

## RETROSPECTIVE STUDY ON THE PREVALENCE OF SPONDYLOSIS DEFORMANS IN THE CAT SPINE

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### Abstract

*In Veterinary Medicine, spondylosis is described as a non-inflammatory, degenerative disease of the peripheral region of the endplate, associated with new bone formation (osteophytes). The osteophytes vary from small spurs to bony bridges across the disc space, affecting one or more disc space. The ventral surface of the vertebral body usually is unaffected. The aim of this paperwork was to determine the severity and the distribution of spondylosis deformans in the cat spine.*

*There were examined a number of 41 cats between January – September 2014, including 30 females and 11 males. From the 41 cats examined, 12 of them were pure breed: Blue russian 1 (female), Birmanese 8 (7 females and 1 male), Persian 3 (females) and 29 from mixed breeds (19 females and 10 males). Rx was performed in latero-lateral and dorso-ventral orthograde views.*

*It was observed the presence of mild spondylosis in 23/41 (56.09%) cats, moderate spondylosis in 10/41 (24.39%) cats and severe spondylosis in 8/41 (19.51%) cats, specifying that a number of 7/41 (17.07%) cats have two or all three types of spondylosis. Location was as follows: none in the cervical region, only thoracal region 10/41 (24.39%), only lumbar region 6/41 (14.63%) cats, only thoraco-lumbar region 16/41 (39.02%) cats, only lumbo-sacral region 6/41 (14.63%) cats and on all three regions (thoracal, lumbar and sacral) a number of 3/41 (7.31%) cats.*

*Rx results are suggesting that females are more likely than males to spondylosis and the most affected regions are the thoraco-lumbar, followed by the thoracal ones.*

**Key words:** spondylosis, cat, rx, prevalence, osteophytes.

### INTRODUCTION

Along with the dog, cat is the most popular companion animal in Europe (estimated over 60 millions cats as companion animal) (Wise et al., 2002). Due to improvement of the veterinary medical services, all companion animals including cats have now an extended lifespan (Gunn-Moore, 2006). Like humans and dogs, cats ageing is accompanied by degenerative skeletal diseases, and most common are osteoarthritis and spondylosis deformans (spondylosis), but unlike cats, in humans and dogs another common skeletal disease is the diffuse idiopathic skeletal hyperostosis (DISH) (Kranenburg et al., 2010, Clarke et al., 2006).

Spondylosis is a non-inflammatory degenerative reaction of the peripheral region of the endplate, which results in new bone formation (osteophytes) (Carnier et al. 2002). Osteophytes may vary in size depending on

the severity of spondylosis from small spurs in mild spondylosis (grade 1), to bony bridges in severe spondylosis (grade 3). In between these two types of spondylosis is moderate spondylosis (grade 2) where the bony bridges are incomplete (Carnier et al., 2002). Classification of spondylosis is also performed by location (cervical spondylosis, cervico-thoracic spondylosis, thoracal spondylosis, thoraco-lumbar spondylosis, lumbar spondylosis, lumbo-sacral spondylosis) and by severity (mild spondylosis, moderate spondylosis and severe spondylosis) (Figeroth and Thomas, 2015).

Most cats with spondylosis deformans appear to be pain-free, that's why in some cases it may be an 'incidental finding' that is noticed when x-rays are taken for some other reason (Lascelles and Robertson, 2010). If an animal shows signs they are due to pressure of the new bone on spinal nerves, or on the spinal cord itself (Morgan and Pool, 2002).

But still little is known about the aetiopathogenesis of degenerative joint disease in cats, that's why more research in this area is needed (Lascelles et al., 2010). Severe spondylosis can be mistaken for DISH, which is a systemic disease of the axial and appendicular skeleton that results in the ossification of soft tissues including the ventral longitudinal spinal ligament, especially that DISH has not been reported in domestic cats (Kranenburg et al., 2010, Morgan and Stavenborn, 1991). Spinal hyperostosis similar to DISH has been described in dinosaurs, a saber-toothed cat and old rhesus monkeys (Bjorkengren, 1987). Some research studies trying to solve the mystery of aetiopathogenesis shows that in humans and cats, hypervitaminosis A is known to give rise to extensiv. new bone formation throughout the spinal column and the large peripheral joints (Seawright et al., 1967). In contrast, in dogs treated with 300,000 IU vitamin A on a daily basis for 2 months increased bone resorption and reduced bone formation in dogs was reported (Seawright et al., 1967).

## MATERIALS AND METHODS

This study was performed between January-September 2014 and involved a number of 41 cats, including 30 females and 11 males. All cats were referred to the Clinic of the Faculty of Veterinary Medicine Bucharest, for various medical conditions, though the majority of which involved pulmonary disease, ear-nose-throat disease, cancer, trauma, cardiac disease, and gastrointestinal disease. From the 41 cats examined, the vast majority were cross breeds 29/41(70.73%) involving 19/29 (65.52%) females and 10/29 (34.48%) males, and only 12/41 (29.27%) were pure breeds as follows: Blue russian 1 (female), Birmanese 8 (7 females and 1 male), Persian 3 (females). Rx was performed in latero-lateral and dorso-ventral orthograde views. Radiographs were evaluated using a spondylosis scoring system performed by Kranenburg et al. (2011).

## RESULTS AND DISCUSSIONS

The study consisted of 30 female cats (73.17%) and 11 male cats (26.82%). The mean age was 12.3 (range 5-18) years, and the mean body weight was 4.1 (range 1.5-6) kg. Our results showed the presence of mild spondylosis (Fig. 1), moderate spondylosis (Fig. 2) and severe spondylosis (Fig. 3) in different percentage as in tabel 1.

