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Demographics, clinical findings and diagnoses of cranial thoracic myelopathies (T1–T6 vertebrae) in cats

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Abstract

Objectives The aim of the study was to describe the patient demographics, clinicopathological features and presumptive or final diagnoses in cats with myelopathies between the T1 and T6 vertebrae.

Methods This retrospective multicentre case study enrolled cases between 2015 and 2022 that were diagnosed with myelopathies between the T1 and T6 vertebrae as the primary cause for the presenting clinical signs.

Results A total of 21 cases matched the inclusion criteria, 13 males (11 castrated and 2 entire) and 8 spayed females (median age 93 months; range 5–192). Most of the cases presented with a chronic and progressive history (76% and 86%, respectively), with a median duration of 29 days (range 1–2880). At the time of presentation, 90% of the cases were localised to the T3–L3 spinal cord segments based on neurological examination. The most common underlying pathology was neoplasia (42.9%), followed by inflammatory (24%), anomalous (19%), degenerative (9.5%) and vascular (4.8%) disorders. The most common location was T3–T4 (29%), followed by T2–T3 and T5–T6 (19% each). The cutaneous trunci reflex was normal in 86% of the cases and most of the cases (71%) did not show spinal discomfort upon admission.

Conclusions and relevance Neoplasia was the most common cause of cranial thoracic myelopathy in this study. The lack of pathognomonic clinical signs for this specific region highlights the importance of assessing the entire thoracolumbar region up to and including at least the T1 vertebra when investigating cases with signs consistent with a T3–L3 myelopathy.

Keywords: Cutaneous trunci reflex; neoplasia; spinal cord meningioma

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Introduction

Spinal cord disorders (myelopathies) are common in small animal practice, resulting in different clinical presentations according to the location of the lesion.[1] The spinal cord is divided into four functional regions based on the expected neurological deficits associated with a lesion affecting each region, and this neuroanatomic localisation is then used to guide further investigations (eg, advanced imaging). These functional divisions are the C1–C5, C6–T2, T3–L3 and L4–S3 spinal cord segments. Lesions affecting the T3–L3 spinal cord segments are particularly common in dogs and cats, likely owing to the frequency of intervertebral disc herniation (IVH) in this area.[2,3] However, inflammatory, neoplastic, traumatic and vascular disorders are also observed in this region

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and reported to be more common causes of spinal cord disease in cats in general.[1,2,4] Intervertebral disc herniation is reported to be more common in the lumbar region of cats,[5,6] and reports of disorders affecting the thoracic spinal cord in cats are currently limited to case reports and small case series, such as articular process hypertrophy resulting in vertebral canal stenosis,[7–10] vertebral hyperostosis,[11] intervertebral disc protrusion (IVDP),[12,13] subarachnoid diverticulum[14] and different types of neoplasia.[15,16]

A recent publication described the signalment, clinical presentation and differential diagnoses of cranial thoracic myelopathies (between the T1 and T6 vertebrae) in dogs;[17] however, to the authors' knowledge, there is still a lack of information on myelopathies affecting this region in cats. This information could be useful, as it may allow a clinician to advise the owner of an affected cat regarding the most likely differential diagnoses after suspicion of a lesion in this region, which could then be used to formulate a focused and appropriate diagnostic plan.

The aim of the present study was to describe the patient demographics, clinicopathological features, and presumptive or final diagnoses in cats with cranial thoracic spinal cord lesions. A secondary aim was to further investigate whether lesions within this region can present with (or without) certain neurological deficits that may influence both the final neuroanatomic localisation and region of interest in subsequent diagnostic imaging (eg, a 'two-engine gait' and C6–T2 localisation in a cat with a lesion caudal to T2, or a T3–L3 neuroanatomic localisation in a cat with a lesion cranial to T3).

