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A non-surgical uterine lavage technique in large cats intended for treatment of uterine infection-induced infertility

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Abstract

This paper presents the successful use of a non-surgical, transcervical uterine lavage technique for the treatment of uterine infection-induced infertility in three female large cats. We developed a non-surgical uterine lavage technique, which allowed repeated flushing of the uterine lumen and installation of therapeutic antibiotics. The entire procedure was performed under general anaesthesia (duration of anesthesia ranged from 40 to 70 min). It was successfully applied in a Sumatran tiger (*Panthera tigris sumatrae*), a Corbett tiger (*Panthera tigris corbetti*) and an Amur leopard (*Panthera pardus orientalis*). The tigers were treated only once, whereas the leopard received four uterine treatments, due to re-infection after mating. Decisions to conduct uterine treatments were based on detection of uterine fluid during previous transrectal ultrasound examinations. The catheter was guided into the vagina, with the aid of an endoscope, passing the urethra, and then into the uterus, with the aid of transrectal ultrasonography. Both uterine horns were separately flushed with approximately 300 mL of cell medium M199, followed by an antibiotic infusion. Upon ultrasonographic re-examination, the topical uterine treatments resulted in an apparent decline in the inflammatory and/or degenerative processes. The Corbett tiger had the most severe uterine alterations, in addition to an aseptic pyometra. As a result, she was treated 1 month prior to ovariohysterectomy (in order to reduce the surgical risk). The Sumatran tiger was artificially inseminated twice after hormone-induced estrus, and the Amur leopard expressed a spontaneous estrus and re-initiated mating behaviour.

Keywords: Uterine treatment; Pyometra; Infertility; Cervical dilatation; Felid

1. Introduction

Among the 37 felid species, only the domestic cat (*Felis catus*) is not at risk of extinction [1]. The primary threat is habitat loss due to conversion of land into agriculture and urban areas. In some Asian countries, the use of bones for traditional medicine has also severely impacted wild populations of felids. Although the death rate exceeds the natural background rate, the birth rate is lower than natural background rates. Because of this fragile status, reproduction is essential to species survival, as well as the maintenance of genetic diversity. The first step to ensuring species survival is a better understanding of reproductive biology—thus captive breeding programs are the essence of species survival. In fact, ''the development and use of technology that solves reproductive and infertility problems'' has been a high-priority focus point of the 3-year-plan of American Zoological Association Felid Taxonomy Advisory Group since 1995.

Captive breeding programmes for endangered felid species must overcome several obstacles. In addition to

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Table 1
Felid species subjected to reproductive assessment and treatment

Species/subspecies	Number of females examined	Number of females with a reproductive disorder	Number of females treated
Indian tiger (*Panthera tigris tigris*)	2	–	–
Corbett tiger (*Panthera tigris corbetti*)	1	1	1
Sibirian tiger (*Panthera tigris altaica*)	8	2	–
Sumatran tiger (*Panthera tigris sumatrae*)	6	1	1
African lion (*Panthera leo*)	15	2	–
Indian lion (*Panthera leo goojratensis*)	2	–	–
Amur leopard (*Panthera pardus orientalis*)	5	2	1
Persian leopard (*Panthera pardus dathei*)	1	–	–
Snow leopard (*Unica unica*)	2	–	–
Jaguar (*Panthera onca*)	3	–	–
Cougar (*Puma concolor*)	3	1	–
Cheetah (*Acinonyx jubatus*)	18	3	–
Total	66	12 (18.4%)	3 (4.5%)

the limited number of potential breeding partners, many of the competent breeders have developed social incompatibility problems [2]. Our results indicated that reproductive disorders in female felids might cause such pair incompatibility, due to hormonal changes that result in decreased receptiveness and libido. Many of the captive female felids are considered reproductively unfit due to severe pathology. From more than 60 ultrasonographic reproductive assessments of female large cats, derived from 12 different species/subspecies (Table 1), we found uterine pathology in approximately 18% of the females evaluated in this study, ranging from small endometrial cyst accumulation (Fig. 1A) to severe alterations such as pyometra, sometimes combined with

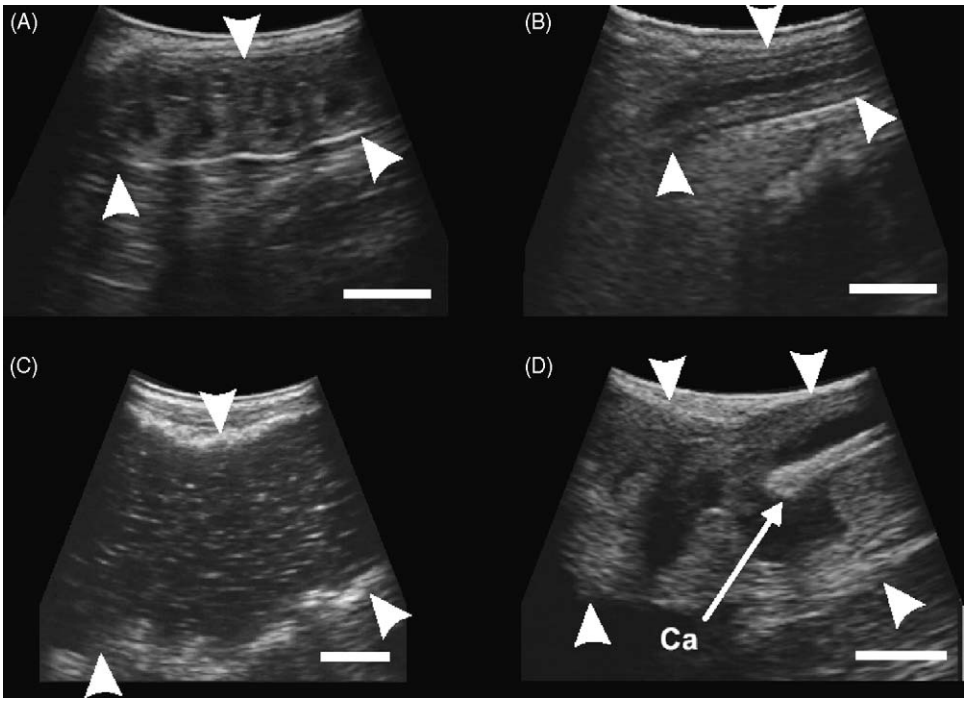

Fig. 1. Sonograms (7.5 MHz) of the uteri (border marked with white arrowheads) of various large cats with uterine pathology, subjected to a uterine flushing procedure. (A) Cystic endometrium in the uterus of an African lioness, following contraception with MGA for 2 years. (B) Fluid accumulation in the uterus of a Sumatran tiger, prior to uterine lavage. (C) Pyometra in a Corbett tiger prior to treatment; note the characteristic snowflake-like appearance of the uterine content. (D) Uterus of an Amur leopard; note the catheter (Ca) surrounded by the anechoic flushing medium (M199). All white bars = 1 cm.