

## Nonsurgical resolution of caudal mediastinal paraesophageal abscess in a cat

Joohyun JUNG<sup>1)</sup> and Mincheol CHOI<sup>2)\*</sup>

<sup>1)</sup>Ilisan Animal Medical Center, Daehwa-dong 2030, Ilsanseo-gu, Goyang-si, Gyeonggi-do, 411-803, South Korea

<sup>2)</sup>Veterinary Radiology Department, College of Veterinary Medicine and Research Institute for Veterinary Science, Seoul National University, Seoul, 151-742, South Korea

(Received 21 October 2014/Accepted 14 December 2014/Published online in J-STAGE 27 December 2014)

**ABSTRACT.** A one-year-old, castrated male domestic short hair cat was admitted with a history of anorexia, regurgitation and pyrexia for two days. Fever and leukocytosis were identified. There were a large soft tissue density oval mass in the caudal mediastinum on thoracic radiographs, a fluid-filled oval mass in the caudal mediastinum on ultrasonography, and left-sided and ventrally displaced and compressed esophagus on esophagram. On esophageal endoscopy, there were no esophageal abnormalities. CT findings with a fluid filled mass with rim enhancement indicated a caudal mediastinal paraesophageal abscess. The patient was treated with oral antibiotics, because the owner declined percutaneous drainage and surgery. The patient was admitted on emergency with severe respiratory distress; and ruptured abscess and deteriorated pleuropneumonia were suspected. With intensive hospitalization care and additional antibiotic therapy, the patient had full recovery.

**KEY WORDS:** caudal mediastinal paraesophageal abscess, CT, feline

doi: 10.1292/jvms.14-0518; *J. Vet. Med. Sci.* 77(4): 499–502, 2015

Caudal mediastinal paraesophageal abscess (CMPA) is an uncommon mediastinal disease in dogs and cats, demonstrating abscess formation outside the esophagus in the caudal mediastinum. CMPA needs nearly always surgical intervention [4]. We report nonsurgical resolution of caudal mediastinal paraesophageal abscess with antibiotics and supportive care in a cat.

A one-year-old, castrated male domestic short hair cat, weighing 5.4 kg, was admitted with a history of anorexia, regurgitation and pyrexia for two days and decreased appetite, weight loss and nausea for a month. On physical examination, the patient had a fever of 40.4°C and tachypnea. Hematological examination revealed leukocytosis (24,400/ $\mu$ l).

Plain thoracic radiographs showed a large soft tissue density round mass in the caudal mediastinum, multifocal patchy alveolar infiltration in lung field and left caudal pleural thickening (Fig. 1). Abdominal ultrasound revealed a fluid-filled round mass without remarkable blood signals in the caudal mediastinum (Fig. 2). On esophagram using barium sulfate, the esophagus was left sided displaced and compressed by this round mass (Fig. 3). On esophageal endoscopy, there were no esophageal abnormalities including remnant foreign body, inflammation, perforation or fistula. To further evaluate the nature of this round mass, CT was performed under general anesthesia. There was a fluid density round mass with rim enhancement in the caudal mediastinal paraesophageal region. This mass compressed esophagus. And, multifocal

patchy infiltration in bilateral lung lobes, severer in the left caudal lung lobe and irregular left caudal pleural thickening were identified (Fig. 4). Therefore, based on these imaging findings, CMPA and pleuropneumonia were diagnosed clinically, although histopathologic and bacteriologic examinations were not performed. The patient was treated with oral antibiotics using amoxicillin and clavulanic acid 62.5mg/cat PO twice daily for 3 days before surgery. The patient showed better clinical signs with antibiotics, and the owner declined percutaneous drainage and surgery on the day of surgery. On 12 days of antibiotics treatment, the patient was admitted to the emergency department with acute respiratory distress. The patient showed tachypnea on physical examination. Body temperature was 39.3°C. Plain thoracic radiographs showed disappearance of the caudal mediastinal para-

