

Your Dog

The Newsletter for Caring Dog Owners



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Medicine

Dogs Adjust to Amputation

Owners have a tougher time, but the surgery is the gold standard for bone cancer treatment

BY FRAN PENNOCK SHAW

When given the startling news that their dog needs a limb amputated, usually because of severe injury or bone cancer, many owners have a harder time adjusting than their pets. But the truth is, dogs don't worry about their appearance and most have no problem getting around on three legs.

"They can run, play, swim, be with the family and do everything a four-legged dog can do, almost

as well," said John Berg, DVM, surgeon and chair of the Department of Clinical Sciences at Cummings School of Veterinary Medicine at Tufts University. "I've never had a dog unable to walk or get around after an amputation, when he was a good candidate for the surgery."

Nicole Ehrhart, VMD, associate professor of surgical oncology at Colorado State University's Animal

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Debunking the Myths About Amputation

John Berg, DVM, a surgical specialist at Cummings School, provided these answers to questions dog owners typically ask about amputation:

Q: Will my dog have phantom limb pain?

A: "No. I've never seen a dog I suspected had that problem."

Q: Will he be psychologically scared?

A: "No, absolutely not. I've never seen a dog become depressed or aggressive afterward."

Q: Should I treat my dog differently?

A: "Owners should try to treat their dogs the same way they always have. Don't coddle him or lay it on too thick — some dogs will think maybe something is wrong because the owner is lavishing all that attention."

For More Information:

- ◆ To learn more about pet prosthetics, visit www.mhmoandp.com/pet.htm or call (631) 473-8668.
- ◆ To read about Polar's saga, visit www.landofpuregold.com/polar.htm.
- ◆ To contact Veterinary Transplant Services, a veterinary tissue bank in Kent, Wash., call (800) 558-5223 or visit www.vtsonline.com. In certain circumstances, owners may donate their dog's bone and corneas after death.



Silver, a Husky shown here with his son, Kodi, underwent rehabilitation with acupuncture, water therapy and massage after complications from bone lengthening.

Cancer Center, devotes much of her time to saving dogs' limbs but agreed: "The gold standard for treating bone cancer is still amputation. We say dogs are born with three legs and a spare."

Bone cancer is common in dogs, and the most common form is osteosarcoma, a fast-growing cancer that quickly spreads throughout the body. It causes oppressive pain that medication often can't alleviate, which is a major rationale for amputation.

"We need to know what type of cancer it is, where it is precisely and how aggressive," said Dr. Ehrhart, a cancer specialist. "Standard treatment is to remove the tumor — 90 percent of the time we will amputate the limb."

**Amputation relieves
the pain without
necessarily
prolonging survival.**

Occasionally, dogs are poor candidates for amputation, however, such as those already missing a limb, very large or obese dogs especially if they have advanced hip dysplasia or arthritis, and dogs with spinal, orthopedic or neurological problems that make walking or balancing difficult. (See sidebar on page 16.)

Owners should recognize that an amputation can improve a dog's quality of life but won't extend it if the cancer already has spread. "Amputation relieves the pain symptoms without necessarily prolonging survival," Dr. Berg said. A dog with osteosarcoma who has a limb removed but no other treatment lives an average of five more months. "But those five months might be very important to an owner and the dog," he added.

An Artificial Leg Gave this Golden Retriever Mobility

When Pamela Patton decided her 2-year-old Golden Retriever needed his rear leg amputated because of an intractable infection, she began a search to have Polar fitted with an artificial leg afterward.

Polar had taught himself to walk despite being born with a disability Patton describes as similar to muscular dystrophy. He always had weak hind legs, weakened even more by 15 months of antibiotics, surgery and other treatments for osteomyelitis, an infectious, inflammatory bone disease.

His leg was amputated in December last year. Patton found a prosthesis designer who observed Polar's operation in consultation with orthopedic surgeon David Diefenderfer, VMD, at the University of Pennsylvania Veterinary Hospital.

"A normal dog would adjust, but Polar's remaining rear leg is almost backwards, and I never thought it would hold up a 55-pound dog," said Patton of Paradise, Pa. "Amputation was my only option, but he wasn't going to manage without a leg."

