Spinal dysplasia with stump tail and hind limb paralysis in a laboratory bred cat

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Summary

A case is presented of a specified pathogen free bred cat which was apparently tail-less at birth and at three weeks of age revealed hind limb paralysis. The animal was euthanized at 4 weeks and X-radiography revealed an abnormal spinal curvature, greatly reduced caudal vertebrae and abnormal pelvic development. A small tail was dissected at post-mortem, but other abnormalities were not seen.

Keywords: Spinal dysplasia; Cat

Congenital abnormality occurs to a greater or lesser extent in all species. It may result from maternal infection, nutritional deficiency, drugs, environmental substances or genetical causes (Lansdown, 1983; 1988). Whereas spontaneous abnormalities common to rabbits, rats and mice as used in reproductive and teratological studies are well documented, less is published on other laboratory species like the cat. We wish to record here an interesting case of spinal deformity in a cat bred in our high quality specified pathogen free (SPF) colony.

Case report

The present abnormality was identified in a three week old female cat of a short-haired variety bred in our laboratory at the Charing Cross & Westminster Medical School. The SPF colony maintained under conditions of 22 ± 2 °C, 50% relative humidity and 12 h:12 h light dark cycles has been in existence for approximately 12 years and is derived from animals supplied by Hillgrove Family Farm Ltd (Whitney, Oxfordshire, UK). The animal was from a litter of four born to a 4-year-old multiparous queen. Pregnancy was uneventful and the queen remained in good condition throughout. The deformed kitten was smaller than its litter mates and showed locomotive difficulties. It moved by its front legs, tending to drag its hind limbs in a supine position. It weighed 250 g. It was observed for a further 7 days, and as its condition showed no obvious improvement, the cat was euthanized using a single intravenous injection of pentobarbitone sodium (1 ml/kg body weight; Expiral; Sanofi Animal Health). The litter mates were normally developed.

X-radiographic examination revealed a pronounced curvature in the region of the lumbar spine (L 5–8) (Fig. 1). A greatly reduced or stump tail was identified consisting of 3 minimally ossified vertebrae. The pelvic girdle was also reduced in size for the age of the cat, and exhibited underdevelopment especially in the region of the acetabulum (Fig. 2). The head and neck of the femurs were correspondingly retarded. A small tail (1 cm long) was dissected from the subcutaneous tissue. Other abnormalities were not identified at post-mortem examination. No histopathology was conducted and the condition of the posterior spinal cord is not known.

Discussion

Development in any species depends upon the growth potential of an individual and its ability to cope with environmental circumstances.
Deformity, when it occurs, reflects an abnormal interaction between the genotype and its local environment (Lansdown, 1988). As far as we are aware, there is no genetical predisposition towards spinal deformity or tail-lessness in our strain of cats, this being the first animal to show the condition in several hundred deliveries. Environmental conditions have remained the same and animals have been fed a standard diet of Kit-e-Kat (Pedigree Pet Foods, UK) throughout.

Tail-lessness is a feature of Manx cats, and these have been studied genetically. Kerruish (1964), for example, found that quite a high proportion of true Manx cats had symptoms indicating a lack of control over hind limb movement, whereas animals with ‘stumpy’ tail did not. Kerruish reported a correlation between tail-lessness in Manx cats with aberrant hind limb movement and a hollow at the base of the spine. To what extent this hollow correlated with the abnormal spinal curvature seen in the present study is not known. It is tempting to speculate that the deformities in our cat were associated with damage to the spinal cord. We saw no evidence of spina bifida as has been reported previously in Manx cats (Robinson, 1959; Todd, 1964), or obvious dysfunction in urination or defaecation which might suggest spinal cord involvement. We conclude that the abnormality in our cat possibly developed through a prenatal injury to the lower lumbar region occurring in mid to late pregnancy resulting in aberrant skeletal or muscular growth, the nature of the injury is not known.

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References
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