Materials and methods

This multicentric retrospective study was approved by the Veterinary Medicine Research Ethics Committee of the University of Glasgow (EA07/21A). The databases of four referral hospitals in the UK (Hamilton Specialist Referrals, Anderson Moores Veterinary Specialists, Queen's Veterinary School Hospital, University of Cambridge and University of Glasgow Small Animal Hospital) were searched, between 2015 and 2022, for cats diagnosed with a lesion(s) involving the cranial thoracic spinal cord, defined as between the T1 and T6 vertebrae. The included cases were required to be diagnosed with pathology in this region on magnetic resonance imaging (MRI) and/or computed tomography (CT) that was considered the primary cause for the presenting clinical signs. Cases with a lesion that was considered an incidental finding at the time of imaging were excluded from the study. Clinical information obtained from the records included breed, age (in months), sex, neuter status, weight, onset and duration of the clinical signs, and physical examination findings. Regarding the neurological examination, the neuroanatomic localisation (according to the neurological examination), ambulation status, cutaneous trunci reflex (CTR) abnormalities, symmetry of the clinical signs, presence of urinary and/or faecal incontinence, hyperesthesia and observation of a 'two-engine gait' were also documented. 'Two-engine gait' was defined as a marked discrepancy in stride length between the thoracic and pelvic limbs, with short, rapid thoracic limb strides and slower, longer pelvic limb strides. The imaging modality used to achieve the diagnosis, location of the lesion in respect to the closest vertebral body, lesion characteristics and location in respect to the dura/spinal cord (extradural, intradural-extramedullary or intramedullary), other clinicopathologic findings, and presumptive or final diagnosis were also recorded. The absence of more specific data in the retrospective case records meant that the definitions of 'acute', 'chronic', 'progressive' and 'non-progressive' were limited to the terms used by each clinician in their clinical reports.

All the imaging studies were performed using MRI (1.5-T PetVet; Hallmarq Veterinary Imaging, 1.5-T Gyroscan Intera; Philips, 1.5-T Achieva; Philips and 1.5-T Intera Achieva; Philips, 0.27-T VetMR Grande; Esaote, 1.5-T Magnetom Essenza; Siemens) and/or CT (Somaton Perspective 64-slice; Siemens, Somaton Spirit Dual Slice; Siemens). The MRI protocol varied between institutions, but all studies included a minimum of a T2-weighted (T2W) sequence in the sagittal and transverse planes, and a T1-weighted (T1W) sequence in the transverse plane. When available, T2W sequences in the dorsal plane and T1W post-contrast sequences, using Gadobutrol (Gadovist; Bayer PLC), were also assessed. The CT studies were obtained in bone and soft-tissue algorithms, with Iohexol (Ominipaque; GE Healthcare) used as the contrast medium.

All imaging studies were retrospectively reviewed by a veterinary neurology resident (MB) and a board-certified specialist in veterinary neurology (DSM). The final diagnoses were grouped based on the definitive or presumptive disease process using the VITAMIN-D mnemonic. A descriptive statistical analysis and tables were performed with Microsoft Excel.

Results

In total, 25 cases were identified in the database searches, with 21 matching the inclusion criteria. The included cases were 13 males (11 castrated and two entire) and eight spayed females. The breed distribution was domestic shorthair (n = 15), domestic longhair (n = 3), Maine Coon (n = 1), Birman (n = 1) and Persian (n = 1).

The mean age at the time of diagnosis was 94 months, with a median age of 93 months (range 5–192). The median age for each specific disease group was as follows: neoplasia, 110 months (range 54–163); inflammatory infectious, 49 months (range 8–90); inflammatory immune-mediated, 117 months (range 8–173); anomalous, 87.5 months (range 5–192); degenerative, 86.5 months (range 60–113); and vascular with only one case aged 80 months.

Related to the onset of the clinical signs, 16 (76%) cases were reported as chronic and five (24%) were acute. In terms of progression, 18 (86%) cases were considered progressive and three (14%) non-progressive. The median duration of the clinical signs before presentation was 29 days (range 1–2880). For each group of diseases, the median duration of the clinical signs was as follows: neoplasia, 29 days (range 7–180); inflammatory infectious, 30 days (range 4–56); inflammatory immune-mediated, 17.5 days (range 7–28); anomalous, 57 days (range 21–2880); degenerative, 22.5 days (range 15–30); and vascular, 1 day.

