

SPLIT PARTURITION IN A BLACK BEAR

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Abstract: A 3-year-old black bear (*Ursus americanus*) captured following initiation of pregnancy was held in captivity from August 1990 through April 1991. Ultrasonic imaging in January 1991 indicated the presence of 3 fetuses. A single fetus was born dead on 12–13 January 1991, and a scat recovered on 10 January 1991 yielded 8 fetal bear claws that were smaller than those of the newborn fetus. It was concluded that a split parturition had occurred in this bear, an event which occurs rarely in any mammal species.

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Bears have complex reproductive patterns to cope with vagaries of their lives. Black bears exemplify this. They breed in mid-summer, although implantation is delayed. During hibernation, the embryos are reactivated (in early December) and implanted. Black bears give birth during hibernation to young of very limited development. The young nurse during hibernation, and when the sows later leave their dens to resume feeding, the cubs are relatively well-developed. The next set of cubs is typically not produced for at least 2 years. Black bears seem to exercise considerable control of their reproduction by activating hormone production from the corpora lutea prior to implantation (Hellgren 1988, Hellgren et al. 1990a), possibly related to nutritional condition and maternal well-being in that not all females with corpora lutea and progesterone production implant young successfully. Because of the altricial nature of cubs, reproductive effort may be subject to substantial pre- and peripartum loss. We describe of an unusual parturition in a black bear where the individual fetuses were delivered at apparently different stages of development.

METHODS

A 3-year-old black bear captured from the wild in August 1990 was held captive until April 1991 in a corncrib type cage. The bear was part of a study of embryo implantation and of hibernation and was subjected to routine blood collection and was observed daily (see Hellgren et al. 1990b). The bear was presumed to have been bred in the wild as she had achieved puberty and was not lactating at capture. At 10-day intervals, the bear was immobilized for examination. These examinations included ultrasonic imaging of the reproductive tract (Beal et al. 1992) with an Aloka 500V ultrasound 5 MHz linear trans-

ducer (Aloka Co. Ltd., Wallingford, Conn.) and visual inspection of external reproductive organs and related phenomena. Scats were recovered and examined.

RESULTS AND DISCUSSION

During ultrasonic imaging on 2 January 1991, 3 fetuses were recognized. Two appeared to be developing normally while the third was considered to be resorbing. A single dead newborn was recovered from the pen on 14 January. This newborn seemed appropriately developed for a newborn and had the placenta still attached. We assumed it was born during the night of 12–13 January. A scat produced by the mother bear was found in the pen on 10 January. Detailed examination of this scat revealed 8 claws from 1 or more fetal bears. The recovered claws were considerably smaller than those of the bear fetus delivered on 12–13 January.

These events suggest that the bear aborted part of the conceptus prior to term and consumed the fetuses. The remaining fetus was delivered at term but did not survive. The result was a form of divided parturition which has been referred to as split parturition. The phenomenon has been recorded in several species which lent themselves more readily to observation (reviewed by Vanderplassche 1969). Vanderplassche (1969) provided physiological explanations for the occurrence of split parturition in the instances he examined. He documented split parturition in domestic swine (Vanderplassche 1969) following single matings in some instances and following matings at separate estrous periods. Following single matings, split parturition was associated with an abnormally high number of fetuses, some of which implanted late, developed fully, and were delivered after the initial litter delivered at term. The cases involving multiple

breedings of successive estrous cycles were considered to be associated with superfetation (later implantation of a second set of embryos resulting from second mating; Vanderplassche [1969]).

Cattle and sheep with split parturition have been documented to have both superfetation and possibly diapause (delayed development and implantation of individuals of the conceptus; reviewed by Vanderplassche [1969], Scanlon [1972]). Divided parturition or superfetation has been documented in humans, rabbits, muskrats (*Ondatra zibethica*), guinea pigs (*Cavia porcellus*), mice (*Mus musculus*), and rats (*Rattus norvegicus*). European hares (*Lepus europaeus*) provide an unusual, though normal, pattern of superfetation at second and later pregnancies within the breeding season.

We knew nothing of the reproductive history of the black bear we observed before she was captured from the wild, and the unusual aspects of its pregnancy were only manifest as parturition approached. Loss of part of the conceptus to abortion, as evidenced by presence of fetal toenails in a scat voided before the apparent term birth of the other fetus, clearly suggests a split parturition, particularly as the ultrasonic evidence indicated multiple fetuses. The number of conception units (3) determined by

ultrasonic examination was not indicative of superfetation, and the fetuses probably resulted from a single conception.

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