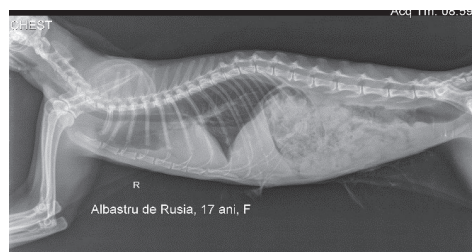


Fig. 1. Grade 1 (mild spondylosis) of spondylosis deformans in a 17 years old Blue russian female cat. Note the small spurs (osteophytes) at levels L1-L2 and L2-L3.

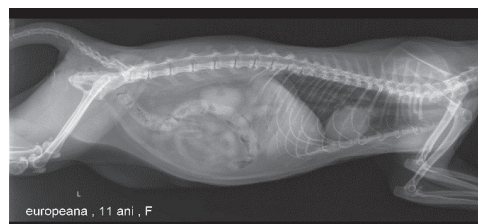


Fig. 2. Grade 2 (moderate spondylosis) of spondylosis deformans in a 11 years old cross breed female cat. Note the osteophytes at levels T11-T12, T13-L1, L1-L2.

The prevalence of mild spondylosis in this study was the most common (56.09%) followed by moderate spondylosis, and only a small number of cats had all grades of spondylosis (tabel 1). Kranenburg et al. (2012), showed that mild spondylosis was the most common, but the prevalence of severe spondylosis has a higher percentage than moderate spondylosis, which is in reverse to our study where the percentage is higher in moderate spondylosis (Kranenburg et al., 2012).

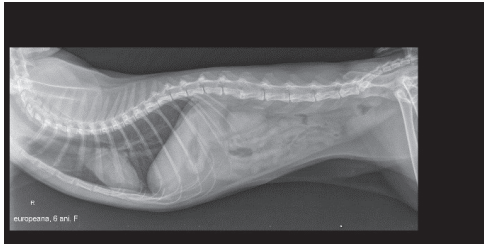


Fig. 3. Grade 3 (severe spondylosis) of spondylosis deformans in a 6 years old cross breed female cat. Note the bony bridge at level L2-L3.

Table 1. The prevalence of grades of spondylosis deformans on cats (n = 41)

Grade 1 (mild spondylosis)	Grade 2 (moderate spondylosis)	Grade 3 (severe spondylosis)	All grades (1, 2 and 3)
23/41 (56.09%)	10/41 (24,39%)	8/41 (19.51%)	7/41 (17.07%)

Regarding the prevalence of spondylosis deformans by age, our study revealed the presence of spondylosis deformans in a high percentage on cats older than 10 years (table 2). Previous studies have found that the prevalence of all grades of spondylosis increased with age (Kranenburg et al., 2012).

Table 2. The prevalence of spondylosis deformans according to age

1 to 6 years	6 to 10 years	10 to 18 years
1/41(2.44%) cats	8/41(19.51%) cats	32/41(78.05%) cats

In our study, spondylosis deformans was found most frequently both in the thoracal and lumbar region, followed by thoracal region only. The caudal thoracic region, cranial lumbar region and the lumbo-sacral region were reported to be most often affected by spondylosis (Read and Smith, 1968); spondylosis in the cervical spine is described less often (Morgan et al., 1989; Wright, 1982) so as in here were the no cat is affected in the cervical region (Table 3).

Table 3. The prevalence of spondylosis deformans by location

Only C region	Only T region	Only L region	T and L region	L-S region	T, L and S region
None	10/41 (24.39 %)	6/41 (14.63 %)	16/41 (39.02 %)	6/41 (14.63 %)	3/41 (7.31%)

\*C= cervical; T = thoracal; L = lumbar; S = sacral

In our study the distribution of the different grades of spondylosis along the vertebral column, revealed a peak at levels T11-T12 and L1-L2 (Fig. 4), unlike other studies (Clarke et al., 2005) which identified T6 to T10 as being the most commonly affected intervertebral disc joints (Clarke et al., 2005). Also, Kranenburg et al. (2012) revealed a peak at levels T4-T10. This is probably due to a larger number and breeds of cats examined by them.

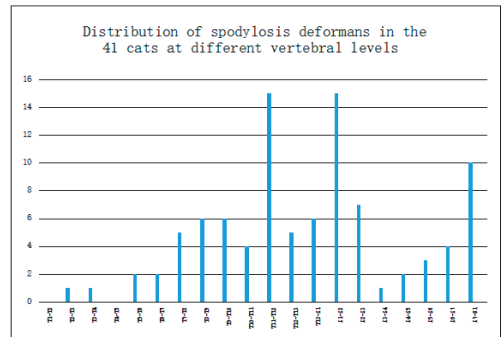


Fig. 4. Distribution of spondylosis deformans along the vertebral column; T= thoracal; L= lumbar; S= sacral.

However, severe spondylosis was found most often in the more caudal region of the spine (levels T11-L7), which is close to the most studies (levels T10-S1)(Kranenburg et al., 2012). The bodyweight of the cats was not associated with the severity of spondylosis, just like all studies (Kranenburg et al., 2012). Because some breeds were represented by only one or two cats, it was not possible to statistically analyse breed differences in the prevalence of spondylosis (Kranenburg et al., 2012). Thoracic vertebrae T4-T10 were most often affected by spondylosis, as reported earlier, but severe spondylosis was most common in the lumbo-sacral region of the

vertebral column, as found by others (Clarke and Bennett, 2006; Clarke et al., 2005; Kranenburg et al., 2012).

## CONCLUSIONS

Our study revealed that mild spondylosis was the most common (56.09%).

Levels T11-T12 and L1-L2 were the most affected ones.

It is obvious that the prevalence of spondylosis deformans is increased in cross breed cats (domestic Shorthaired).

Most cats were significantly old and the bodyweight of the cats was not associated with the severity of spondylosis.

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