Thyroid Adenoma and Ovarian Luteinization in an Aged Fisher (Martes pennanti)

Authors: Carlson, Brent L., and Nielsen, Svend W.

Source: Journal of Wildlife Diseases, 21(3) : 320-324

Published By: Wildlife Disease Association

URL: https://doi.org/10.7589/0090-3558-21.3.320

a potential mortality factor for the bald eagle and other raptors.

We thank J. Moore for conducting lead analyses, E. Hill for cholinesterase determination, R. Laybourne for identifying bird remains, and V. Ricker for bringing this case to our attention.

Journal of Wildlife Diseases, 21(3), 1985, pp. 320–324

Thyroid Adenoma and Ovarian Luteinization in an Aged Fisher (*Martes pennanti*)

Brent L. Carlson and Svend W. Nielsen, Northeastern Research Center for Wildlife Diseases, University of Connecticut, Storrs, Connecticut 06268, USA

Fishers are mustelid fur bearers of economic importance found only in North America (Powell, 1981, Mamm. Species 256: 1–6). Most current literature on fishers deals with biology, ecology, and management (Hamilton and Cook, 1955, N.Y. Fish Game J. 2: 13–35; Kelley, 1978, Fisher (*Martes pennanti*) biology in the White Mountain National Forest and adjacent areas, Ph.D. Thesis, University of Massachusetts, Amherst, 178 pp.; Powell, 1981, op. cit.; Strickland et al., 1982, *In* Wild Mammals of North America, Chapman and Feldhamer (eds.), University Press, Baltimore, pp. 586–598) or on parasites in specific geographic locations (Meyer and Chitwood, 1951, J. Parasitol. 37: 320–321; Hamilton and Cook, 1955, op. cit.; Dick and Leonard, 1979, J. Wildl. Dis. 15: 409–412). Strickland et al. (1982, op. cit.) stated that parasitism in fishers is frequent but does not appear to be a serious mortality factor. Very little information is available on naturally occurring diseases of fishers. In this report we describe the pathologic findings in a 11-yr-old female fisher that had been raised in captivity since shortly after birth.

Two female fisher kits were found in the spring of 1973 during a logging operation in the White Mountains of New Hampshire. Both were donated to the Science Center of New Hampshire on Squam Lake in 1974 as part of an education ex-

FIGURE 1. Large cyst (arrow) in caudal part of left thyroid of an 11-yr-old fisher.

Received for publication 9 July 1984.