Marty Mandelbaum, president of M. H. Mandelbaum Orthotic & Prosthetic Services, Inc. in Port Jefferson, N.Y., spent several days before the surgery casting and fitting Polar, creating both a temporary and then a permanent prosthesis.

"You can't talk to a dog, so it's like working with very young children," he said. "You must monitor for



A prosthesis designer made a cast and fitted Polar with a temporary, then permanent prosthesis, shown in close-up at left.

blisters and irritation, and be careful the dog doesn't chew at it. It's a challenge."

Mandelbaum designs human prostheses but occasionally makes leg braces for dogs, and has now successfully custom-designed two dogs' prosthetic legs. He averages 10 requests monthly for information about pet prostheses but reminds those who contact him that "most dogs can get by well with three legs."

Dr. Diefenderfer also believes prostheses are rarely needed but added, "I think it's a consideration if there are problems elsewhere, and the owner has decided the patient just won't be able to get by on three legs, [and] if medically we can amputate, so enough leg can be left behind to accommodate a functioning prosthesis."

A prosthesis — which takes only

minutes to put on and take off — can work if a combination of factors is right, as in Polar's case, he said. "It's important that Marty was willing to take on the challenge and Pam's commitment to the dog was so great."

The dog's personality is also a factor, Mandelbaum said. Prostheses cost \$700 to \$3,000, with "every case and every prosthesis being totally different."

Polar's final prosthesis has a suction attachment and fits snugly against his joint without irritation. "He just leaves it alone," Patton said. "His whole life, that leg has been wrapped or bandaged or in a cart."

Today Polar walks well and has continuing aqua therapy and massage from a certified canine rehabilitator, she said. "I was able to take away a bad leg and give him a new one."

Grafts and a Novel Technique that Lengthens Bone Offer Alternatives

Some dogs may not be good candidates for surgical amputation. For dogs with special needs — such as those with muscular, skeletal or neurological problems — modern limb-sparing procedures can provide alternatives to amputation.

These limb-saving techniques, most often done at veterinary teaching hospitals, include:

- ◆ Bone transport, also called bone lengthening, which allows animals to very slowly grow new bone in a specific place.
- ◆ Allografts or the surgical insertion of synthetic plate and animal bone from a donor cadaver.
- ◆ Autografts, which are rare surgeries, involving bone grafts from elsewhere in the dog's own body.

Costs range from \$3,500 to \$5,000

for the procedures at Colorado State University. At Cummings Veterinary School, which performs amputations almost exclusively but on rare occasions performs limb-sparing techniques, costs vary from about \$2,000 for amputation to \$5,000 and more for alternative procedures.

"Traditional limb salvage is to use a larger piece of bone to reconstruct the limb or to use a metal spacer," said Nicole Ehrhart, VMD, a leading researcher in the field. She noted that owners can donate bones to a veterinary tissue bank after the death of their dogs. (See sidebar on resources.)

But in bone lengthening, a special frame — called the Ilizarov fixator — holds the remaining segment of bone after the surgeon has removed a tumor and/or portion of bone.

"Bone transport is a novel approach,



In bone lengthening, a special frame called a fixator holds the remaining segment of bone after the surgeon removes a tumor and/or a portion of bone. The body, believing it's trying to heal a fracture, grows new bone, and the veterinarian slowly adjusts the device.

where instead of reconstructing the defect, we actually grow new bone. You can trick the body into thinking it is trying to heal a fracture," Dr. Ehrhart said. The device is gradually adjusted "to very slowly move that piece of bone into the vacant space, so the parent bone fills in new bone material behind it."

Most veterinary surgeons will remove an entire foreleg, including the shoulder joint, regardless of where the tumor or injury is located because it looks better and eliminates the possibility of the dog chewing on a front stump. Some surgeons will leave a small stump on a hind leg, depending upon the location of the tumor or injury.

After an amputation, the dog is typically up and around in three days and doing all he normally would do in a week or so, Dr. Berg said. "I like to get dogs up and walking the day after surgery. Once they stand up — once they know they can do it —

they're very happy. They don't just lie around and mope."