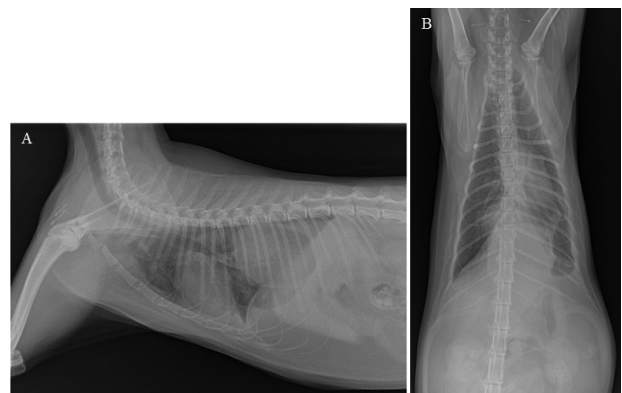


Fig.1. Right lateral (A) and ventrodorsal (B) thoracic plain radiographs show a soft tissue density round mass located in the caudal mediastinum. Sternal lymph node swelling, focal patchy alveolar infiltration and irregular left caudal pleural thickening are identified.

\*CORRESPONDENCE TO: CHOI, M., Department of Veterinary Medical Imaging, College of Veterinary Medicine, Seoul National University, Seoul 151-742, South Korea. e-mail: mcchoi@snu.ac.kr

©2015 The Japanese Society of Veterinary Science

This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial No Derivatives (by-nc-nd) License <<http://creativecommons.org/licenses/by-nc-nd/3.0/>>.

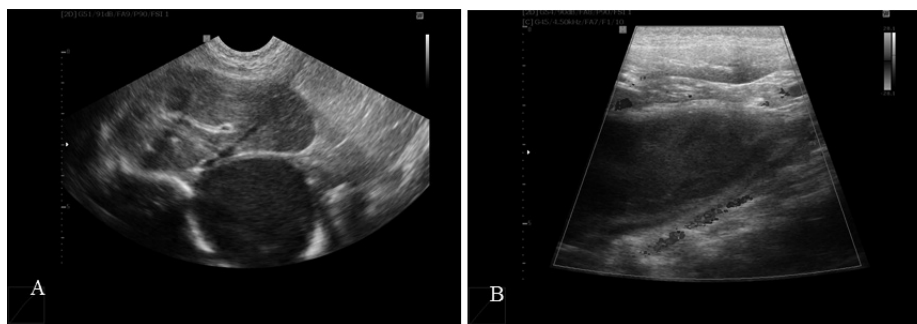


Fig. 2. Abdominal ultrasound demonstrates a hypoechoic cavitory oval mass filled with swirling fluid.

esophageal mass and increased patchy alveolar infiltration and pleural thickening in the left caudal lung lobe (Fig. 5). The mass was also not identified on ultrasonography. Unfortunately, bacteriologic examination was not performed, because there was only a small amount of pleural effusion, not enough for thoracentesis, in the left caudal lung field. Rupture or leakage of abscess and deteriorated pleuropneumonia were suspected, because there was no remarkable change of CMPA and pleuropneumonia on thoracic radiographs three days ago. On hematology, there was elevated WBC (25,600/ $\mu$ l) including remarkable increases in band neutrophil cells and toxic change in neutrophils. Other clinical chemistry results were within normal limits. The patient was further treated with combination antibiotics using metronidazole 15 mg/kg PO twice daily and amoxicillin and clavulanic acid 62.5 mg/cat PO twice daily with aggressive hospitalization care. The patient had full recovery for 21 days and showed no recurrence of abscess or pleuropneumonia. The patient is doing well without any other complications for one year.

CMPA is an uncommon disease characterized by abscess formation adjacent to the esophagus within caudal mediastinum [4]. General clinical signs of CMPA are pyrexia, lethargy and regurgitation associated with abscess and paraesophageal mass effect. Additionally, in the case of concurrent pulmonary infiltration or pleural effusion, there is coughing or respiratory distress [3, 4, 6, 8, 9, 13]. Main causes of CMPA are known for esophageal disorders including perforation due to an esophageal foreign body, endoscopic trauma and inadequate wound closure or surgical materials left within the operative field in case of esophageal cancer surgery in human and veterinary medicine [1, 3–8, 10, 11, 13]. This patient had CMPA and pleuropneumonia concurrently, although the etiology is poorly understood. There were no evidences associated with esophageal abnormalities. The esophagus was only associated with clinical signs of vomiting and anorexia, because of extrinsic compression by CMPA.