Most of the cases were localised to the T3–L3 spinal cord segments (n = 19, 90%), with the remaining two cases localised to the C6–T2 spinal cord segments (n = 1, 5%) and multifocal (n = 1, 5%). The cases that were localised to the T3–L3 spinal cord segments were categorised based upon the presence of different degrees of paraparesis, pelvic limb ataxia, postural reaction deficits, and increased or normal spinal reflexes involving the pelvic limbs, in the absence of any visible abnormalities in the thoracic limbs. For the two cases not classified as a T3–L3 myelopathy, the neuroanatomic localisation was based on the presence of ambulatory tetraparesis with a 'two-engine gait' for the case with a C6–T2 spinal cord segment classification, and the presence of apparent discomfort on palpation of the neck and thoracolumbar region for the cat with a multifocal localisation. On neurological examination, 14 (67%) cases were ambulatory, including the case of ambulatory tetraparesis described above, and seven (33%) cases were non-ambulatory paraparetic. Clinical signs were symmetrical in 10 (48%) cases and asymmetrical in 11 (52%) cases, mostly lateralised towards the left side (n = 9, 82%). Apparent discomfort upon palpation of the vertebral column was reported in only six (29%) cases at the time of presentation. A 'two-engine gait' was reported only in one cat. An abnormal CTR was present in six (29%) cases, in which it was completely absent in five cats and interrupted at the level of T6 in one cat. Urinary incontinence was reported in seven (33%) cases, while none of the included cats presented faecal incontinence.

MRI of the thoracic vertebral column was performed in all cases, with contrast-enhanced CT additionally performed in four cases. In total, 11 (52%) lesions were considered extradural, four (19%) intradural-extramedullary and six (29%) intramedullary. With respect to the location of the different lesions within our area of interest, the most common location was over the T3–T4 vertebrae in six (29%) cases, followed by T2–T3 (n = 4, 19%), T5–T6 (n = 4, 19%), T1–T2 (n = 2, 10%) and T4–T5 (n = 1, 5%). A multifocal distribution, involving two or more intervertebral disc spaces or vertebral bodies, was seen in four (19%) cases.

Definitive or presumptive diagnoses included neoplasia (n = 9, 42.9%), followed by inflammatory disorders (n = 5, 24%), anomalies (n = 4, 19%), degenerative (n = 2, 9.5%) and vascular disease (n = 1, 4.8%). Of the cases classified as neoplasia, a final cytological or histopathological diagnosis was reached in four cases, which included two injection site sarcomas, a meningioma and a lymphoma associated with feline leukaemia virus (FeLV). In the other five cases, the presumptive diagnoses included lymphoma in two cases (of which one of the cats had a positive FeLV SNAP-test), two meningiomas and a local infiltration of suspected lung carcinoma. Among the five cases included in the inflammatory (infectious or immune-mediated) group, meningomyelitis due to feline infectious peritonitis (FIP) was confirmed in two cases (post-mortem examination in one case and excisional biopsy of an inflammatory granuloma in the other), two cats were diagnosed with suspected immune-mediated meningomyelitis and one case with an aseptic granuloma. In the group of anomalies, vertebral canal stenosis was diagnosed in three cases and arachnoid diverticulum in one. In the remaining cases, two cats presented with an IVDP (both at T3–T4) and one with presumed ischaemic myelopathy (at T2–T3) (Table 1).

Discussion

This study describes the demographics, onset, progression, clinical findings and final diagnosis (definitive or presumptive) in 21 cats with cranial thoracic myelopathies. Neoplasia was the most common aetiology affecting the cranial thoracic spinal cord (between the T1 and T6 vertebrae), seen in 9/21 cats, followed by inflammatory (infectious/immune-mediated) and anomalous disorders. Degenerative disease, comprising only two cats with IVDPs, was uncommon in this region in this population of animals. A previous study describing the most common spinal cord disorders in cats concluded that infectious diseases, more specifically FIP, were the most common cause of myelopathies in cats, followed by neoplasia.[6] This discrepancy could likely be explained due to the selection of the specific area of interest in our study, compared with the whole spinal cord in the aforementioned study and the low number of cases. The finding of neoplasia as the most common cause of cranial thoracic myelopathy in cats is similar to that recently reported for the same region in dogs, in which 39% were diagnosed with neoplasia.[13]

A previous study stated a relationship between age and a diagnosis of FIP, with FIP being most common in cats aged under 2 years but also the third most common cause of myelopathy in cats aged 2–8 years.[6] In the same study, neoplasia was found to be the most common spinal cord disorder in cats aged older than 8 years, similar to our study population in which the median age at diagnosis for all cats was 93 months (7.8 years) (median 9.2 years for those with neoplasia).

