Calling time on Scottish Folds

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Introduction

The National Animal Welfare Advisory Committee (NAWAC) released their "Opinion on Animal Welfare Issues Associated with Selective Breeding" earlier this year, agreeing with the concerns raised by Companion Animal Veterinarians (CAV) on the health of Scottish fold cats. NAWAC stated in their report that the "Scottish Fold breed should be banned on welfare grounds."

History of the breed

The breed was developed in Scotland in the early 1960s from a white barn cat 'Susie', that developed a mutant gene causing folded ears (figure 1a). A breeding programme was started and the breed was registered with the Governing Council of the Cat Fancy (GCCF) in Great Britain in 1966. Along with the characteristic ear folds, the cats also typically have short legs and short thick tails (figure 1b). All Scottish Fold cats can trace their pedigree back to Susie.

In 1971, the breed was banned by the GCCF after it was discovered the same genetic defect that causes the folded ears also resulted in severe arthritis. The Federation Internationale Feline (FiFe) will also not recognise the breed.

Despite the significant welfare cost associated with crippling arthritis, the breed gained favour and continued in the United States. The breed remains popular there and around the world, particularly in Japan.

Pathophysiology

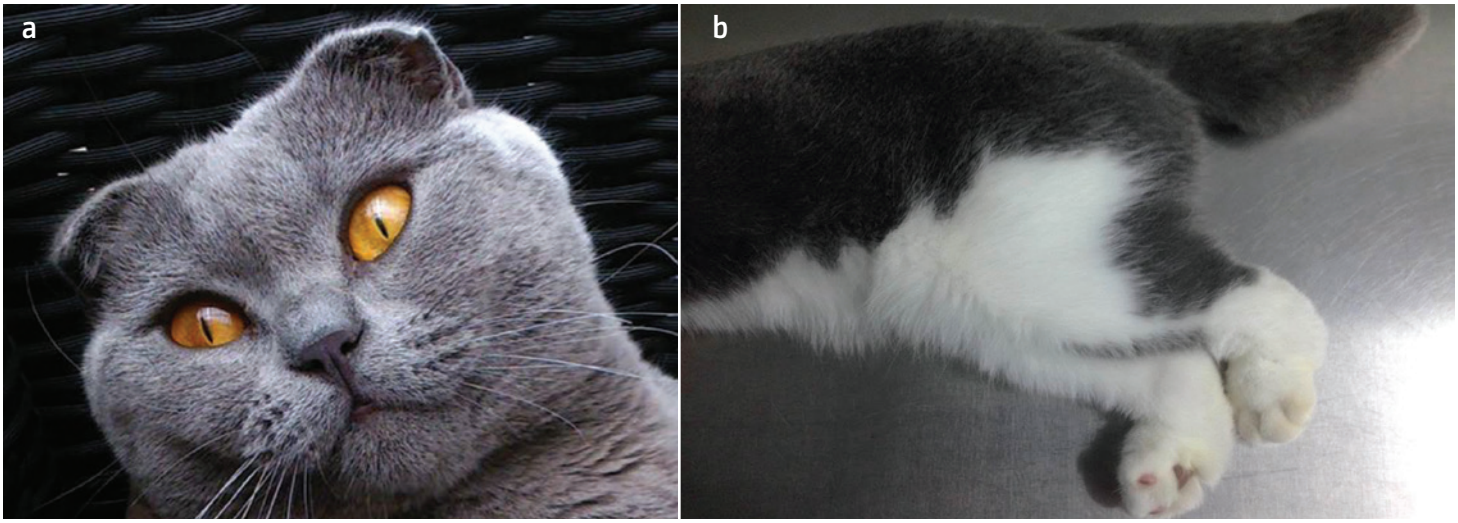
The autosomal dominant mutant gene causes osteochondrodysplasia (FOCD). This is a developmental abnormality that produces cartilage that is not strong enough to support the ear in an upright position, causing the ear to fold. The cartilage defect also affects cartilage on articular surfaces, so that a highly progressive degenerative joint disease develops.

The altered gene has been identified as TRPV4 (Gandolfi, et al. 2016), which encodes a calcium-permeable ion channel, although how the mutation in TRPV4 affects the development of cartilage is currently unknown. Histologically, death of chondrocytes within articular cartilage and defective maturation of chondrocytes in the growth plate are seen.

Defective endochrondral ossification leads to shortening and distortion of the metatarsal and metacarpal bones. It is also accompanied by progressive periarticular new bone formation and accelerated degenerative joint disease.

In homozygous cats, the condition leads to limb deformity and degenerative joint

Figure 1: Photographs of Scottish Fold cats showing (a) the folded ears and b) the short legs and short thick tail typical of the breed. Photo credit: Pixabay.com and R. Malik.



disease, often evident on radiographs from seven weeks of age. The subsequent disability and chronic pain markedly impacts quality of life and frequently leads to euthanasia at an early age.

While it was originally thought that arthritis and degenerative joint disease were restricted to homozygous animals, more recent studies have found that all Scottish Folds, including heterozygotes, have some degree of FOCD as determined by radiographically visible bone changes (Malik et al. 1999; Chang et al. 2007; Takanosu et al. 2008). Logically, this is not surprising. If the defective cartilage is unable to support the weight of the pinna, it appears unlikely to be strong enough to have normal function when lining a joint.

Heterozygotes do, however, exhibit variable clinical signs. Malik et al. (1999) describe the case histories of ten heterozygote cats, showing that while some were severely affected as to require euthanasia before two years of age, others were apparently clinically asymptomatic at four, five, and eleven years old.

