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Tiny Patients: “Nala” and “Quasimoto” -- Surgery for Persistent Right Aortic Arch in Cat/ Enucleation

Surgery and anesthesia on very small animals presents a multitude of problems for the veterinarian. These animals are difficult to keep warm during surgery because they lose heat so rapidly. They have little to no body fat to maintain an adequate body temperature during long anesthesia. We use a special hot water “blanket” to help keep our surgical patients warm (Figure 1). Hot water is pumped through the blanket continuously during the surgery. We also take great care to minimize any contact of skin with the cold stainless steel surgical table, because the table extracts heat from the patients very quickly. The amount of anesthesia has to be closely regulated so an overdose is not delivered. Instrumentation needs to be very small, in many cases microsurgical. We may even use magnifying loupe surgical glasses to help with visualization of the patients’ tiny parts (Figure 2). Occasionally, even an operating microscope may be necessary (often used in fine eye surgeries). The endotracheal tube, which delivers gas anesthesia, can often be no more than 2-3 mm in diameter. Here we present two cases where many of the above problems had to be overcome. These two animals were the smallest to undergo major surgeries at our hospital.



Figure 1.
Hot water “Blanket”

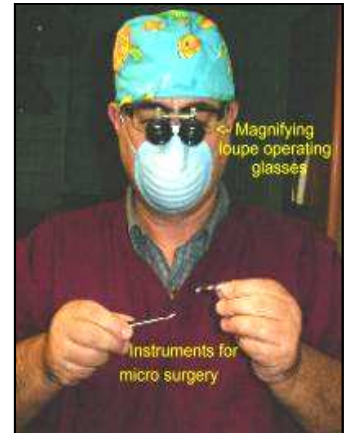


Figure 2.
Dr. Persky with Loupe Glasses for Microsurgery

“Nala” was presented to our hospital as a five week old kitten that was vomiting immediately after a meal of solid food. She was also half the size of her litter mates. Nala weighed exactly 1.2 pounds. On complete physical exam the cat was normal except for its size. A barium plus food swallow revealed a dilated esophagus anterior to the heart shadow on x-ray (Figure 3). A preliminary diagnosis of persistent right aortic arch was made. This is a congenital anomaly in which the aorta exits from the heart on the wrong side thus dragging a closed fetal vessel (ligamentum arteriosum) across the esophagus thus constricting it.

Figure 3. Esophagram of Nala, showing dilated esophagus.





“Nala” and “Quasimoto” cont.



A surgical exploratory of the chest was done the next day. A left lateral approach to the chest was used at about the 4th intercostal space. The anesthesiologist had to breathe for the little cat while the chest was open. The esophagus and the aorta were both smaller than a straw. Microsurgical instruments and microscopic magnification were essential. Unfortunately, the entire esophagus was dilated, thus changing the diagnosis to an esophageal motility disorder, which can not be surgically corrected. The cat’s temperature was maintained during surgery with a warm intravenous solution of lactated ringers and a circulating hot water blanket. Nala recovered from surgery (Figure 4) and, two months later, has doubled her weight. We have to blend her food and she eats from an elevated plate so the food drops into the stomach by gravity.

— “Quasimoto” —

“Quasimoto” was a three to four month old kitten presented because of a severely injured eye. This little male kitty was in perfect physical condition except for the eye. The eye was beyond repair and had to be removed. Quasimoto only weighed 0.8 pounds. In order to deliver gas anesthesia to this little cat, we had to use the very smallest endotracheal tube made (Figure 5). The enucleation (eye removal) was the easiest part of the entire procedure (Figure 6). Maintaining this little animal’s body temperature during and after anesthesia was very difficult. A warm water bottle placed beside the kitten was used in addition to the heating mechanisms described above. We are very happy to report that Quasimoto made an uneventful recovery.



Figure 4.
Nala immediately after surgery, with a ball-point pen for scale.

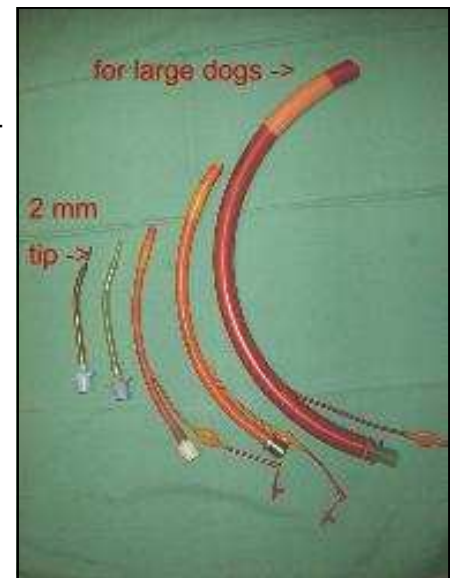


Figure 5.
Endotracheal tubes, showing the smallest size used on Quasimoto.

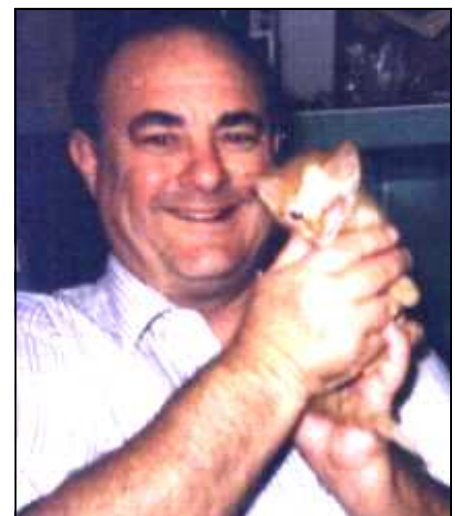


Figure 6.
Dr. Persky with Quasimoto, immediately after surgery.