In our study, the most common types of neoplasia diagnosed were meningioma (n = 3) (Figure 1) and lymphoma (n = 3), followed by sarcoma (suspected injection

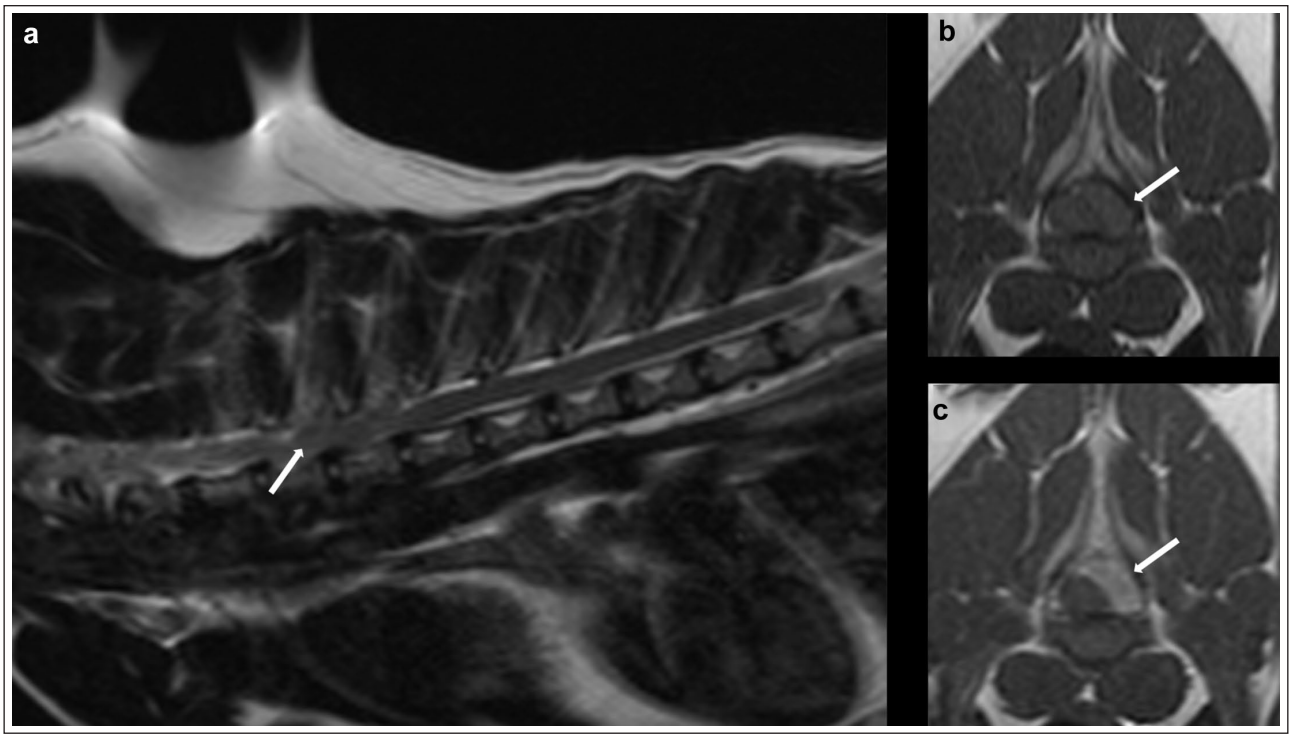

Figure 1 MRI examination of case 10 assessed due to a chronic and progressive history of pelvic limb proprioceptive ataxia over 4 weeks. The picture shows (a) sagittal T2W, (b) transverse T1W and (c) transverse T1W post-contrast sequences, with arrows pointing to an intradural-extramedullary mass with strong contrast enhancement at the level of the T3–T4 intervertebral disc space compatible with a meningioma. This was confirmed via excisional biopsy. T1W = T1-weighted; T2W = T2-weighted

associated, n = 2). This is in line with previous studies in which lymphoma was reported as the most common neoplasia affecting the spinal cord in cats,[4,6] followed by osteosarcoma. The 2008 study by Marioni-Henry et al[18] also stated that the most common location for neoplasia was the thoracic region, without data about the specific location, and in most cases, with an intradural appearance on diagnostic imaging (based on myelography). Sarcomas were the third most common neoplasia, which may be expected considering that the cranial thoracic/interscapular region is the most common site of subcutaneous injections, which have been associated with the development of such lesions.[16] It is possible that this type of neoplasia was not more prevalent in our population because of the implementation of vaccination guidelines for cats over the time of the study,[16] in which alternative sites have been suggested for injection that makes potential surgical resection easier to achieve via amputation.

Interestingly, meningioma and lymphoma were equally common in our population, albeit with a small sample size, possibly because meningioma is the most common non-lymphoid neoplasia affecting the vertebral canal in cats, followed by nerve sheath tumours.[19] Related to this, it is important to highlight the similarity of imaging features of both these neoplasias (typically intradural-extramedullary) and the lack of histopathological confirmation in some of our cases, which could have led to misdiagnosis. However, none of the cases presented had any visible involvement of the regional nerve.

