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Guest Editorial

The dilemma of when to neuter

The neutering of female dogs (spaying) is a common practice in many countries as a means of canine population control. Additional benefits have been reported, including a decreased risk of mammary cancer (Schneider et al., 1969) and the self-evident removal of the risk of pyometra. However, the practice also is reported to have disadvantages, such as an increased risk of cystitis (Spain et al., 2004), aggression (O'Farrell and Peachy, 1990) and, notably, urinary sphincter mechanism incompetence, leading to urinary incontinence (Thrusfield, 1985; Holt and Thrusfield, 1993; Thrusfield et al., 1998). The increased risk of incontinence has been estimated at nearly eightfold (95% confidence interval [CI] for the relative risk: 2.6, 31.5) compared with entire bitches (Thrusfield et al., 1998), which is far from trivial considering that the reported incidence of incontinence in neutered bitches is 5–20% compared with <1% in entire females (Arnold et al., 1989; Thrusfield et al., 1998).

If neutering is practised, there is choice over when the procedure is undertaken. Early neutering (neutering before first oestrus: under approximately 6 months of age) has distinct advantages. When undertaken at 7 weeks of age, there is more rapid recovery from anaesthetics, and fewer postoperative complications than when conducted at 7 months of age (Howe, 1997). When compared with entire females, the risk of mammary neoplasia is reduced to 0.05% if neutering is undertaken before the first oestrus, 8% when performed between the first and second oestrus, and 26% when conducted after the second oestrus (Schneider et al., 1969). Small reductions in the risk of obesity and some adverse behavioural traits in females neutered early have also been reported (Spain et al., 2004). Early neutering also increases the number of neutered animals in dog homes (shelters), therefore increasing the number of animals that are adopted and reducing the number that need to be euthanased (Lieberman, 1987). Moreover, there is the demographic benefit of removing the potential for breeding in animals adopted from dog homes.

However, early neutering is not without its disadvantages. The retrospective cohort study of Spain and colleagues (2004), involving 1842 dogs of which 983 were female, revealed a moderately increased risk of cystitis in early-neutered relative to late-neutered females (relative risk: 2.76; 95% CI: 1.08, 7.14), and a small increased risk of hip dysplasia in all dogs (relative risk: 1.70; 95% CI: 1.04, 2.78). A similar increased risk of urinary incontinence in females neutered early was also identified (relative risk: 1.20; 95% CI: 1.06, 1.35). This is consistent with the findings of the prospective cohort study of Thrusfield et al. (1998) on 809 bitches, which suggested a 56% chance of a twofold increase in risk of

incontinence in early-neutered versus late-neutered animals (relative risk, adjusted for potential confounding by cervical removal: 3.9; 95% CI: 0.8, 10.4; significant at the 10.2% level).

de Blesser and colleagues (2011), in a study published in this issue of *The Veterinary Journal*, explored the association between early neutering and other potential risk factors, and incontinence, in a case-control study of 370 spayed bitches, undertaken in the Greater London area and using data obtained by questionnaire from registered veterinary practices. Evidence for a relationship between early neutering and incontinence was less convincing than in other studies, with significance only demonstrated at the 14.3% level in relation to bitches spayed before 6 months of age, and 14.6% in relation to bitches spayed before the first oestrus, although this may be partly explained by the relatively small sample size. A stronger relationship was found between tail docking and incontinence (odds ratio: 3.86; 95% CI: 2.08, 7.20), which squares with the results of Holt and Thrusfield (1993) and provides valuable evidence to the notoriously uninformed docking debate (Bennet and Perini, 2003). The authors also demonstrated an increased risk in heavy dogs, but echo the conclusions of other investigators in finding the precise causal mechanisms associated with weight and docking difficult to elucidate.

The article by de Blesser et al. (2011) provides a valuable contribution to the early-neutering debate, which up to now has been frequently characterised by perceptions, rather than evidence-based medicine (Spain et al., 2002).

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