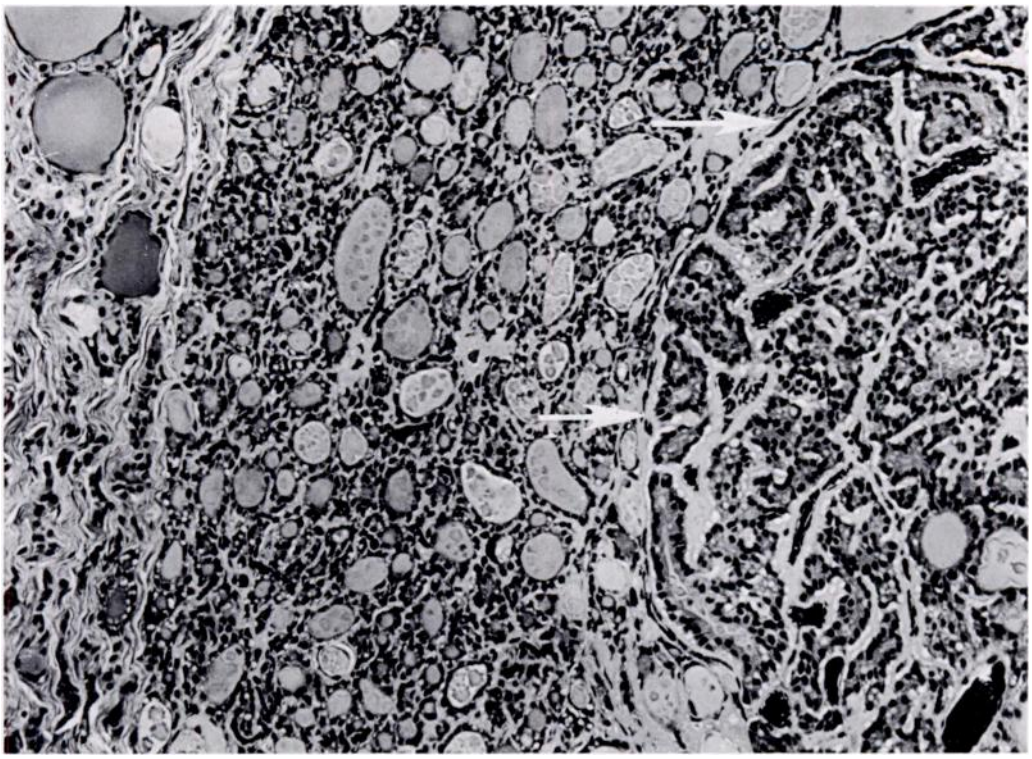

FIGURE 2. Focal adenomatous nodules (arrows) in an area of hyperplasia in left thyroid of an 11-yr-old fisher. H&E, ×100.

hibit. One fisher died in December of 1981 from unknown causes.

The diet consisted of a base ration of cat food and mink chow supplemented with vitamins and raw pork and beef kidneys or road kills. Since November 1983 when the fisher was given to the Northeastern Research Center for Wildlife Diseases, the diet had consisted of commercial dry cat food and ground beef.

Two weeks before her death, the fisher became progressively anorectic, and 2 days before she died she was listless, weak, had head tremors, an unsteady gait, and swayed from side to side when walking. She was uninterested in food and remained curled up most of the time.

At necropsy the animal weighed 1.8 kg, was extremely thin, and had a thin fur coat. The caudal portion of the left thyroid had a large, thin-walled, fluid-filled cyst measuring 2.5 × 2.5 × 4.0 cm (Fig. 1). The ovaries appeared grossly normal. The liver was yellow and the stomach and large intestines were empty except for a dark viscous mucus. No other gross lesions were observed. The cause of death could not be determined.

Histologic examination of both thyroids revealed nodules of varying size separated by a dense connective tissue stroma containing a few follicles lined by flattened follicular cells and small clusters of follicular and parafollicular cells. The nodules were characterized by areas of hyperplasia with follicles of different sizes containing pink, vacuolated colloid and lined by flat or cuboidal epithelium. Many of the follicular cells had vacuolated cytoplasm and eccentrically located nuclei. There were several focal, well-demarcated adenomatous nodules within the areas of nod-