Inflammatory conditions were the second most common group of disorders affecting the cranial thoracic spinal cord, in which two of the cases were confirmed as FIP (Figure 2). In the other cases, two were considered immune-mediated (meningomyelitis of unknown aetiology [MUA]) based on MRI and cerebrospinal fluid analysis, with no infectious agent identified, and one was classified as a non-infectious inflammatory granuloma after histopathological confirmation. Immune-mediated meningo(encephalo)myelitis has been reported in cats, although it is considered less common compared with dogs, with an apparently better prognosis based on the available literature.[20] Aseptic granulomas have been rarely reported in cats involving different areas (abdomen, nose, etc), with only two case reports describing an associated compressive myelopathy.[21,22]

Anomalies were the third most common type of disorder diagnosed in this study. Among these anomalies, the most frequent was vertebral canal stenosis owing to articular process hypertrophy (Figure 3). This condition has been reported in a case report of two cats[3] and a more recent case series of nine cats,[8] with a median age of 9 years reported by the latter study, which is slightly older

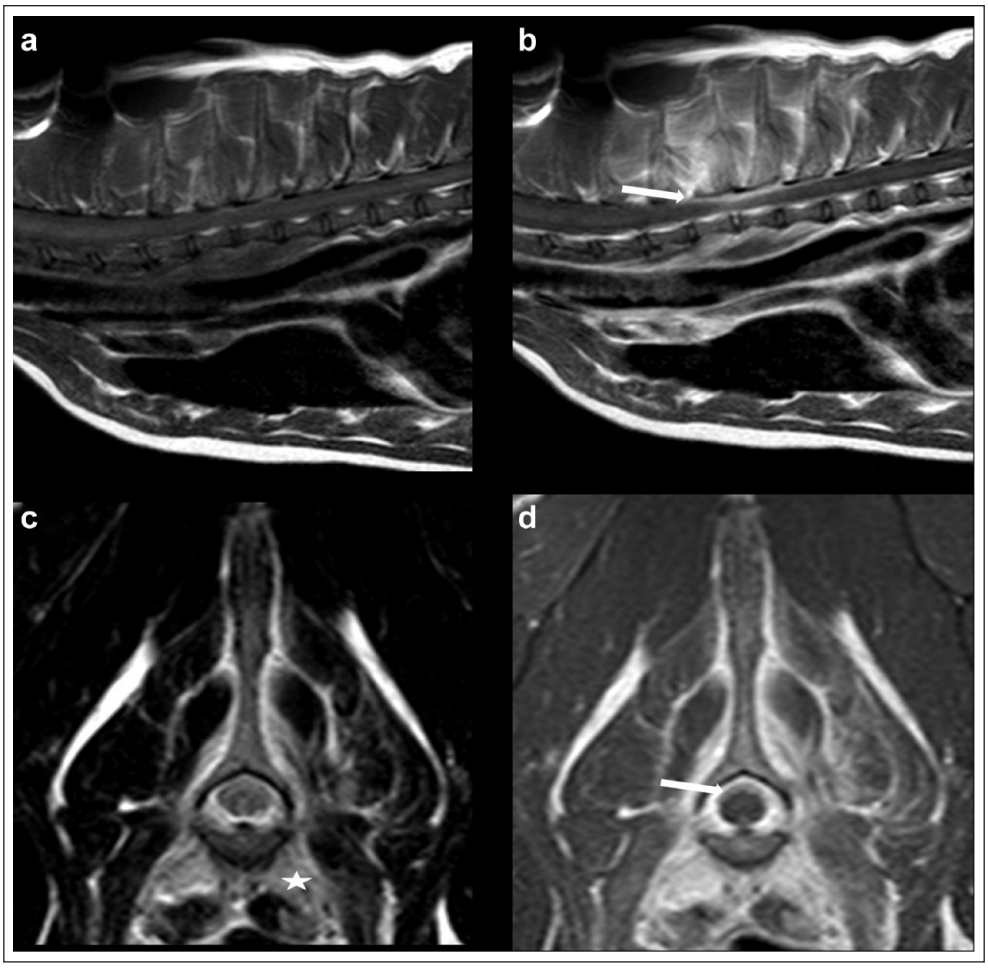

Figure 2 MRI examination results for case 13 that presented for a sudden onset of pelvic limb weakness that worsened progressively over 2 weeks, ultimately leading to non-ambulatory paraparesis. The image comprises (a) sagittal T1W pre-contrast, (b) sagittal T1W post-contrast, (c) transverse T2W and (d) transverse T1W post-contrast sequences, demonstrating meningeal enhancement (white arrows) and increased signal intensity of the adjacent muscles (star). The final diagnosis in this case was feline infectious peritonitis (FIP). T1W = T1-weighted; T2W = T2-weighted