Some activities are restricted for up to two weeks until sutures are removed. "After that, dogs can do whatever they want to do. After one or two weeks, most are feeling comfortable getting around on three legs," he said.

A dog may adapt faster to a hind leg amputation because a front leg carries more weight and is more involved in balance. Similarly, the younger and more trim the dog, the easier the adjustment. He will usually need pain medication at home for two to four days.

Physical therapy can help to strengthen the remaining legs.

"The surgery is major but not extraordinarily painful," Dr. Berg said. And because the dog often has been suffering from a bad limb, amputation itself provides pain relief. In fact, one of the major reasons amputations are recommended for dogs with bone tumors is that the pain of bone

About one millimeter, or .039 of an inch, of new bone grows per day in this procedure — more rapidly than the body normally develops bone tissue. This is a tedious, intense process for the dog and for the owner who must adjust and clean the device.

"The disadvantage is for a 13-centimeter [about a 5-inch] defect, it takes 130 days just to get the bone to grow and even more time for the bone to strengthen," Dr. Ehrhart said. "Work I'm doing in conjunction with the University of Florida is to try reducing the time involved."

The current length of time that the fixator frame must be worn can be a particular disadvantage for dogs with osteosarcoma, who usually have limited life spans because of the aggressiveness of this type of bone cancer.

Dr. Ehrhart began using bone

transport for cancer patients in 1996. In 2003, she operated on a 3-year-old Husky who is still alive and well.

"I felt Silver needed his leg," said Tom Christopher of suburban Chicago, but he also recognized that Silver needed immediate treatment for his painful osteosarcoma.

Initially, Silver's front leg had complications during bone lengthening, Christopher said. "My wife constantly had to clean the wound, clean the pins. I found a rehabilitation clinic with acupuncture, water therapy, a treadmill and massage because his leg atrophied."

However, the family was willing to do whatever was required for as long as it took, and today, Christopher said, "Silver is 100 percent on the treated leg."

Another use of the Ilizarov fixator is to straighten, reposition or lengthen bone in animals with deformities, such as shortened or

curved bones, those who suffer a severe fracture or young dogs who injure a growth plate — a pancake of specialized cartilage at each end of every bone, that the body uses to increase the length of the bone as a dog grows. Such corrective osteotomies aren't common, but they are more widely done at veterinary hospitals than the type of bone lengthening to avert amputation due to cancer, said John Berg, DVM, who specializes in surgery at Cummings School.

Major problems with all limb-sparing alternatives are that they pose a greater risk of infection, greater expense and greater chance for local regrowth of the tumor in cases of bone cancer, Dr. Berg said. However, bone transport procedures have a lower chance of infection and a better chance of healing than alternative allograft or autograft procedures.

cancer is very difficult to treat pharmacologically.

Physical therapy can help dogs with amputations if they need to strengthen the remaining legs or soothe stiffness and soreness, said Christine Rico, a certified canine rehabilitation practitioner in Catonsville, Md. An underwater treadmill is especially useful if the dog is reluctant to walk naturally. Swimming, massage and home exercises also help.

Rico herself adopted an abused German Shepherd puppy whose hind leg needed amputation because of severe injuries. "Tootsie used to walk like she was drunk, and we did

aquatics therapy to help her gait and give her confidence." Now 2 years old and despite her hip dysplasia, Tootsie is doing well.

Barbara Gerber of Conestoga, Pa., agreed to a leg amputation for her Golden Retriever, 9-year-old Ginger, to keep bone cancer from spreading. "We thought she'd take longer to recover, but she was up and bouncing around right away. She's really remarkable about all this," said Gerber. "She still runs after her tennis balls. She plays in her swimming pool. She doesn't act like she realizes she's missing a leg. I help her going up steps because I'm

scared — not her. Really, when they said the best thing to do was amputate, we knew with her personality, she'd adapt."

Ginger's new nickname: Tripod.

Mickey Morgan, DVM, a veterinarian in Lititz, Pa., adopted Ruby after the Pomeranian was attacked by a German Shepherd and her front leg was nearly ripped off. After amputation, when Ruby initially tried to walk, she'd trip, Dr. Morgan said. "But now, when she wants, she can run like the wind." ♦

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