The most common bacteria associated with CMPA are *Nocardia sp* and *Actinomyces sp* in the previous veterinary studies [4, 13]. However, most reports submit no results of bacteriology, because of previous antibiotics treatment [4]. Unfortunately, sampling from CMPA was not performed, because the owners were afraid of complications of percu-



Fig. 3. Esophagram (A; right lateral view, B; ventrodorsal view) demonstrates that the esophagus is displaced to the left and ventrally and narrowed by the caudal mediastinal paraesophageal mass.

taneous drainage.

Treatment of CMPA needs mediastinal drainage with antibiotics effective against anaerobic bacteria. CMPA has favorable prognosis after aggressive surgical drainage. As initial CMPA drainage method, there has been surgical mediastinotomy and transdiaphragmatic abscess omentalization [4, 6]. In human, percutaneous drainage is indicated, if the patients are old and have disseminated intravascular coagulation, immunodeficiency, malnutrition or high risk of re-operation [2, 12]. Successful management of CMPA may depend on early diagnosis followed by aggressive surgical drainage and suitable antibiotic therapy, and correction of the underlying predisposing conditions. Fortunately, without surgical drainage, this patient had good prognosis, because of early diagnosis of CMPA, spontaneous rupture of mediastinal abscess, suitable antibiotic therapy and intensive supportive care.

Diagnostic imaging modalities, such as thoracic radiographs, abdominal ultrasonography, esophagram, endoscopy and CT, were all helpful to evaluate CMPA in this patient by stages. Plain thoracic radiographs are usually the first choice exploration in CMPA and offer rapid information of the lung and mediastinum including the esophagus. This cat had remarkable round widening of caudal mediastinum and suspi-