compared with that in this study (7.3 years). The study by Gillespie and De Decker[8] also reported a higher incidence of thoracic canal stenosis in the cranial thoracic region, more specifically at T3–T4 and T4–T5.

Degenerative disorders were uncommon in this study, with IVDP diagnosed in two cats. Intervertebral disc herniation is considered less common in cats than in dogs, with a described prevalence of 0.24%[22] and a higher prevalence in purebred cats. In a recent study on a population of 43 cats,[5] intervertebral disc herniation was more prevalent in the lumbar vertebral column compared with the thoracolumbar region, with fewer cases of intervertebral disc extrusion cranial to the T11 vertebra, making the area of interest of our study an unusual location for developing disc herniation in cats.[8]

With regard to the presentation, most of our cases presented a chronic and progressive clinical history. This is in agreement with the more common conditions diagnosed as, typically, neoplasia, and anomalies can present as chronic and progressive diseases.[2] Regarding the observation of a 'two-engine gait', this was observed in only 1/21 cats, in contrast to the 14% of dogs with a lesion in this area reported by a similar study.[17] Although the sample size is small, this suggests that this clinical sign may either be more difficult to recognise in cats, or may not be a common feature of cranial thoracic vertebral column disorders in cats, perhaps reflecting their lighter body weight or other anatomical differences between species. Related to this, the only cat with a 'two-engine gait' presented a solitary lesion at the level of the T1 vertebral body. Owing to the anatomical discrepancy between the number of cervical spinal cord segments and cervical vertebrae, meaning that the eighth cervical spinal nerve leaves cranial to the first thoracic vertebra, and also the anatomical location of the T1 and T2 spinal cord segments at the level of the T1 vertebral body,[23] this is likely