Diagnosis

A diagnosis of FOCD is suspected based on breed, pedigree and the following, clinical signs:

- lameness
- reluctance to jump
- stiff, stilted gait
- short, misshapen distal limbs
- swelling of plantar tarsometatarsal regions
- short, thick inflexible tail

FOCD is confirmed by characteristic radiological findings (figure 2) which include irregular shape and size of tarsal, carpal, metatarsal and metacarpal bones, phalanges and caudal vertebrae, narrowed joint spaces and progressive new bone formation around joints of distal limbs.

Treatment

FOCD is an incurable progressive disease. Therapy is supportive, consistent with other degenerative joint disease protocols.

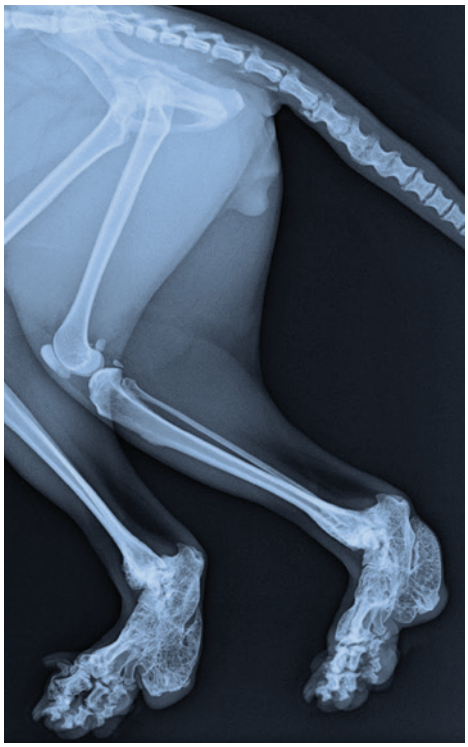
The mainstay of management is non-steroidal antiinflammatories, supported by weight management, and environmental modification (soft bed, ramps). Other therapies such as pentosan polysulphate, omega-3 supplements, other neutraceuticals and physiotherapy have been suggested, but are currently unproven.

In the past a variety of approaches have been used for severely affected individuals, including ostectomy of tarsal exostoses, pantarsal arthrodesis and radiation therapy, with limited success. Autologous stem cell therapy has been suggested as a treatment but it is currently unknown if this is beneficial. Euthanasia is often required at an early age.

Heterozygote controversy

In discussing this breed with New Zealand Cat Fancy (NZCF), it is well accepted by breeders that they should avoid breeding homozygous Scottish Folds. Breeders do, however, debate the degree to which heterozygous cats are affected by FOCD, whether all heterozygotes are affected, and if by breeding less affected cats together the problems may reduce over time.

Figure 2: Lateral radiographic view of the hindlimbs and tail of a Scottish Fold cat showing severe FOCD. Note the irregular shape and size of tarsal, metatarsal bones and phalanges, narrowed joint spaces, and progressive new bone formation around the joints of the distal limbs and tail, including marked tarsal exostoses. Photo credit: R. Malik.



However, even in the most responsible breeding programs, it is unavoidable that progeny with FOCD will be produced and will suffer from crippling arthritis. CAV do not accept that this "collateral damage" is a reasonable approach to manage cat welfare.

NZCF have considered de-registering the breed outright, but have instead opted for a testing and management proposal. They have drafted a policy, that is yet to be implemented, that recommends:

- Annual examinations including x-rays and examination for any evidence of lameness, stiffness or pain and with those affected not used for breeding and desexed.
- DNA tests to ensure no fold-to-fold matings are inadvertently taking place because of the variable expression of the actual ear folding. Cats with two copies of the mutation to be desexed.
- All breeding cats microchipped for tracking of testing. Identity certified by the veterinarian doing testing (including DNA tests).
- Pet owners purchasing kittens must agree to allow NZCF or other researchers to contact them periodically with regards the health of their cat.
- Review of this policy in association with the data provided from breeders in five years' time.

It is likely that once implemented, these requirements will be a mandatory requirement to register a kitten. It is concerning however that this work has yet to have any date set for implementation.

The reluctance by NZCF to de-register the breed is, in part, due to the ability of breeders to continue breeding Scottish Folds outside the confines of NZCF. There is an alternative cat pedigree register in New Zealand, Catz Inc, which will register the Scottish Fold (along with the newly introduced Munchkin cat breed, which NZCF refuses to recognise due to welfare concerns). NZCF believe that until there is a government-backed mechanism to ban a breed, the best welfare protection they can afford Scottish Fold cats is to have them bred in accordance with NZCF rules (once they are implemented).

CAV breeding recommendations

CAV believes that breeding cats for a certain look when aware of the substantial

risks that many cats will develop a painful, untreatable disease, is unethical and to the detriment of animal welfare.

Since FOCD is a highly penetrant genetic disease frequently leading to chronic pain and reduced quality of life, for ethical and welfare reasons, all cats carrying this mutation should not be bred.

This welfare issue is quite different to those seen in brachycephalics which have received a lot of attention recently. Because this problem is associated with a single gene that can be simply eliminated within one generation, CAV recommends that Ministry for Primary Industries (MPI) implement an animal welfare regulation to ban the breeding of Scottish Folds in New Zealand. A similar ban already exists in the state of Victoria in Australia.

CAV calls for all Scottish Fold breeders to move instead to the Scottish shorthair. This breed has the same breed characteristics as the Scottish Fold but without the crippling genetic mutation and folded ears.

"There exists sufficient information to know that breeding these cats is cruel… vets and cat breeders who condone this practice have no scientific basis with which to defend this practice. They are not breeding cats – they are perpetuating a disease state" (Malik 2016).

References

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