



Rottweiler

Update

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Weighing In on the Risks & Benefits of Early Sterilization in Rottweilers

A 1-year-old Rottweiler puppy, "Kaiser," was playing rambunctiously in the backyard with another dog. Owner Janice Deojay vividly recalls Kaiser's painful cry.

"I heard him yelp," says Deojay, who breeds under the Von Janger prefix in Thompson, Pa. "I went out to the yard, and he came limping toward me."

A trip to the veterinarian determined that Kaiser had ruptured the cranial cruciate ligament (CCL) in his right hind leg. The injury was considered somewhat routine since Rottweilers and other large-breed dogs are prone to CCL ruptures. Surgery repaired the torn ligament in the dog's stifle (knee joint), and after rehabilitation, Kaiser was fine for about six months.

"Then, he blew his left rear ligament," Deojay says.

The second rupture was also considered somewhat routine since a tear in one stifle is often followed by a tear in the other ligament. At 2 years of age, the otherwise healthy Rottweiler had suffered two major orthopedic traumas. Though Deojay was unaware of a possible correlation between Kaiser's neuter surgery at 6 months of age and the CCL tears, she is now convinced that the early neuter surgery contributed to the dog's susceptibility to the injuries.

For decades, veterinarians recom-

mended neutering or spaying dogs from 6 to 9 months of age, when most dogs are considered mature and capable of breeding. Then, in 1993, the American Veterinary Medical Association passed a resolution supporting prepubertal spaying and neutering from 8 to 16 weeks of age. The intention was to promote faster recovery time, higher owner compliance and reduced pet overpopulation.

More recent research raises questions about early sterilization surgeries and suggests delaying them until a dog is 1 year of age or even as old as 6 years of age to maximize the health benefits of sex hormones. Among the research, a 2004 study conducted at Texas Tech University Health Sciences Center found that sterilized male and female dogs had a significantly higher prevalence of CCL ruptures than sexually intact dogs.

"It is important for owners to be informed and to carefully weigh the benefits and risks of spay/neuter surgeries," says C. Scott Bailey, D.V.M., DACT, assistant professor of theriogenology at North Carolina State University College of Veterinary Medicine.

"There is insufficient evidence to make a blanket statement regarding the best age to spay or neuter most breeds," he says. "It should be a decision an informed owner makes with his or her veterinarian."

Orthopedic injuries are not the only adverse health consequences associated with early neutering or spaying. According to research, other problems include increased risks for cancer, hypothyroidism, urinary incontinence and obesity, the No. 1 nutritional disorder in dogs. Among the health benefits of spaying and neutering are reduced risks of testicular and ovarian cancer and of hormone-related cancers, such as mammary cancer. The prevention of unwanted litters and pet overpopulation are the main drivers for some owners.

Growth & Development in Large Breeds

Spaying or neutering, also called gonadectomy, involves surgically removing the gonads, or sex glands. In males, the testes are removed, and in females, the ovaries. Removing these glands halts the production of sperm and eggs, making reproduction impossible. The testes and ovaries also produce hormones — estrogen in females and testosterone in males — that influence growth and development.

Rottweilers can reach puberty as early as 6 months of age, though females generally do not experience their first heat cycle until 12 to 18 months of age. The breed is not considered fully grown until 24 months of age, and not until a dog reaches matu-

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Spay-Neuter Facts to Consider

Beyond avoiding unwanted pregnancies, spay and neuter surgeries can have other benefits for dogs. More recent research has shown that early spaying and neutering can have future health risks; however, the effects differ for each dog depending on physical condition, age and other factors. The best choice for an individual dog regarding spaying and neutering should be made in concert with your veterinarian.

Among the potential benefits of early spaying or neutering are:

- Protection from hormone-related cancers, such as mammary cancer in females;
- Elimination of the risk of testicular cancer in males and ovarian cancer in females;
- Elimination of uterine disease in females;
- Fewer behavioral problems, such as aggression and roaming;

- Reduction in urine marking in males; and
- Elimination of hygienic issues experienced with females in heat.

Among the potential risks of early spaying and neutering are:

- Weight gain and obesity;
- Hypothyroidism, a disorder of the thyroid gland causing thyroid hormone deficiency and affecting metabolism;
- Orthopedic problems, including cruciate ligament rupture and hip dysplasia;
- Urinary incontinence; and
- Increased risk of cancer development.

Modified from information by the American Veterinary Medical Association (www.avma.org/animal_health/brochures/spay_neuter/spay_neuter_brochure.asp) and Vetinfo (www.vetinfo.com/dneuter.html).

Early Sterilization

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rity do the growth plates, the soft tissue at the ends of limb bones, close. These plates, which are responsible for bone growth, are replaced by solid bone as a dog matures. Before then, the plates are susceptible to injury, which is particularly problematic for large, rapidly growing dogs, like Rottweilers, which can reach 27 inches in height and weigh more than 100 pounds.

Growth-plate closure is signaled by communication between the sex hormones and other growth hormones. Without the sex hormones, growth plates may close late or incompletely, causing the bones to continue to grow. Continued growth leads to longer, heavier bones that can increase stress on joints and ligaments and can change joint anatomy, causing undesirable limb angles.

