

ESP

Early Sterilization Program

By Dr. Dick Rosebrock

Early spaying and neutering, pre-puberal spaying and neutering, pediatric spaying and neutering are all talking about the same thing ... the neutering of our dogs and cats earlier than the commonly recommended and accepted ages. Veterinarians decided years ago that the time to spay a female dog or cat was after she had a litter. Motherhood appeared to mature the female. The male did not have babies so they were not figured into the formula and consequently ignored. Quite possibly a man thing. J Later we found that if the female dog was spayed **before** she had a litter, the incidence of mammary tumors was reduced to zero and the recommendation was modified to, "spay her just before her first heat". The client then asked, "When does she come into heat the first time?" And so, the time to spay her became, on the average, "about six months". Again male dogs did not have babies and many male owners anthropomorphised and were reluctant to have the males neutered. "Gee Doc, ain't you gonna let em have some fun?" This type of comment is still heard today. I usually ask if they have seen the dogs mating act. It is very uncomfortable and doesn't look to be much fun to me. Most male dogs were neutered to minimize or stop aggression; their part in the reproductive process was not viewed as a problem ... if the neighbor's bitch was in heat ... keep her locked up.

Well, times and attitudes changed. Unwanted puppies and kittens were inundating the planet and something had to be done. The hue and cry became, "spay and neuter" your dogs and cats. But S & N alone have not been able to quell the tide of pet overpopulation. The animal shelters are overcrowded ... animals were adopted and even though they were required to leave a neuter deposit ... fifty to sixty percent of these animals were not spayed or neutered and became contributors to the overpopulation problem.

Quietly over the past twenty-five to thirty years a few progressive animal shelters began various early sterilization programs with uniformly consistent success stories. If they are spayed or neutered **before** they leave the shelter ... they cannot become contributors. Puppies and kittens are being neutered as young as six to eight weeks. The development of new anesthetics and surgical procedures has made these procedures as safe or safer than the commonly accepted time of six months. The younger patients recover faster and have fewer surgical and post-surgical complications than their older counterparts. There is very little to no body fat to contend with, the incision is smaller, surgery time is reduced and recovery time is very short.

The research available on the physical, behavioral, short and long-term effects of prepubescent neutering in dogs and cats shows no adverse results. Based on this information, the American Humane Association supports this practice as a feasible solution to decreasing pet overpopulation and the tragedy of resulting deaths. Early sterilization practices are also endorsed by the American Veterinary Medical Association, the American Animal Hospital Association and the California Veterinary Medical Association.

On a personal note, I heartily endorse this program also. I have been actively participating in ESP since 1984 and have performed ESP on approximately 1000 animals. We have not noted any negative results, in fact, clients typically report these puppies and kittens are the "best we have ever had". We have not lost a single animal because of this procedure! Seven of sixteen Irish Wolfhound puppies from our last litter and two of nine from the litter prior to that were neutered prior to placement in their new homes at ten weeks of age. The first litter is now twenty-eight months, the last litter is now eighteen months old, and no negative results have been reported.

People worry that this early procedure might stunt growth. In fact, research shows that the dogs will actually get a little larger. The reason for this is that the long bones tend to grow for a slightly longer period. Since this extra growth is not caused by more rapid growth, but instead by prolonged growth, the implication is that this might be a good thing in our giant breed. It is known that when growth proceeds slowly over a longer period, the bone density (strength) increases.

Conscientious breeders have, for years, sold companion quality puppies without registration papers and/or with a non-breeding or spay/neuter contract to try and prevent undesirable reproduction. In fact, these methods were not always effective. Dogs, which shouldn't have been bred, still were. Pediatric spay/neuter is foolproof!

We offer this procedure at no extra charge to all our puppy purchasers who are not interested in showing their puppy. So far, in our last two litters, 100% of the buyers to whom we offered this procedure were thrilled to accept. It saved them money and the emotional trauma of having their pet undergo an elective procedure AFTER they had become attached to it. We strongly recommend that breeders consider this option and discuss it with your own

EARLY NEUTERING OF THE DOG AND CAT

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Early neutering of the dog and cat by Stubbs, Salmeri and Bloomberg. 1995. In: Bonagura (ed), Kirk's Current Veterinary Therapy, XII, WB Saunders & Co., Phila., pp.1037-1040.

Pet overpopulation continues to be a leading cause of death in dogs and cats in the United States, with millions of animals being euthanatized each year despite current population control programs. Surgical sterilization is the most common and reliable means of pet population control, leading most animal shelter/ control facilities to employ mandatory neuter policies. However, because surgery is usually delayed until dogs and cats are at least 6 months of age (Stone, Cantrell, and Sharp, 1993), many animals adopted from shelters remain sexually intact and are never neutered. Prepubertal gonadectomy or early age neutering (6 to 14 weeks) is being advocated by animal shelter and humane organizations as a means of enhancing the efficacy of sterilization programs. As the terminology suggests, surgical sterilization is performed prior to the onset of sexual maturity, and hence reproductive capability, which may occur as early as 6 months of age in dogs and 4 months of age in cats.