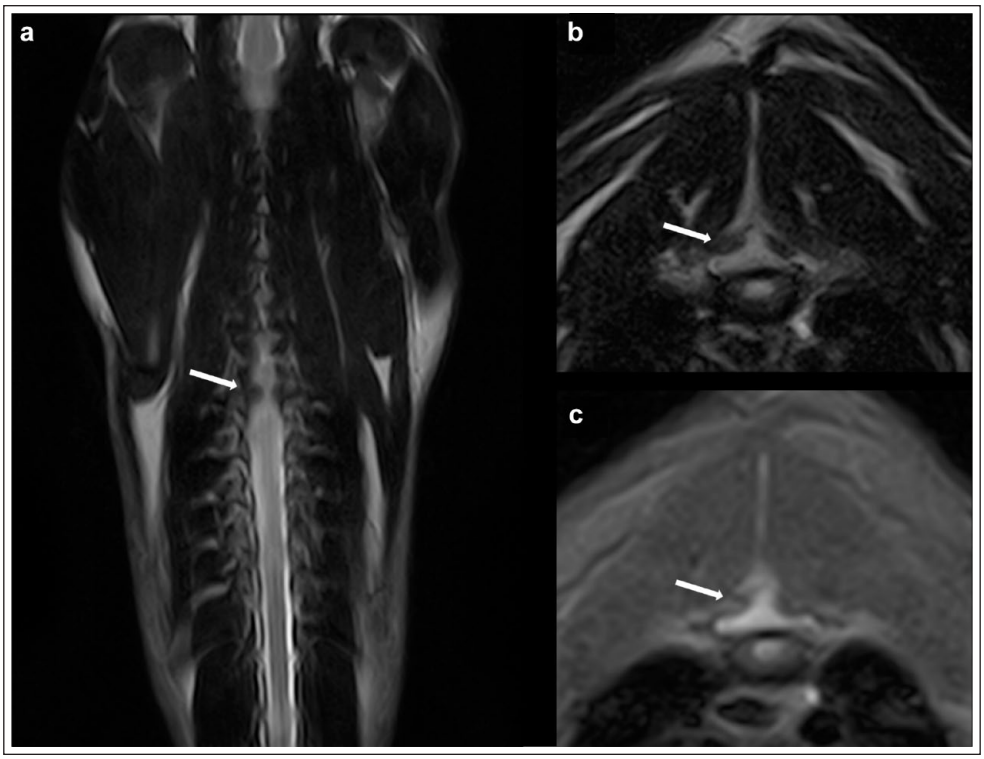

Figure 3 MRI scans of case 2 that presented for progressive pelvic limb weakness over a period of 3 weeks, eventually resulting in non-ambulatory paraparesis. The images include (a) dorsal T2W, (b) transverse T2W and (c) transverse STIR sequences, indicating bilateral articular facet hypertrophy at the T5-T6 level, leading to severe spinal cord compression (arrow). This was confirmed during the intraoperative assessment. STIR = short tau inversion recovery; T2W = T2-weighted

to explain the presenting clinical signs in this patient, and means that a lesion caudal to the T1 vertebral body is less likely to present with thoracic limb abnormalities. This is supported by the fact that only one cat had a C6–T2 spinal cord neurolocalisation in this study, while six cats had focal lesions identified at the T1–T3 vertebrae.

A potentially useful part of the neurological examination, which could easily help the clinician to localise a lesion in the cranial thoracic region, is the CTR. In this pathway, the ascending afferent pathway courses rostrally through the ipsilateral thoracic spinal cord to synapse bilaterally with the efferent motor neuron cell bodies at the C8–T1 spinal cord segments.[23] However, despite the close relationship of this pathway with the cranial thoracic spinal cord, only 6/21 of the cases showed CTR abnormalities, five of which were completely absent rather than representing a distinct level of interruption to guide an accurate neuroanatomic localisation. This likely reflects the inconsistency of this test in cats and may limit its use for identifying thoracic myelopathies in this species compared with dogs.[24,25]

The present study has some limitations, many of them due to its retrospective nature. The high frequency of neoplasia compared with inflammatory conditions could be explained due to the narrow section of the spinal cord that was focused on, which might bias the study for more focal myelopathies against multifocal or more diffuse processes. This could have skewed the results in favour of certain disease categories, particularly as the more common spinal cord diseases reported in previous feline studies may most likely present with multifocal signs (ie, FIP, lymphoma). Another limitation could be the lack of histopathological confirmation in some cases which, as mentioned before, could have led to misdiagnosis. The small number of cats included in the study also limits the application of this result, so a larger study could be necessary in the future. The last limitation, which derives directly from the retrospective nature of this study, is the classification of the onset (acute vs chronic) in each case as this was based on the available information from the clinical notes of each specific clinician, making this information potentially ambiguous; therefore, it should be interpreted with caution.

Conclusions

To the authors' knowledge, this is the first study describing the most common signalment, onset and progression, clinical findings and diagnoses of cats with spinal cord lesions in the cranial thoracic region (T1–T6 vertebral column). The present study found neoplasia to be the most common cause, followed by inflammatory and anomalous conditions. No individual clinical features

Table 1 Signalment, onset, progression, clinical signs progresion, neurological localization, neurological findings, lesion location and diseases category of the 21 cases matching the inclusion criteria