Besides the increased risk of CCL rupture noted in the Texas Tech University study, spaying and neutering before 5 ½ months of age was associated with a higher incidence of hip dysplasia. The research was published in the February 2004 issue of the *Journal of the American Veterinary Association*.

Other studies have shown that early sterilization can increase the risk of orthopedic problems, such as slipped capital femoral epiphysis in which the ball of the hip joint separates from the thighbone. Weight gain, which increases stress on bones and wears down joint cartilage, is another health risk. Early spay and neuter surgeries can also prevent peak bone density.

Sterilization Affects Life Span

Recent research on aging suggests that female Rottweilers with intact ovaries may live longer than spayed females. The study, published in *Aging Cell* in December 2009, analyzed the medical histories of 119 Rottweiler bitches that lived to 13 years of age, about 30 percent longer than average, and compared them with 186 Rottweiler bitches with an average life span of about 9 years of age.

"We found that how long females keep their ovaries determines in part how long they live," says lead investigator David J. Waters, D.V.M., Ph.D., DACVS, director of The Center for Exceptional Longevity Studies at the Gerald P. Murphy Cancer Foundation in West Lafayette, Ind. "Importantly, our study showed that bitches that kept their ovaries until they were at least 6 years of age were 4.6 times more likely to reach exceptional longevity than those with the shortest ovary exposure."

The researchers also studied 237 Rottweiler females that died before 13 years of age and found that removing the ovaries before 4 years of age reduced longevity by an aver-

age of 1.4 years and reduced threefold the likelihood of reaching exceptional longevity. The results suggest that ovaries may have a protective effect on the body and that removing the sexual glands puts bitches at higher risk for developing diseases.

"Our recent observation that dogs with intact ovaries live longer is counter to four decades of standard clinical practice, which advocated early elective ovary removal," Waters says. "We hope to identify exactly what the ovary-related processes are that influence aging and to learn the optimum length of time the ovaries should be retained to maximize health benefits. The ovary story is the first of many research results to follow in the field of aging and longevity that dog owners and their veterinarians will have to sift through."

Keeping dogs intact longer may contribute to reduced risk of certain cancers. For example, in Rottweilers, the prevalence of osteosarcoma and hemangiosarcoma is greatly reduced in intact dogs. Several studies have found that neutering or spaying at younger than 1 year of age increases the incidence of both cancers, Bailey says.

An aggressive bone cancer common in large dogs, osteosarcoma is among the most frequently occurring cancers and leading causes of death in Rottweilers. Likewise, hemangiosarcoma, a cancer that develops in the lining of blood vessels, is one of the three most common cancers in large dogs and is highly prevalent in Rottweilers.

"Rottweilers are prone to hemangiosarcoma and osteosarcoma based partly on their genetics," says Bailey. "In the overall dog population, these highly malignant tumors occur with a very low frequency of two dogs in 1,000. However, certain breeds, including Rottweilers, have a much higher incidence of these cancers."

More than a decade ago, researchers performed a study showing that spayed females had a five times greater risk of developing hemangiosarcoma than intact females and that neutered males had a 2.4 times greater risk than intact males. A study published in the July 1998 issue of *The Veterinary Journal* showed that neutered dogs have a 2.2 times greater risk of osteosarcoma than intact dogs.

Meanwhile, Waters and his research team at the Murphy Cancer Foundation and Purdue University reported similar findings in 2002. The investigators studied the medical histories of 683 Rottweilers and found that the risk for developing bone cancer was greatly influenced by the age when neuter or spay surgeries occurred. Male and female dogs that were neutered or spayed before 1 year of age had a two to three times higher risk of developing bone cancer than sexually intact dogs.

Spay & Neuter Surgery Alternatives

Sterilization alternatives to traditional spay and neuter surgeries include vasectomy for dogs and tubal ligation for bitches, in which the testes and ovaries are retained. Another alternative for bitches is a hysterectomy in which the uterus is removed but the rest of the female sexual organ stays intact.

Though canine birth control and hormone-replacement therapy is being studied, more information is needed. "Further research is needed to determine whether any form of birth control could effectively decrease the risk of unwanted pregnancies without increasing the risk of cancer," Bailey says. "Hormone-replacement therapy is controversial due to the risk of prostate disease in males and mammary tumors and uterine diseases, such as pyometra, in females."

Deojay, who lost Kaiser about 15 years ago, attributes the dog's CCL ruptures as the beginning of her quest to learn more about the causes and what could be done. "I have had no subsequent orthopedic problems with my dogs," she says. "I now wait until my Rottweilers are fully grown before considering spay or neuter surgeries. I even put this in my puppy contract."

The best advice, Bailey says, is to approach spaying and neutering of dogs on an individual basis. "Owners should consult their veterinarian about the most appropriate age to spay or neuter based on the unique physical condition of the dog. There is a clear need to expand our knowledge of the overall effects of reproductive hormones in both male and female dogs." ■

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