

Twins in the bitch

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Introduction

Despite occasional, anecdotal reports of two pups delivered within, or followed by, a single placental sac, few cases of sharing of placental sites have been formally documented in the dog. A case report from 1946 describes the finding of two canine embryos within one placental site. Although the embryos had separate amniotic and allantoic sacs, their sharing of a single chorion and yolk sac led the author to speculate that they may have been of monozygotic origin¹. More recently, Urhausen C, K Wolf² detected two foetuses within one placental site during ultrasonographic examination of a German Shepherd bitch. On a follow-up examination, the foetuses were found to be non-viable and were removed by caesarean section. The foetuses were of discordant gender, excluding the possibility of their monozygotic origin. This report describes two recently published case reports of dog foetal pairs within single placental sites, one involving suspected freemartinism of a female foetus paired with a male (Case One; Joonè CJ, KGM De Cramer³) and the second involving two male foetuses of monozygotic origin (Case Two; Joonè C, K De Cramer⁴).

Case One

A two year old, primiparous Boerboel bitch underwent an elective caesarean section at a veterinary facility, following detection of the onset of stage one of labour. Eleven live pups and four non-viable foetuses were delivered in total. Two of the non-viable foetuses were found to share a single placenta. These foetuses were of discordant genders, with apparently normal external genitalia. Genetic profiling of blood samples from the two foetuses, taken by cardiac puncture with due care to avoid cross-contamination, revealed identical DNA profiles. However, five loci were found to show three alleles, with one locus showing four alleles, suggesting the superimposition of more than one genetic profile. Profiling of myocardial tissue samples from the two foetuses revealed unique DNA profiles, with no more than two alleles at each locus. Combined, the two profiles generated from the myocardial tissues matched the single profile generated from the blood samples. The internal reproductive tracts of the two foetuses were examined macroscopically and histologically. The male foetus possessed two testes, located immediately caudal to the kidneys. The female foetus showed no macroscopically discernible uterus or ovaries. A small section of ovarian tissue was detected on histopathology of tissues associated with the caudal pole of the female's left kidney. Furthermore, the vagina was found to be markedly smaller than that of a control foetus. The findings of a hypoplastic internal reproductive tract suggested freemartinism of the female foetus, a syndrome not previously reported in this species.

Case Two

A three year old, multiparous Irish wolfhound underwent an emergency caesarean section at a veterinary facility. During surgery, an enlargement of the base of one of the uterine horns was noticed. Following incision of the uterus, the surgeon delivered a live male pup from the affected horn, followed immediately by a second live male pup found to be within the same placental site as the first pup. The two pups' umbilical cords attached to a single placenta. Five more live pups were delivered. Genetic profiling of both blood and tissue (buccal swab) samples from the two pups found within one placental site, using an extensive panel of 40 short tandem repeat loci, revealed identical genetic profiles. The pups were successfully weaned from their dam at the age of nine weeks and rehomed. Although remarkably similar in appearance, small differences in the white markings on the pups' chests, paws and tail tips were evident.

Conclusion

Both of the above cases were detected by a specialist theriogenologist highly active in dog reproduction in private practice. This suggests that knowledge of the potential for sharing of placental sites favours its detection. Moreover, this phenomenon may not be as rare as originally presumed in this species. It is hoped that similar findings will be reported in the near future as a result of increased awareness among veterinarians. Moreover, the suspected freemartinism reported in Case One is currently of unknown significance. Given that the pups in Case Two were delivered alive and vigorous, sharing of a placental site is not incompatible with survival to term. Thus, the detection of a surviving freemartin in this species, if indeed they do exist, would be of interest.

References

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