Although it is one of the oldest surgical procedures performed on domestic animals, few objective scientific data exist to suggest an optimal age for elective gonadectomy in the dog and cat (Salmeri, Olson, and Bloomberg, 1991). In the United States, dogs and cats are routinely neutered between 5 and 8 months of age. Most veterinarians are comfortable performing elective gonadectomy on animals of this age group because untoward effects are minimal. A more rational basis for this policy is lacking, however.

The safety of early neutering has been questioned by veterinarians because of their unfamiliarity with surgery and anesthesia on pediatric patients. Other concerns about prepubertal neutering of dogs and cats include stunted growth, obesity, perivulvar dermatitis, vaginitis, behavioral changes, urinary incontinence, increased morbidity/mortality during surgery and anesthesia, and impaired immunocompetence (Salmeri, Olson, and Bloomberg, 1991). In the cat, urethral obstruction (males) and defective formation of the preputial cavity (Herron, 1971) have been cited as potential problems. Mounting clinical and research data, however, would suggest that

most concerns regarding prepubertal gonadectomy are unfounded (Aronsohn and Faggella, 1993; Theran, 1993; Salmeri et al., 1991). In fact, several studies have found that early neutering affects skeletal and physical development, behavior, and urethral function in much the same manner as more traditionally timed gonadectomy.

CLINICAL AND RESEARCH DATA

The aforementioned concerns were addressed in two separate but parallel studies conducted at the University of Florida. The effects of prepubertal gonadectomy on skeletal growth, weight gain, food intake, body fat, secondary sex characteristics, urethral function, and behavioral development were investigated in both dogs (Salmeri et al., 1991) and cats. Both studies divided animals into three treatment groups: animals neutered at 7 weeks of age (I), 7 months of age (II), and those which remained sexually intact as a control population (III).

Gonadectomy (groups I and II) delayed closure of the distal radial growth plate in both dogs and cats as compared with sexually intact controls. This allowed for an extended period of growth and greater radial/ulnar length in all neutered male dogs and group I bitches. Although delayed physal closure was observed in neutered cats, there was no significant difference in mature radius/ulna length amongst the three treatment groups. Thus, rather than causing stunted growth, prepubertal gonadectomy may actually result in normal or greater stature. This delay in physal closure probably occurs because gonadal hormones facilitate physal cartilage maturation; in their absence the growth plate remains open for a longer period of time. Some investigators have suggested that this may increase the risk of physal fractures (Houlton and McGlennon, 1992).

In dogs, gonadectomy did not affect growth rate, food intake, weight gain, or back-fat depth (body fat). Body weight and body fat were similar among neutered (group I and II) cats; however, sexually intact cats weighed less and had less body fat than their neutered counterparts. Prepubertal gonadectomy had no adverse effect on urethral function in the dog or cat as deter-

mined by urethral pressure profilometry. Male cats of all three groups had similar urethras diameters.

The external genitalia of prepubertally neutered animals of both sexes and species remained infantile in appearance. Male cats neutered at 7 weeks of age had a virtual absence of penile spines, but the penis could be fully exteriorized, indicating separation of the balanopreputial fold. This is contrary to results describing persistent preputial adhesions in four of ten male cats neutered at 5 months of age (Herron, 1971). The penis, prepuce, and os penis of group I dogs were infantile, as were the vulvas of early neutered bitches and queens. No problems with vaginitis or perivulvar dermatitis were noted, however. Behavioral characteristics were similar amongst all groups with the exception of greater intraspecies aggression and fewer demonstrations of affection in sexually intact cats. Neutering did not result in lethargy or inactivity in either dogs or cats.

The safety of early neutering in a clinical setting has been well established (Aronsohn and Faggella, 1993; Theran, 1993). In the Massachusetts SPCA study (Theran, 1993), gonadectomies were performed on over 350 6- to 14-week-old dogs and cats without serious complications or mortality. The authors have had similar experience with a smaller group of research animals.