Case number	Breed	Sex	Age at diagnosis (months)	Weight (kg)	Onset	Progression	Duration of clinical signs (days)	Neurolocasitation (before imaging)	Ambulatory	Ataxia	CTMR abnormality	CTMR cut-off	Asymmetric signs	Side	Incontinence	Horner syndrome	Short-strided thoracic limb gait	Spinal pain	Lesion location (extradural/ intradural-extramedullary/ intramedullary)	Site	Disease category (VITAMIN-D)
1	DSH	MN	93	4.8	Chronic	Progressive	28	T3–L3	No	No	Yes	Absent	Yes	Left	Yes	No	No	Yes	Extradural	T5–T6	Neoplasia
2	DSH	ME	5	1.8	Chronic	Progressive	21	T3–L3	No	Yes	Yes	T6	Yes	Right	No	No	No	No	Extradural	T5–T6	Anomalous
3	DSH	MN	60	5.4	Chronic	Progressive	30	T3–L3	No	No	Yes	Absent	Yes	Left	No	No	No	No	Extradural	T3–T4	Degenerative
4	DLH	FN	192	4.8	Chronic	Progressive	2880	T3–L3	Yes	Yes	No	Present	No	NA	Yes	No	No	No	Intradural-extramedullary	T3–T4	Anomalous
5	DSH	FN	72	4.5	Chronic	Progressive	30	T3–L3	Yes	Yes	No	Present	Yes	Left	No	No	No	Yes	Extradural	T5–T6	Anomalous
6	DSH	MN	54	5	Chronic	Progressive	30	T3–L3	Yes	Yes	No	Present	Yes	Left	No	No	No	No	Intradural-extramedullary	T3–T4	Neoplasia
7	DSH	MN	129	5.1	Chronic	Progressive	30	C6–T2	Yes	Yes	No	Present	No	NA	No	No	Yes	Yes	Extradural	T1	Neoplasia
8	DSH	FN	110		Chronic	Progressive	180	T3–L3	Yes	Yes	Yes	Absent	Yes	Left	No	No	No	No	Extradural	T2	Neoplasia
9	DSH	FN	129	4	Acute	Progressive	7	T3–L3	No	No	No	Present	No	NA	Yes	No	No	No	Extradural	T2–T3	Neoplasia
10	DSH	MN	54		Chronic	Progressive		T3–L3	Yes	Yes	No	Present	Yes	Left	No	No	No	No	Intradural-extramedullary	T3–T4	Neoplasia
11	DSH	ME	103	7.9	Chronic	Progressive	84	T3–L3	Yes	Yes	Yes	Absent	No	NA	No	No	No	Yes	Extradural	T4–T5	Anomalous
12	DSH	FN	113	3.13	Acute	Progressive improvement	15	T3–L3	Yes	Yes	No	Present	Yes	Left	No	No	No	No	Extradural	T3–T4	Degenerative
13	Maine Coon	FN	90	5	Acute	Progressive	7	T3–L3	No	No	Yes	Absent	No	NA	No	No	No	No	Intramedullary	T1 and T6	Inflammatory (immune-mediated/ infectious)
14	Birman	MN	8	2.17	Chronic	Progressive	28	T3–L3	Yes	Yes	No	Present	No	NA	Yes	No	No	No	Intramedullary	T1–T2	Inflammatory (immune-mediated/ infectious)
15	Persian	MN	80	3.55	Acute	Non-progressive	1	T3–L3	Yes	Yes	No	Present	No	NA	No	No	No	No	Intramedullary	T2–T3	Vascular
16	DSH	MN	173	5	Chronic	Progressive	56	T3–L3	Yes	Yes	No	Present	Yes	Right	No	No	No	No	Intramedullary	T1 and T6	Inflammatory (immune-mediated/ infectious)
17	DSH	MN	66	5.9	Chronic	Progressive	14	T3–L3	Yes	Yes	No	Present	Yes	Left	No	No	No	Yes	Intradural-extramedullary	T5–T6	Neoplasia
18	DLH	MN	117	3.28	Acute	Progressive	4	T3–L3	No	No	No	Present	Yes	Left	No	No	No	No	Intramedullary	T2–T6	Inflammatory (immune-mediated/ infectious)
19	DSH	MN	163	4.75	Chronic	Progressive	14	T3–L3	No	No	No	Present	No	NA	No	No	No	No	Extradural	T3–T5	Neoplasia
20	DLH	FN	156	4.3	Chronic	Progressive	30	T3–L3	Yes	Yes	No	Present	No	NA	No	No	No	No	Intramedullary	T3–T4	Neoplasia
21	DSH	FN	10	3.12	Chronic	Non-progressive	30	Multifocal	Yes	No	No	Present	No	NA	No	No	No	Yes	Extradural	T2	Inflammatory (immune-mediated/ infectious)

CTMR = cutaneous trunci muscle reflex; DLH = domestic longhair; DSH = domestic shorthair; FN = female neutered; ME = male entire; MN = male neutered; NA = not applicable

that specifically point to this lesion location were found, stressing the importance of imaging the full extension of the T3–L3 spinal cord segments, up to and including at least the T1 vertebra, in cats presenting with clinical signs indicative of a T3–L3 myelopathy.

Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval The work described in this manuscript involved the use of non-experimental (owned or unowned) animals and procedures that differed from established internationally recognised high standards ('best practice') of veterinary clinical care for the individual patient. The study therefore had prior ethical approval from an established (or ad hoc) committee as stated in the manuscript.

Informed consent Informed consent (verbal or written) was obtained from the owner or legal custodian of all animal(s) described in this work (experimental or non-experimental animals, including cadavers) for all procedure(s) undertaken (prospective or retrospective studies). No animals or people are identifiable within this publication, and therefore additional informed consent for publication was not required.

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