Cesarean Section in a Cyclura

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Cyclura nubila, Cuban rock iguana, is a large endangered rock iguana native only to Cuba and its satelite islands. I personally find them to be one of the most beautiful of the large iguanas.

Captive raised females usually successfully lay their first clutch of 3-7 eggs when they are between 29 months and 60 months of age. Private breeders report that these iguanas will breed at age three years when fed a mixture of vegetables, such as; kale, romaine, squash, broccoli, sweet potato and carrots, fruits, including papaya, mango, cantaloupe, apple, and grapes, and a protein source such as dog food or chicken, alternating, offered one to two times a month (A successful private breeder of *Cyclura* also feeds spinach, and while that is subject to varying opinions, the excellent results of his breeding program are difficult to fault). A good quality vitamin supplement and calcium supplement should also be added twice weekly to the diet.

In Florida, *Cyclura* breeding season usually begins in May which coincides with the natural breeding season on the Islands. In captivity, adults are housed in outdoor pens, allowing them natural sunlight, in pairs, as mature adults are very territorial. Males may fight viciously with each other during breeding season and if housed in groups, even juveniles will display head bobbing and signs of aggression between themselves. Territoriality is displayed by both males and females. On the Islands, iguanas are usually sighted singly and do not remain in pairs during most of the year.

Eggs are laid approximately 6 weeks after copulation. Gravid captive females will usually lay between 6 and 20 eggs under a plywood board, beneath which a tunnel has been dug in the sandy soil, by the female. The outdoor pens have wire buried one meter deep to prevent the iguanas from escaping.

On Cuba, copulation and nesting behaviors have not been observed. The terrain where they breed on the Island is limestone rock and sand, with dense vegetation, making sightings very difficult. Females dig a tunnel in the sand about 30-50 cm deep to deposit and cover the eggs.

The female will actively guard her nest and it may require two people to remove the eggs for artificial incubation. Eggs are incubated at 28-30°C and fertility can be ascertained within two or three weeks, depending on the incubating temperature. (The breeders in this case do not monitor humidity, they use damp vermiculite, adding H_20 when necessary and place the eggs in plastic containers with holes cut in the lids; it seems to work). The eggs may be candled with a strong light without handling. Signs of fertility begin with a dark disk in the dorsal 1/4 of the egg and sometimes evidence of a vein forming. Hatchlings emerge at about day 98. As with other herp eggs, eggs should be marked, moved gently, and re-placed in the vermiculite in the same position as they were oriented in the nest.

History and Physical Findings

In July, 1990 a gravid, second generation captive-bred *Cyclura nubila,* age 18 months, was presented for probable dystocia. She was housed in an outdoor pen with 11 other juvenile *Cyclura nubila,* all hatched during the fall of 1988. No copulation had been observed among the young in this pen. She had an obviously distended abdomen. Since females usually lay eggs in May or June, if she was in fact, gravid, then she was one to two months overdue to oviposit, but had evidenced no nesting behavior. For three days prior to presentation, she had been anorectic. She was not clinically dehydrated. She was depressed. Her weight was 426 grams. (There are no published normal weights for *Cyclura nubila* at this time, but based on tail girth, she did not appear to be underweight).

Diagnosis and Treatment

Lateral and ventral-dorsal radiographs were taken, confirming bilateral soft tissue densities, averaging 2.5 cm by 4 cm ovoid. Based on physical exam, history, and the tissue densities on the right and left sides, retained eggs were strongly suspected. She was placed in a thermal-bath incubator set at 33°C and given an injection of Calphosan, 3 cc Sub-Q (Ben Venue Labs, Tenafly, NJ) then five units of oxytocin, Sub-Q as well. Her condition did not change over the next 12 hours, so it was decided to perform surgery.

Surgery

She was anesthetized in a small plexiglass chamber with 4% isolfurane and maintained between 1-1.5% via small face mask. She was placed on a water circulating heating pad and prepared for surgery with a providine scrub (three times). A left-sided longitudinal paramedian incision was made through the skin and abdominal musculature. The eggs were clearly visible through the stretched thin oviductal wall, which was incised in an avascular area. There was very little bleeding. The egg in the left oviduct was extruded by gentle manipulation, then the two eggs in the right side were gently removed through the same incision being careful not to tear the delicate tissue. The oviduct incision was closed with 5.0 Prolene (Ethicon) in a simple-interrupted pattern then with a Conell continuous oversew of 5.0 Prolene (Ethicon). The coetomic membrane and muscle wall was closed with 3.0 chronic catgut in a simple interrupted pattern. The skin was closed with 3.0 Dermalan (Ethicon) in an interrupted horizontal mattress pattern slightly everting the wound edges. The wound was sealed with Vetbond (3M Animal Care Products, St. Paul, MN). The lizard was placed back in the incubator and recovery was uneventful. The eggs were soft, grayish-yellow, gelatinous, and uniform in consistency. Because of her young age, and the abnormal appearance of the eggs, the eggs were considered infertile. Incubation was not attempted by the breeder. Post operatively, the iguana was given 30 ml of lactated Ringers sub-Q and injectable amikacin, at 2.5 mg/kg every 48 hours. Her weight improved immediately after surgery and was 286 grams.

The lizard was sent home the following day on injectable Amikacin every 48 hours for seven doses, along with 10-15 cc's of Lactated Ringers to be administered Sub-Q, daily, and was maintained at 27°C in a temperature controlled room in a wood and glass enclosure. Her appetite returned on the third day post-operatively. Sutures were removed in four weeks.

Discussion

Based on her size and the group of *Cyclura nubila* with which she was housed, there is little question that she was less than two years old, and definitely considered a sub-adult by breeders familiar with *Cyclura nubila*. The breeders had hatched her at their facility, and their records put her into the 1988 fall hatch.

I do not believe that this procedure had ever been successfully performed on such a young *Cyclura*. Since no physical abnormalities were discovered at surgery, I can only surmise that she was not mature enough to physically go through the motions of egg-laying.

She did not produce eggs during the 1991 breeding season as she was housed with juveniles (also hatched in the fall of 1988), to discourage reproductive behavior. There is a chance of post-surgical stricture due to the surgery, but our hope is that when she is larger and more capable of successful reproduction, that she will be able to perform normally. My feeling is that her small size and immaturity led to the egg retention, but only time will tell.

References

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Margaret Wissman graduated *summa cum laude* from Bethany College, 1977 and received her DVM at the University of Illinois in 1981. She sees strictly birds and exotics, including primates, and owns the Icarus Mobile Veterinary Service in Wesley Chapel, P.O. Box 7322, Florida 33543. She is active in the Association of Avian Veterinarians, and is presently on the PR committee.

From the Journal of Small Exotic Animal Medicine.