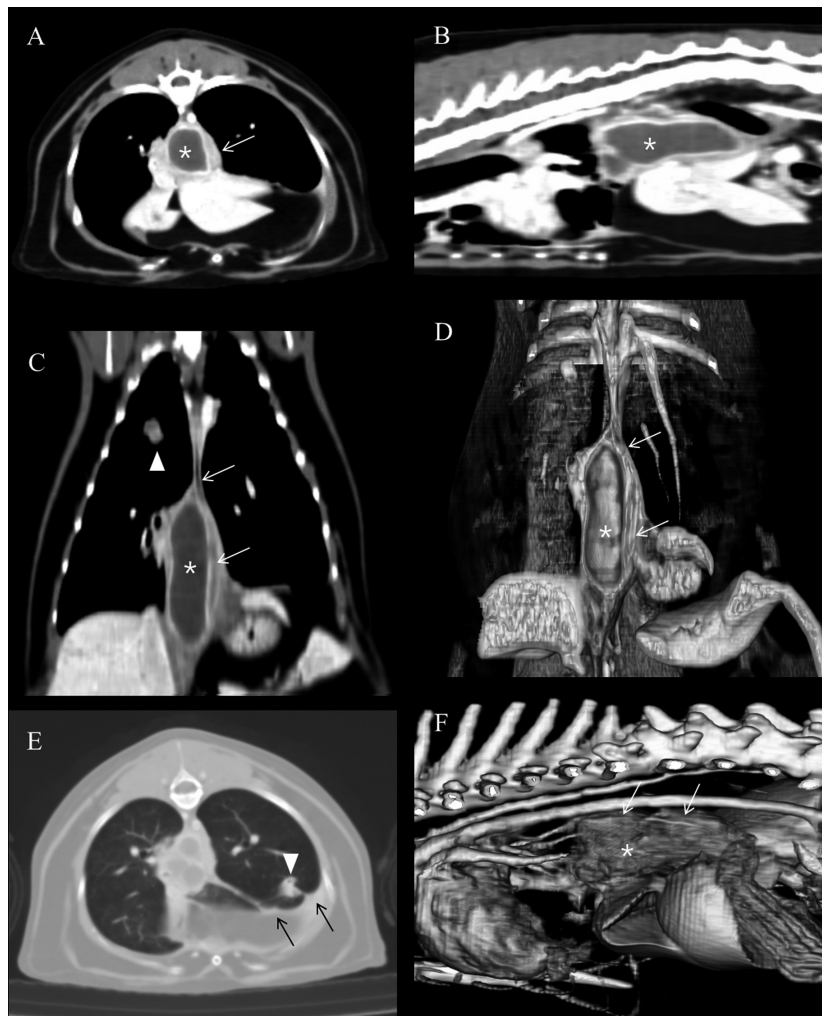


Fig. 4. Computed tomography indicates a hypoattenuating abscess with rim enhancement in the caudal mediastinum (asterisks in A, B, C, D and F). The esophagus (arrows in A, C, D and F) was compressed and displaced to the left by adjacent Cempa. There are no evidences to support association between the esophagus and Cempa at this time. There are multifocal patchy infiltration in bilateral lung lobes (arrowheads in C and E) and left caudal pleural thickening (black arrows in E).

cius pleuropneumonia. However, esophageal abnormalities or association could not be evaluated. This mass showed homogeneous soft tissue density without air on plain radiography. Because of no gas in the mass, abdominal ultrasonography was helpful. On ultrasonography, caudal mediastinal widening was a hypochoic movable fluid-filled mass with well defined wall in the caudal mediastinum. A hypochoic mass with heterogeneous internal echoes or septation, hyperechoic thick wall and peripheral blood signals can be specific ultrasonographic findings of abscess [9, 10]. Therefore, the ultrasonographic differential diagnosis includes a caudal mediastinal abscess. But, it could not also evaluate for esophageal relations. Esophagram with barium sulfate ruled out esophageal hiatal hernia and showed paraesophageal mass effect; left and ventral displacement of esophagus with flattening of esophageal lumen. There was no leakage of the contrast medium between esophagus and a caudal

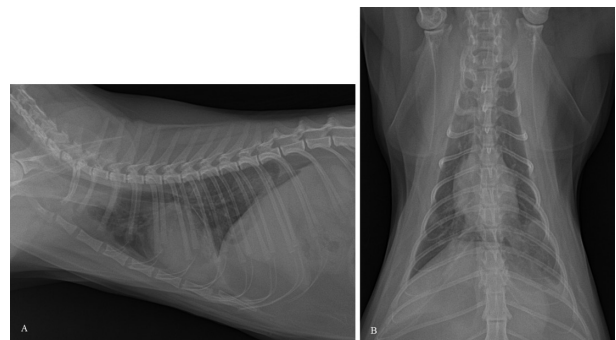


Fig. 5. Right lateral (A) and ventrodorsal (B) thoracic radiographs show resolution of Cempa and deterioration with left caudal pleuropneumonia when the patient is admitted on emergency with acute respiratory distress.

mediastinal mass. Endoscopy showed no abnormalities in the esophageal mucosa and ruled out remnant esophageal foreign body or small perforation. Therefore, the association and complement between plain thoracic radiographs, ultrasonography, esophagram and endoscopy were necessary for diagnosing CMPA in this patient. However, above all, CT was considered the best imaging modality of CMPA diagnosis compared with the previous imaging procedures. CT was specific in determining the nature of fluid filled paraesophageal mediastinal mass and pleuropneumonia. A hypoattenuating oval mass with rim enhancement of the circumference can be specific images of abscess on CT [4, 10, 14]. Therefore, CT findings were conclusive for CMPA in this patient. And, CT could rule out any other concurrent or underlying diseases. And, it helps choosing the precise surgical plan.

This is the first known documentation of non-surgical resolution of CMPA and pleuropneumonia by antibiotics in a cat. This case is unusual, because general CMPA needs surgical or percutaneous drainage, but this patient had suspicious spontaneous rupture of abscess and worse pleuropneumonia and overcame this condition with proper antibiotics and intensive supportive care. CMPA may be expected with good clinical outcome with prompt treatment after an early diagnosis, even failure of bacteriological examination and surgical drainage. However, CMPA may be life-threatening if not recognized in time. Fever and leukocytosis may be the most considerable evidences for abscess. And, readily available diagnostic imaging, such as thoracic radiographs, ultrasonographs, esophagram or endoscopy, is helpful for the diagnosis of CMPA complementally. However, CT is the critical diagnosing modality of CMPA.

