

Abnormal Lobulation in a Dog's Right Lung

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Abstract: In this study, an abnormal lobulation of right lung, observed in a 3-4 years old, female Kangal dog was reported. The cranial lobe was found to be in two parts by means of an accessory fissure.

Key words: Abnormal lobe, accessory fissure, right lung, dog, chest, Turkey

INTRODUCTION

Right lung of the dog is separated in three lobes as cranial, medial and caudal by cranial and caudal interlobar fissures and also is recognized with its deep fissures.

Congenital anomalies of the lung are rare. Various forms have been recorded in calves particularly. Abnormal lobulation and fissures are quite common and are found incidentally at postmortem examination (Jubb *et al.*, 1993). Accessory fissures of the lung are commonly observed in lung specimens of human. Several accessory fissures of each one the five lobes are described by the anatomists (Von Hayek, 1960; Yamashita, 1978). Anatomically, an accessory fissure is a cleft of varying depth lined by visceral pleura (Godwin and Tarver, 1985). The part of lung that is separated off by an accessory fissure has been termed an accessory lobe (Foster-Carter, 1946). Although, accessory fissures are found anatomically in 50% of the lungs, they are less frequently demonstrated on chest radiographs or conventional CT scans (Von Hayek, 1960; Godwin and Tarver, 1985; Sofranik *et al.*, 1992).

Recognition of the accessory fissures provides additional information in segmental localization of pulmonary lesions, assessment of the extend of the pulmonary disease processes and assist in differential diagnosis of accessory fissures from normal anatomical and pathological structures (Sofranik *et al.*, 1992; Berkmen *et al.*, 1994).

Frequently, gross morphological variations including developmental malformations or anomalies in domestic mammals have been described in the literature (Ghoshal, 1989). In this study, an abnormal lobe formation observed in a dog's right lung was reported in consequence

of the lack of information about accessory fissures and lung abnormalities in domestic animal and dogs.

MATERIALS AND METHODS

A 3-4 years old, female Kangal dog of 28 kg body weight with no known clinical disorder was submitted for student education. The animal was anaesthetized with an intramuscular injection of xylazine HCl and ketamine HCl and exsanguinated through a cannula inserted into the common carotid artery. After the preparation of the cadaver with 10% neutral buffered formalin, dissection sets were used for cadaver dissection.

Measurements on specimen made with a digital compass (Mitutuyo Corporation, Kawasaki, Japan) and photographed (Nikon FA-35DX, Nikon Corporation Imaging Company, Japan). Schematized drawing created in adobe photoshop CS4. Fissure lengths measured on lung surface.

RESULTS AND DISCUSSION

The dog's right lung has showed an abnormal lobulation (Fig. 1). The cranial lobe was separated into two parts by means of an accessory fissure. The fissure was 6 cm long on the surface. Its depth was 1.5 cm at both ends and 0.5 cm in the middle (Fig. 2). The cranioventral part was between 1st and 5th ribs and the caudodorsal part was between 3rd and 6th ribs. The accessory fissure was extending from dorsal border in a straight caudoventral direction and was joining the cranial interlobar fissure. The cranial interlobar fissure was showing an angular structure (Fig. 2). The length of the fissure between the cranioventral part and the medial lobe

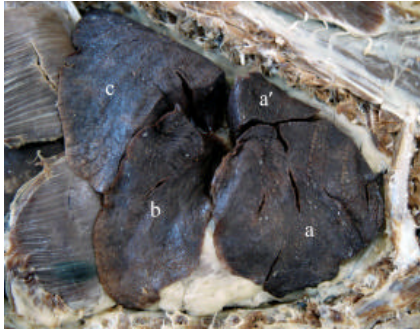


Fig. 1: The right lung from costal surface. a-Cranioventral part of cranial lobe; a': Caudodorsal part of cranial lobe; b: Medial lobe and c: Caudal lobe



Fig. 2: Schematic view of the right lung from costal surface. a-Cranioventral part of cranial lobe; a'-Caudodorsal part of cranial lobe; b- Medial lobe; c- Caudal lobe; 1-Accessory fissure 2; 2'-Cranial interlobar fissure; 3-Caudal interlobar fissure; 4-9- Accessory fissures of the cranioventral part; 10- Accessory fissure of the medial lobe and 11- Accessory fissure of the caudal lobe

was 7 cm with a depth 3 cm (Fig. 2). This part was lying among 4 and 5th ribs. The length of the cranial interlobar fissure between the caudodorsal part of the cranial lobe and the medial lobe was 3 cm with a depth 2.5 cm (Fig. 2) and this part was lying in a straight cranioventral direction among 5 and 6th ribs.

Apart from these, there were also some minor accessory fissures of the cranioventral part, medial lobe and caudal lobe. The 1st accessory fissure of the cranioventral part was on the front in a v shape with a length 2 cm and a depth 0.5 cm (Fig. 2/4). The 2nd one on the front was showing a wavy line with a length 4.5 cm and a depth 1.7 cm (Fig. 2/5). The fissure, beginning from

the ventral border of the lung, was in a straight direction with a length 2.2 cm and depth 0.3 cm (Fig. 2/6). The fissure lying on the upper side of the cranioventral part was in a slight s shaped 2 cm long with a depth 0.5 cm (Fig. 2/7). There were two more fissures lying straight on the costal surface of the cranioventral part with lengths 2.5 and 1 cm and depths 1 and 0.5 cm, respectively (Fig. 2/8, 9).

The accessory fissure of the medial lobe was in dorsoventral direction on the costal surface and the accessory fissure of the caudal lobe was extending from the mid-level of the caudal interlobar fissure with a cranioventral direction. The lengths were 2 and 1.3 cm and depth were 0.5 and 1 cm, respectively (Fig. 2/10, 11).

Additional fissures are thus the most common variant in pulmonary development (Foster-Carter, 1946). They are more frequent in fetal and neonatal lung specimens than in adults (Yamashita, 1978; Prejzner-Morawska and Urbanowicz, 1974). Abnormal lobes (Klein, 1970; Modgil *et al.*, 2006), accessory fissures (Marcatili *et al.*, 1968; Abdi, 1997; Aldur *et al.*, 1997; Camoglio *et al.*, 2005) and cases with both (Makhani and Kher, 1960; Meenakshi *et al.*, 2004) were reported in human. Prejzner-Morawska and Urbanowicz (1974) examined accessory fissures of the human foetus and newborn. Aldur *et al.* (1997) was reported an accessory fissure in right inferior lobe and Abdi (1997) was described in left superior lobe. Camoglio *et al.* (2005) was described a case of abnormal fissure in medial lobe.

Accessory fissures of the lung are common variations, often found in anatomic specimens but are infrequently demonstrated on chest radiographs and CT scans (Godwin and Tarver, 1985; Sofranik *et al.*, 1992; Berkmen *et al.*, 1994; Ariyurek *et al.*, 2001; Yildiz *et al.*, 2004). Fissures are more frequent on the right than on the left and may appear as a normal fissure line (Glazer *et al.*, 1991). The case in the right lung complies with their decision.

CONCLUSION

It is observed that recognition of accessory fissures and lobe anomalies of dog will give additional information for localization of segmental lung lesions. The anatomical variations of the lobation of the lungs, especially in lobectomies and in segmental resection must be taken into consideration by surgeons. From the radiological aspect, an accessory fissure is important in that it can be mistaken on chest radiographs or conventional CT scans.

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