs: parietal mediastinal pleura suture ($n = 1$), pleural biopsy ($n = 1$), tracheobronchial lymph node resection ($n = 1$) and left thyroidectomy ($n = 1$).

Chest drainage was applied in all dogs for a mean of 2.7 days (range 1 to 4). Results are summarised in Table 1.

## Histopathological findings and diagnosis

Histopathology was performed in ten of 11 dogs and was consistent with pneumonia due to an infectious process or a migrating vegetable foreign body ($n = 5$), pulmonary carcinoma ($n = 2$), severe chronic neutrophilic and macrophagic pleuropneumonia ($n = 1$), pulmonary bullae ($n = 1$) or blastomycosis infection ($n = 1$). In the two cases of pulmonary carcinoma, the surgical margins were considered histologically adequate. No histological examination was performed on clinical case 6, who was hit by a car.

Based on the radiographic, CT, endoscopic and histopathological findings, the lesions of the ALL in this study included migrating foreign body ($n = 5$), tumours ($n = 2$), presence of an infectious process ($n = 1$), lung bullae ($n = 1$), blastomycosis infection ($n = 1$) and multiple lung lacerations secondary to road traffic accident ($n = 1$). Migrating foreign bodies were diagnosed after CT scan examination. Additional bronchoscopy was performed in four of five cases at the same time of CT exam; however, in only one case was the foreign body visualised but not removed.

## Complications

There was no intraoperative complication for all dogs except one. In case 11, performed via VATS on the left side, an iatrogenic lesion to the left caudal lung lobe occurred and required a partial lobectomy.

Six dogs suffered short-term postoperative complications (within 14 days). In five out of six cases, these complications were classified as minor (Follette et al., 2020) and included skin wound infection caused by *Bacteroides pyogenes* ($n = 1$), cough ($n = 1$), adverse reaction to intravenous antibiotics ($n = 1$), inappetence ($n = 1$) and increased respiratory rate ($n = 1$). However, one case (case 6) developed a major complication, pneumothorax, with dehiscence of the lobectomy site 12 days after surgery. Revision surgery of the previous surgical site and additional partial lung lobectomy of the right cranial lung lobe were performed (Table 2).

Long-term postoperative minor complications (>14 days) developed in three dogs. Case 2 developed a subcutaneous granuloma secondary to the presence of another plant foreign body 36 days after surgery. Thus, it was removed under ultrasound guidance without the need for surgical intervention. Case 3 developed vomiting associated with the administration of chemotherapy. Case 7 had a suspected pulmonary foreign

**Table 2. Outcome, histology findings and additional treatment**

| Case | Outcome | Complications | Histology findings | Additional treatment |
|---|---|---|---|---|
| 1 | Alive | None | Vegetable FB | N |
| 2 | Alive | Subcutaneous granuloma 36 days post-operation | Vegetable FB | Another FB retrieved US guided |
| 3 | Dead 395 days post-operation | Vomiting secondary to chemotherapy | Pulmonary carcinoma | Medical treatment |
| 4 | Alive | None | Vegetable FB | N |
| 5 | Alive | None | Severe chronic neutrophilic and macrophagic pleuropneumonia | N |
| 6 | Dead 33 days post-operation | Pneumothorax with secondary pyothorax (12 days post-operation) | N | Surgical revision previous site and partial lobectomy right cranial lung lobe |
| 7 | Alive | Vegetable FB recurrence 1 year post-operation | Vegetable FB | Medical treatment |
| 8 | Alive | None | Pulmonary bullae: multifocal to diffuse alveolar emphysema associated with areas of pulmonary atelectasis | N |
| 9 | Alive | Inappetence | Vegetable FB | Resolved prior discharge |
| 10 | Dead 164 days post-operation | IMHA | Blastomycosis | Euthanasia |
| 11 | Alive | None | Pulmonary carcinoma | N |

FB Foreign body, IMHA Immunomediated haemolytic anaemia, US Ultrasound

body recurrence 1 year postoperatively, but the owner refused the surgery; therefore, conservative therapy with the administration of antibiotics was performed.

### Outcome

All dogs survived surgery and were discharged. Median time of hospitalisation from surgery to discharge was 15 days (range 2 to 28).

The mean duration of follow-up was 137 days (range 21 to 395). At the last follow-up, three dogs were dead. Case 3 was euthanased 395 days after developing lung metastases of bronchoalveolar carcinoma, while case 6 died from disseminated intravascular coagulation 33 days after surgery. Finally, case 10 was euthanased 164 days after surgery due to the development of immunomediated haemolytic anaemia not responsive to treatment (Table 2).

## DISCUSSION

In this study, the authors presented a case series involving ALL lobectomy performed via right or left lateral thoracotomy. In most cases, the right-sided approach was preferred, in line with literature's guidelines, except for two cases where left thoracotomy was preferred for concurrent intervention on the left lung lobes and to avoid an additional separate intercostal approach.

As previously reported, CT has been demonstrated to be more sensitive than thoracic radiography studies in detecting pulmonary changes and the location of lung lesions (Masseau & Reinero, 2019).

In five of 11 dogs, the ALL was not the only lung lobe affected, and the right caudal lobe was the most affected one along with the ALL ($n = 4$). This trend could be justified by the anatomical relationships between the accessory and right caudal lung lobes. The ALL lies in contact with the right caudal lung lobe laterally, with venous drainage into the right caudal pulmonary vein (Monnet, 2018).