## REFERENCES

- Ahmad, R., Ishlah, W., Shaharudin, M. H., Sathananthar, K. S. and Norie, A. 2008. Posterior mediastinal abscess secondary to esophageal perforation following fish bone ingestion. *Med. J. Malaysia* **63**: 162–163. [Medline]
- Arellano, R. S., Gervais, D. A. and Mueller, P. R. 2011. Computed tomography-guided drainage of mediastinal abscesses: clinical experience with 23 patients. *J. Vasc. Interv. Radiol.* **22**: 673–677. [Medline] [CrossRef]
- Barrett, R. J., Mann, F. A. and Aronson, E. 1993. Use of ultrasonography and secondary wound closure to facilitate diagnosis and treatment of a cranial mediastinal abscess in a dog. *J. Am. Vet. Med. Assoc.* **203**: 1293–1295. [Medline]
- Brisson, H. N., Burton, C. A., Doyle, R. S. and Bray, J. P. 2012. Caudal mediastinal paraesophageal abscesses in 7 dogs. *Vet. Surg.* **41**: 286–291. [Medline]
- Burnett, C. M., Rosemurgy, A. S. and Pfeiffer, E. A. 1990. Life-threatening acute posterior mediastinitis due to esophageal perforation. *Ann. Thorac. Surg.* **49**: 979–983. [Medline] [CrossRef]
- Franklin, A. D., Fearnside, S. M. and Brain, P. H. 2011. Omentalisation of a caudal mediastinal abscess in a dog. *Aust. Vet. J.* **89**: 217–220. [Medline] [CrossRef]
- Gianella, P., Pfammatter, N. S. and Burgener, I. A. 2009. Oesophageal and gastric endoscopic foreign body removal: complications and follow-up of 102 dogs. *J. Small Anim. Pract.* **50**: 649–654. [Medline] [CrossRef]
- Koutinas, C. K., Papazoglou, L. G., Saridomichelakis, M. N., Koutinas, A. F. and Patsikas, M. N. 2003. Caudal mediastinal abscess due to a grass awn (*Hordeum* spp) in a cat. *J. Feline Med. Surg.* **5**: 43–46. [Medline] [CrossRef]
- Osler, G. E. and du Preez, P. M. 1989. Application of ultrasound in the diagnosis and treatment of empyema and mediastinal abscess in a dog. *S. Afr. Med. J.* **76**: 174–175. [Medline]
- Schultz, R. M. and Zwingenberger, A. 2008. Radiographic, computed tomographic, and ultrasonographic findings with migrating intrathoracic grass awns in dogs and cats. *Vet. Radiol. Ultrasound* **49**: 249–255. [Medline] [CrossRef]
- Seiler, G., Rytz, U. and Gaschen, L. 2001. Radiographic diagnosis—cavitary mediastinal abscess. *Vet. Radiol. Ultrasound* **42**: 431–433. [Medline] [CrossRef]
- Simón-Yarza, I., Viteri-Ramírez, G., García-Lallana, A. and Benito, A. 2012. US-guided transhepatic drainage of a mediastinal abscess. *Radiologia* **56**: e21–24. [Medline]
- Sivacolundhu, R. K., O'Hara, A. J. and Read, R. A. 2001. Thoracic actinomycosis (arcanobacteriosis) or nocardiosis causing thoracic pyogranuloma formation in three dogs. *Aust. Vet. J.* **79**: 398–402. [Medline] [CrossRef]
- Yoon, S. J., Yoon, D. Y., Kim, S. S., Rho, Y. S., Chung, E. J., Eom, J. S. and Lee, J. S. 2013. CT differentiation of abscess and non-infected fluid in the postoperative neck. *Acta Radiol.* **54**: 48–53. [Medline]