SURGICAL TECHNIQUES

Ovariohysterectomy

Methods for prepubertal ovariohysterectomy are similar to those routinely used in more mature animals and have been described in detail (Salmeri et al., **1991**; Aronsohn and Faggella, 1993; Theran. **1993**). Because of the small amount of abdominal fat present in young animals, visualization of the ovarian pedicle is excellent. This, coupled with the small vessel size, allows for precise hemostasis and shortens operative time. Fine (3-0 or 4-0) absorbable suture material such as chromic gut (chromic gut, Ethicon), polyglyconate (Maxon, Davis and Geck) or stainless steel hemostatic clips may be used for ligation of the ovarian pedicles and uterine body. The linea alba can be closed using either fine (3-0 or 4-0) absorbable or nonabsorbable suture material in an interrupted or continuous pattern. Closure of the subcutaneous layer is optional if skin sutures are to be used. The use of subcuticular sutures without skin sutures has been suggested (Aronsohn and Faggella, **1993**) to decrease the patient's interest in the incision.

Orchidectomy

In dogs and cats, the testicles are usually descended at birth and are easily palpable in the immature scrotum by 6 to 8 weeks of age. Orchidectomy in the kitten is similar to the procedure performed in adult cats. The spermatic cord may be ligated in a closed or open fashion with fine absorbable suture material, stainless steel hemostatic clips, or by tying the cord upon itself using a hemostat. The scrotal incisions are left to heal by second intention. A scrotal (rather than prescrotal) approach to the testicles is also used in 6- to 8-week old puppies. The procedure can be performed in an open or closed fashion, using absorbable suture material or hemostatic clips for ligatures. Fine subcuticular sutures can be used to close the scrotal incisions or they can be left to heal by second intention.

Pediatric Considerations

The potential for hypothermia and hypoglycemia, a relatively small blood volume, and delicate tissues are factors that must be considered when performing surgery on pediatric patients.

Hypothermia can be minimized by placing patients on recirculating warm water blankets during surgery and by administering warm balanced electrolyte solutions intravenously (ovariohysterectomy). The animal should also be kept from getting excessively wet during preparation of the surgical site. Neonates are also more susceptible to hypoglycemia than adults; therefore, food should be withheld no longer than 8 hr prior to surgery, with 3 to 4 hr being optimal in the youngest patients. If necessary, oral or intravenous 50% dextrose or oral corn syrup can be administered perioperatively and animals should be fed within a few hours of recovery. If not yet weaned, neonates should be returned to their dam and littermates as soon as they have recovered sufficiently from anesthesia. Handling of the animals should be minimized and they should be housed in a quiet environment preoperatively and postoperatively. Friable pediatric tissues necessitate gentle handling, with special attention given to careful hemostasis in light of the relatively small blood volume of these patients.

ANESTHETIC TECHNIQUES

Although concerns are often expressed regarding the risks and feasibility of pediatric anesthesia, it can be performed safely using a number of different techniques. Special considerations in the

pediatric patient include differences in drug uptake, distribution, and action as compared to adults as well as immature hepatorenal, respiratory, and cardiovascular system function (Grandy and Dunlop, 1991; Theran, 1993).

Neonates have a larger percentage of total body water, lower albumin concentration and body fat levels, and relatively high cardiac output to vessel-rich organs. All of these factors affect drug pharmacodynamics. A heightened sensitivity to protein-bound drugs may be seen and, in general, dosages of parenterally administered anesthetic agents should be reduced (Grandy and Dunlop, 1991). Pediatric patients have immature hepatic enzyme systems responsible for drug metabolism; therefore, anesthetics metabolized in this manner may have a longer duration of action. Glomerular filtration

and tubular function are also incompletely developed, delaying renal excretion of certain drugs.

The high rate of oxygen consumption in neonates necessitates a greater respiratory rate; therefore, anesthetic-induced respiratory depression and subsequent hypoventilation should be avoided by careful monitoring. Because of differences in respiratory dynamics, atelectasis is also of concern (Grandy and Dunlop, 1991). Cardiac output in young animals is mainly rate dependent and baroresponses are immature; therefore, bradycardia and hypotension should be avoided.

Various anesthetic combinations have been used successfully in pediatric patients. The preanesthetic administration of anticholinergics (atropine or glycopyrrolate) has been advocated by some authors to stabilize heart rate and thus cardiac output, and to decrease respiratory secretions (Grandy and Dunlop, 1991). We have not found this to be necessary however.

General anesthesia can be rapidly induced and maintained with isoflurane (AErrane, Anaquest) or halothane (Halocarbon Labs) administered by mask or tank infusion. Most young animals (6 to 14 weeks) will tolerate the required restraint with minimal excitement or struggling. A tight-fitting mask will serve well through out the short duration of an orchidectomy procedure. Endotracheal intubation should be performed in animals undergoing ovariohysterectomy. A 2.0- to 3.5-mm Cole or Magill endotracheal tube is recommended in kittens (Aronsohn and Faggella, 1993). Intubation should be gentle to avoid airway trauma and edema and the tube should be suctioned at 30-min intervals to prevent obstruction by respiratory secretions, a potential problem with tubes of such small diameter (Grandy

and Dunlop, 1991). It is also vitally important to select a tube of proper length to minimize dead space and

avoid endobronchial intubation. Isoflurane is probably the preferred inhalant agent in young animals due to its rapid induction and recovery characteristics (low solubility), decreased need for metabolism, and diminished cardiovascular depression as compared with halothane (Grandy and Dunlop, 1991). A nonrebreathing anesthetic circuit should be used for neonatal patients weighing less than 5 kg (Ayres T-piece, Bain circuit,

Norman elbow). Fresh gas flow rates of 200 ml/kg/min are recommended.