The most common pathology observed was the presence of vegetal foreign bodies within the ALL ($n = 5$). In literature, the ALL is reported as the lung lobe most frequently affected by vegetal foreign bodies, involved in 34% of all tracheobronchial tree and in 44% of the right lung lobes compartment (Cerquetella et al., 2013). This could be justified by the angle of attachment of the right accessory lobar bronchus, which, with the right caudal lobar bronchus, appeared to be more parallel to the right main bronchus than the others (Cerquetella et al., 2013). The other pathologies detected were tumours ($n = 2$), abscess formation ($n = 1$), lung bullae ($n = 1$), blastomycosis infection ($n = 1$) and multiple lung lacerations secondary to road traffic accident ($n = 1$). Both tumours detected in this study were histologically identified as pulmonary carcinoma, corresponding to the most common cause of primary pulmonary neoplasia in dogs (McPhetridge et al., 2022).

The decision of partial or total accessory lung lobectomy was primarily related to the dimension and localisation of the lesion. The ALL total lobectomy was in any case more difficult in relation to the deep location of the accessory lobe, the presence/interference of the caudal lung lobe and caudal vena cava, the presence of lateral and medial pulmonary ligaments of ALL and possible adherences due to the underlying disease that made the exteriorisation of the ALL more challenging.

Nine dogs underwent ALL lobectomy via right intercostal thoracotomy. The V or VI right intercostal approach was selected by the surgeon's preferences without any evidences of intraoperative or postoperative complications. However, in two cases (case 2 and case 11), the thoracotomy was performed on the left side (V and VI intercostal spaces, respectively). A left-sided approach was chosen in case 2 due to additional lesions localised in the left lung lobes. The left cranial and caudal lobes were affected by perforation due to migrating vegetable foreign body. In this case,

the surgeon performed partial lobectomy of the two left lobes, and then total ALL lobectomy was accessed by opening through the mediastinum. The total lobectomy of the accessory lobe was difficult but necessary in order to cure the patient's pathology, due to the proximity of the ALL lesion to its hilum. This procedure was probably made possible due to the previous partial lobectomy of the left cranial and caudal lobes, which allowed for greater intraoperative visibility and space. Case 11 had a large lung tumour misdiagnosed on the CT as affecting/originating from the left caudal lung lobe. During surgical exploration via thoracoscopy, the tumour was identified as affecting the accessory lobe; therefore, a partial lobectomy was judged sufficient to remove the tumour with adequate margins via VATS.

As reported in previous scientific studies, the right lateral thoracotomy at the sixth intercostal space is the most common access to the ALL for its surgical removal, due to the position of the caudal vena cava, right phrenic nerve and apical structures and ligamentous (Mather et al., 2023). However, in this case series, left thoracotomy was a viable option to access the ALL in the case of concomitant left lung lobe lesions. This approach allowed for surgical exploration of the left lung lobes and access to the ALL with a single surgical access after mediastinal pleura incision.

In contrast to the assumption of other studies, it was possible to perform total lobectomy of the ALL by performing a left thoracotomy. This may have been made possible due to the partial lobectomies of the left cranial and caudal lung lobes, which enhanced visualisation. This patient did not develop postoperative complications related to this surgical approach at the time of the last follow-up (84 days post-operation). Different surgical procedures were performed based on the surgeon's preferences, but in one case, the TA stapler was difficult to use due the stapler dimension, patient's deep chest and ALL position, and a small, ergonomic and articulating Endo-GIA stapler was preferred for ALL lobectomy.

No specific information on the prognosis and outcome of ALL lobectomies is available in the literature. In this study, all dogs survived to surgery and to discharge. In the last follow-up, three dogs were dead, but no one died from causes related to the ALL lobectomy. Only one dog (case 6) developed a major complication. The exact cause of the pneumothorax, which occurred 12 days postoperatively, remains unknown. However, we hypothesise that potential contributing factors could include an inappropriate TA cartridge size or the compromised condition of the lung lobe, which may have developed multiple lesions near the previous surgical site. The limitations of this study include its retrospective nature, the relatively small number of participating institutions and, consequently, the limited number of clinical cases available for analysis. In addition, there is a lack of control over case selection bias and variations in surgeon experience. Surgical access via left thoracotomy was performed in only two dogs. Therefore, this is a potential area for further investigations.

In conclusion, this study describes for the first time that accessory lung lobectomy can be performed either via left- or via right-sided intercostal thoracotomy. The right approach can be used routinely, while the left approach may be indicated in case the left lung lobes also need to be investigated.

## Conflict of interest

None of the authors of this article has a financial or personal relationship with other people or organisations that could inappropriately influence or bias the content of the paper.

## Author contributions

**N. Cremaschini:** Data curation (lead); formal analysis (equal); investigation (equal); writing – original draft (lead). **B. Hertel:** Data curation (equal); formal analysis (equal); investigation (equal); writing – original draft (equal). **A. Singh:** Data curation (equal); formal analysis (equal); investigation (equal); writing – original draft (equal). **A. Aertsens:** Data curation (equal); formal analysis (equal); investigation (equal); writing – original draft (equal). **F. Cinti:** Conceptualization (lead); data curation (equal); formal analysis (equal); investigation (equal); project administration (equal); supervision (lead); writing – original draft (lead).

## Conflict of interest

Authors declare no conflict of interests for this article.

## Data availability statement

Data availble on request from the authors: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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