

GUIDELINES FOR EUTHANASIA DECISIONS OF FIBROPAPILLOMA GREEN TURTLES IN THE HAWAIIAN ISLANDS

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BACKGROUND

Fibropapillomatosis (FP) is a disease found in sea turtles. It is manifested by wart like growths on the epidermis, on and around the eyes, the jaw, in the mouth and on the glottis. Internal tumors may also be present in various organs. It is thought to be aggravated by a complex mixture of factors but a herpes virus is consistently associated with the disease. Severely affected turtles are immunosuppressed and bacteremic and because of a poor prognosis are candidates for euthanasia. Less severely affected turtles are salvageable through judicious clinical intervention such as surgery.

In Hawaii, the turtles that strand with FP are collected by an island wide stranding network of dedicated people working through NOAA's Pacific Islands Fisheries Science Center (PIFSC) who are on call seven days a week.

BEACH OR LAND STRANDINGS

This is the most common source of live tumored turtles year round. Stranded turtles are usually seen on the beach for extended periods of time (days) and must be distinguished from "basking" turtles. The beach basking behavior is unique to Hawaii and several other locations in the world. Basking turtles are usually normal healthy turtles that haul out on the beach for variable lengths of time, but some may have tumors.

OFFSHORE RECOVERIES

These turtles may be found entangled in fishing gear (nets, lines and floats) while others have buoyancy problems. They are recovered by swimmers, snorkelers, fishermen and dive groups.

When a turtle with FP is recovered from the beach or offshore, it is evaluated for tumor severity and a decision is made to treat, release or euthanize. One important factor to consider is that tumor regression has been documented. Rational guidelines for treatment and/or euthanasia have been established over the years based on the experience of veterinarians and the team leader of the PIFSC Marine Turtle Research Program.

THE TURTLES CAN BE CLASSIFIED IN 3 WAYS

1. No tumors visible. The tumors may be internal or be oral.
2. Tumors visible. May be lightly tumored or heavily tumored.
3. Tumors plus other injuries visible. This could include fishing line or net entanglement, shark injuries, boat strike or other causes of trauma. It must be determined whether the tumors or the injuries are the primary problem.

CLINICAL EVALUATION

1. Conduct a thorough physical examination including a complete external, oral and ocular exam and evaluation of body condition.
2. Blood evaluation. A packed cell volume (PCV) and total protein (TP) can be very informative and inexpensive. Additional tests such as a complete blood count (CBC) and chemistries might be useful.
3. Radiographs. Very useful to detect pneumonia, internal tumors, and gastrointestinal problems.
4. Endoscopy. Another tool for detection of internal tumors.

TURTLES WITH A GOOD PROGNOSIS

1. Lightly tumored turtles with other problems. This would include fishing line, net entanglements, fish hooks, shark injuries and other forms of trauma. The tumors are not a factor in the stranding. The turtles are treated, rehabilitated and released.
2. Turtles with few numbers of tumors that are treatable and in doing so will enhance their survival. Examples would be those not obstructing vision, the ability to forage or impede swimming. Removal may be by surgery or cryosurgery. Some success has been obtained by injection of NeoplaseneX (Buck Mountain Botanicals), an extract of the Bloodroot plant.
3. Lightly tumored turtles that have been picked up on the beach and are determined to be "baskers". These are found to be in good condition and may be released without treatment.

TURTLES WITH A POOR PROGNOSIS THAT MAY BE CANDIDATES FOR EUTHANASIA

1. Glottis tumors. These can be very obstructive, can impede respirations and eating, and are often difficult to remove. Pneumonia is often a secondary complication.
2. Jaw tumors, jaw hinge tumors and tumors of the mouth. These tumors often tend to invade and lyse bone, the retroorbital salt gland, or the lateral canthus or obstruct the choanae.
3. Facial tumors. Some of these can be large (3+ cm) and very bone invasive.
4. Ocular tumors. These frequently originate from the secondary lid or the lateral canthus and can obstruct vision. Others are attached to the sclera and invade the globe. The degree of vision is evaluated, and a 75% loss of total vision and total blindness usually warrants euthanasia.
5. Internal tumors. These are more difficult to diagnose and are usually detected on radiographs or endoscopy. Most are fibromas, myxofibromas, or fibrosarcomas. They always indicate a poor prognosis. In Hawaii, they are most often in the lungs.
6. Moderate to severe emaciated turtles. The degree of emaciation is determined on the appearance of the plastron and is scored a 1, 2, or 3 with 3 being the most severe (Work and Balazs, 1999 J. Wildlife Diseases). The plastron and inframarginals can be sunken and soft in the most severe cases. Slight undulations in plastron scutes also indicate a poor prognosis.
7. Large number of tumors. A tumor score of 2 (moderate) or 3 (severe) based on criteria by Work and Balazs can indicate a poor prognosis (1999 J. Wildlife Diseases).
8. Buoyant turtles. Some of these have internal tumors as well as complications from other tumors (mouth, glottis).
9. Lethargic turtles. Evaluation of the degree of vigor or strength can be of value in determining the outcome of the case. A weak turtle with little movement suggests a poor prognosis.
10. Anemia and hypoproteinaemia. Packed cell values below 18.0% suggests severe anemia. Low total protein values (2.8 g/dl or lower) can indicate a guarded prognosis.
11. Heavy incrustations of barnacles, mollusks, leeches, or algae. This condition strongly suggests prolonged inanition and usually merits a poor prognosis.

The decision to euthanize a patient is made with great care. The turtle is first assessed by a veterinarian with extensive experience in clinical management of sea turtles. Most of the turtles have a combination of the 11 conditions listed above and a decision is usually straightforward. If there is

doubt or a clear cut prognosis cannot be assigned by the attending clinician, the turtle is further evaluated by a sea turtle biologist with extensive turtle experience (the team leader of the Marine Turtle Research Program), and by a veterinary pathologist. Failure to come to a consensus on euthanasia either results in release of the turtle or additional observation and/or clinical tests and treatment. The protocol for humane euthanasia is the injection of a commercial solution of pentobarbital (390 mg/ml) at a dosage of 2 cc per 10 pounds directly into the heart or dorsal cervical sinus (external jugular). Death usually occurs in 20 minutes but can take longer (>1 hour). Lack of corneal reflex, jaw and tail reflex are used as indicators of death. If the necropsy is to be done directly after euthanasia, the pathologist injects 1 cc of the euthanasia solution into the foramen magnum and then severs the cervical spinal cord. Every euthanized turtle undergoes a complete necropsy. Tissues and body parts are utilized for tumor research and biological studies to increase our understanding of the causes and pathogenesis of FP.

EXAMPLES OF FIBROPAPILLOMA EUTHANASIA CASES



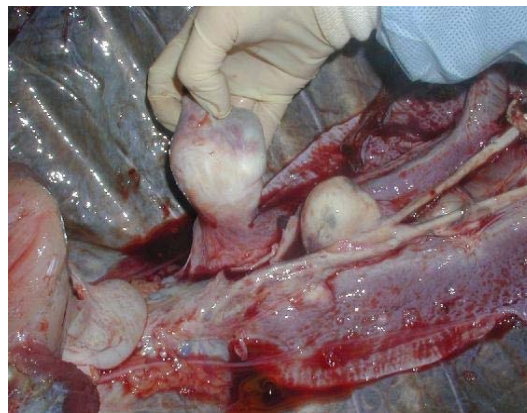
Severe glottis and mouth tumors



Jaw tumor with bone lysis



Heavy algae growth



Lung tumors



Necrotic eye tumor



Large number of tumors