Several injectable anesthetics are suitable for premedication or anesthetic induction for longer procedures (ovariohysterectomy) or as sole agents for a shorter procedure (orchidectomy). In kittens, benzodiazepine/dissociative combinations such as tiletamine/ zolazepam (Telazol, AH

Robins) and midazolam (Versed, Hoffman-LaRoche)! ketamine (Ketaset, Fort Dodge Laboratories) are very safe and effective. Tiletamine/zolazepam at 11 mg/kg IM (2 to 4 mg/kg IV) has been recommended for orchidectomy in young kittens (Faggella and Aronsohn, 1993, Theran, 1993). If necessary, supplemental inhalational anesthetic can be provided by mask. This combination can also be used in puppies.

Midazolam (0.22 mg/kg IM)/ketamine (11 mg/kg IM) followed by intubation and administration of an

inhalant agent is recommended for feline ovariohysterectomy (Faggella and Aronsohn, 1993; Theran, 1993). The authors have successfully used an intravenous combination of 0.2 mg/kg diazepam (Valium, HoffmanLaRoche) and 5 to 7 mg/kg ketamine for anesthetic induction. Xylazine (Rompun, Miles) and phenothiazine tranquilizers (such as acepromazine) should be avoided in animals less than 3 months old because of their potential to cause bradycardia (decreased cardiac output) and hypotension, respectively. The use of barbiturates in animals less than 3 months of age is also discouraged.

Opioids provide analgesia and sedation as premedicants but should be administered with anticholinergics to prevent bradycardia. An advantage to their use is the potential for reversal with antagonists or agonist/antagonist agents.

Another option for intravenous anesthetic induction is propofol (Dipnvan, Stuart Pharmaceuticals). This drug produces a rapid, smooth induction and recovery. It is given at a dose of 4 to 6 mg/kg following premedications and 8 to 12 mg/kg as a sole agent. It has been used successfully for early neutering in pups (Theran, 1993).

Monitoring during anesthesia is similar to that performed in adults, with care being taken to prevent bradycardia, hypotension, and hypothermia. A Doppler ultrasound device (Ultrasonic Doppler Flow Detector Model 811-AL, Parks Medical Electronics) is useful to monitor blood pressure.

SUMMARY

Early neutering in dogs and cats is a safe and effective means of pet population control. The risks associated with surgery and anesthesia of pediatric patients are minimal, with the advantages being a shorter operative time, better visualization, rapid recovery, and decreased morbidity. The effects of prepubertal gonadectomy on skeletal, physical, and behavioral development are similar to those seen in animals that are neutered at a more traditional age.

Additional links below supplied by J.P. Yousha ([Chromadane](#))

Here are links to some articles about early spay/neuter. They are from the SPDR e-mail list (Seattle Purebred Dog Rescue):

<http://www.columbusdogconnection.com/PedSpayNeuter.htm>

Gives references to more articles and approving organizations, including the American Veterinary Medical Association.

<http://infoweb.magi.com/~cfhs/fact.htm>

<http://www.pacificpets.ca/spay&neuter.htm>

This one written by a veterinary reproductive specialist!

<http://arbl.cvmbs.colostate.edu/hbooks/pathphys/reprod/petpop/early.html>

From CSU.

<http://www.petloverspublications.com/oc/EarlySpayNeuter.htm>

<http://www.petorphans.com/earlyneut/earlyneut.html>

<http://www.warrickhumane.com/juvenile.html>

And here are some more articles and some fact sheets about early spay and neuter:

<http://infoweb.magi.com/~cfhs/fact.htm>

<http://www.rallyobedience.com/early.htm>

<http://www.cvm.uiuc.edu/ceps/ivb/spay-neu.htm>

Note here the AVMA comes out in support of *very* early "spay/neuter."

<http://www.petorphans.com/earlyneut/earlyneut.html>

<http://www.exoticbengals.com/spay.htm>

More also if you do a search on "Early Spay & Neuter," you'll find. It seems scientific studies are OVERWHELMINGLY positive with quite an impressive body of literature. Naturally it doesn't suit all animals in all places, but certainly food for thought & not to be dismissed lightly as a valid approach to both pet population control & pet H&W issues? Anyway, certainly "required reading" for the inquisitive DOL lot.

[HOME](#)