# SEX DETERMINATION IN BIRDS OF PREY BY LAPAROTOMY

by
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Many problems are encountered in breeding projects involving birds of prey, not least is knowing that one does have a male and female. Most of the successful breeding experiments have been done with American Kestrels. Since these birds are sexually dimorphic, pairing them has been relatively simple. The larger hawks and falcons, however, are sometimes very difficult to sex by external characteristics. The main criterion that most people go by is size difference, the female usually outweighing the male considerably. Notwithstanding, even the most experienced ornithologists and falconers must admit that there are weight overlaps in both sexes.

Admittedly, if one has observed his bird in nesting activity he can be sure of sex by behavioral characteristics. On the other hand, if wild trapped birds are being used for breeding, sexing is almost impossible. We were faced with this problem in our current breeding project with Red-tails. Two adult Red-tails were trapped at random and according to body weight and foot size both were males. The birds weighed 37 and 38 ounces and there was no difference in foot size.

We decided to perform an exploratory laparotomy and examine the gonads macroscopically to determine sex. We found the 37 ounce bird to be a male and the other a female.

The surgical technique is relatively easy. The same approach is used as in caponizing roosters. The poultry people use no anesthesia and do not suture the abdomen. The estimated mortality rate in their procedure is about 1%. We do

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not boast that there is no risk in this procedure with birds of prey, but if done properly the mortality rate should be close to zero. We have performed laparotomies on about 30 birds of various species and have lost none.

Anesthesia can be accomplished by using gaseous or parenteral anesthetics. Our anesthetic of choice is halothane, which is a volatile anesthetic and requires a gas anesthetic machine. The only parenteral anesthetic we recommend is Equi-Thesin which is usually injected intramuscularly. The dosage is 0.20-0.25 ml. per 100 grams of body weight (Gaudal, 1969). The weight-dosage relationship is very critical when using any parenteral anesthetic since a slight overdose may kill the bird. In view of this danger, it is very important that the bird be weighed accurately and the dosage calculated accordingly.

In our procedure we induce anesthesia by placing a cone connected to the gas machine over the nares and mouth of the bird. The halothane vaporizer is turned to 5%. In using a cone for induction, halothane vapor may get into the eyes causing a keratoconjunctivitis. We recommend that 2-4 drops of a suitable wetting agent be placed in the eyes before coning which should prevent damage to the cornea. Ideally, a cone should be fashioned that prevents exposure of the cornea.

When the bird's eye lids close and the mouth can be opened with relative ease, one should be able to pass an endotracheal tube into the larynx. For a bird the size of a Red-tail we use an appropriate sized cat endotracheal tube that is commonly used in veterinary surgery. After the bird is intubated the anesthetic vaporizor is turned down to about 1.5%. This is a relative percentage and will vary with different machines and even individual birds.

Anesthesia is monitored by respiration rate, color of mucous membranes, and heart rate. These parameters, of course, vary with different species of birds which the anesthetist must determine at the time of surgery.

Once surgical anesthesia is reached, the bird is placed on its right side. In most birds of prey, except accipiters, only the left ovary develops. After the bird is secured to the operating table, the down feathers are plucked from an area in front of the thigh about the full length of the thigh and half as long.

A skin incision is made over the sartorius muscle. The skin is incised starting ventral to the ilium distally to about mid-

way down the thigh. Hemostasis is usually no problem and is controlled easily by digital pressure with a 4x4 gauze sponge. The subcutaneous tissue is bluntly dissected until a blunt type retractor can be placed under the sartorius muscle. The entire thigh is retracted posteriorly exposing the 7th and 8th intercostal space.

An incision is then made in the intercostal muscles large enough to insert an otoscope speculum which is used to examine the gonad. The otoscope handle is placed on the speculum permitting one to view the abdominal organs.

The abdominal air sac is the first structure seen once in the abdomen. Occasionally the air sac is cut when the intercostal muscles are incised. This is really no problem since the air sac can be sutured with 4-0 chromic gut at the end of the procedure. The posterior border of the lung is then located by directing the speculum slightly anterio-dorsally over the air sac. Lying just caudal to the lung is the anterior lobe of the kidney. The adrenal gland, a bright yellow structure, can be seen at the anterior medial border of the kidney. The gonad is located just ventral to the anterior lobe of the kidney. The ovary appears as a cluster of grapes, the grapes of course representing follicles. The color of the ovary is light yellow to white.

The testicle is elongated in shape and is quite pendulous and large when the bird is in season, but will be very small and more closely adhered to the kidney and adrenal gland if the bird is in refraction. The color of the testicles in the birds of prey we have examined was light yellow.

Once identification of the gonad has been made, one proceeds with closure. As mentioned earlier the air sac if incised can be closed with 4-0 chromic gut. The intercostal space can be closed with 1-0 gut, usually one or two interrupted sutures placed around the anterior border of the 7th rib and posterior border of the 8th is sufficient. The skin incision is closed with 3-0 chromic gut using a simple continuous suture pattern.

Since avian body temperature is relatively high, gross bacterial contamination of the wound is unlikely. No postoperative complications following this procedure should be expected as long as the bird is well cared for.

The down feathers that were plucked from the surgical site will grow back within 6-8 weeks. It is also cosmetically

acceptable, since the longer breast feathers and wing will cover the incision.

## Literature Cited

Gaudal, C.P. (1969). Surgical Techniques and Anesthesia. In *Diseases of Cage and Aviary Birds.* Philadelphia, Lea and Febiger, p. 219.