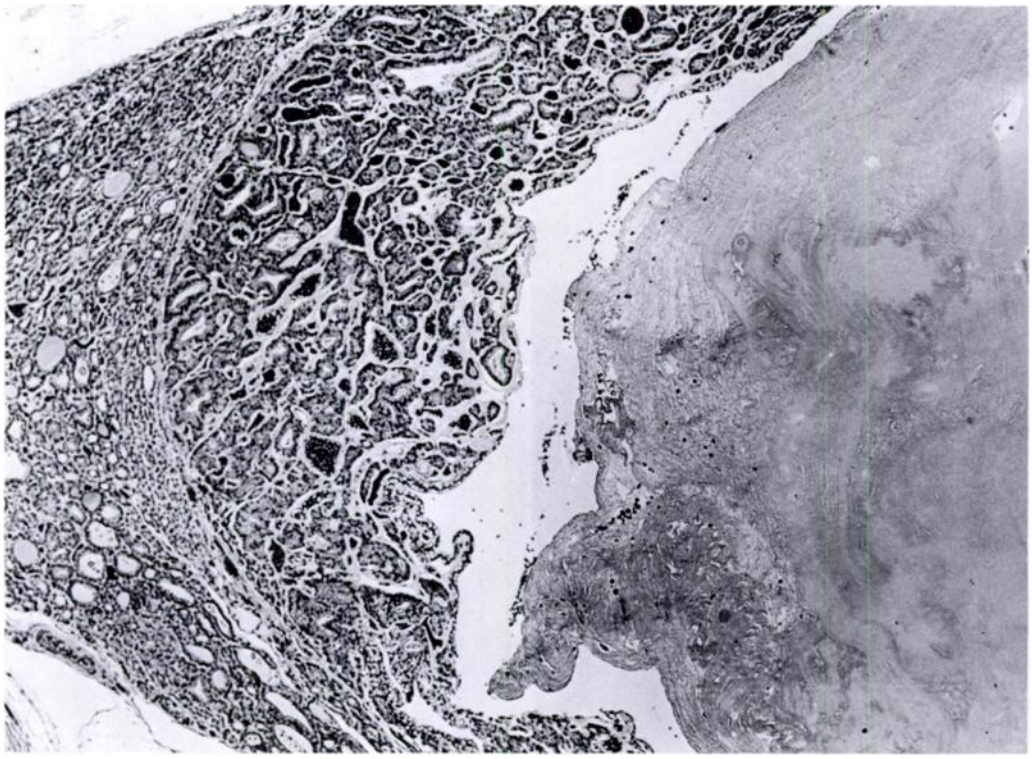

FIGURE 3. Large colloid cyst within an adenomatous nodule of the left thyroid of an 11-yr-old fisher. H&E, ×40.

ular hyperplasia or isolated in the thyroid parenchyma (Fig. 2). They consisted of either colloid-containing follicles lined by a flat epithelium or other follicles with columnar epithelium. Several large colloid cysts, the largest of which was present in the left thyroid, were observed within adenomatous nodules in both thyroids (Fig. 3).

Both ovaries contained a large amount of luteinized interstitial tissue in the medulla resulting in a thinning of the cortex, which contained a few resting oocytes (Fig. 4). The luteinized cells were small and contained very little lipid (Fig. 5). The endometrium appeared thickened, the epithelial lining was folded, and the glands branched and convoluted, containing a pink proteinaceous material.

In the liver there was a diffuse, moderate fatty change and a more severe focal area in which the cytoplasm of the hepatocytes was either finely vacuolated or contained a large clear vacuole that had compressed the nucleus to the margin of the cell. Hemosiderin was deposited throughout the liver.

Microscopic examination of the skeletal muscle revealed numerous encapsulated larval nematode sections identified as *Trichinella spiralis* (Chitwood and Lichtenfels, 1972, Exp. Parasitol. 32: 407–519) occurring singly or in groups of three or four. There also was focal muscle fiber atrophy associated with an apparent hypercellularity and focal areas of muscle fiber degeneration and Zenker's necrosis. Encysted larvae were also present in the skeletal muscle of the esophagus.

Other incidental findings included a mild diffuse vacuolization of the neuropile and cytoplasm of a number of neu-

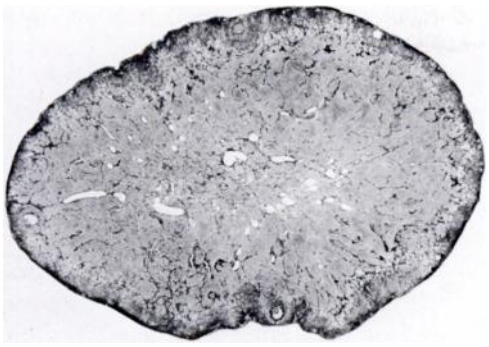

FIGURE 4. Section of ovary of an 11-yr-old fisher with luteinized interstitial tissue filling the medulla. H&E, ×4.

rons in the cerebrum, medulla, and cerebellum. There were focal areas of fatty change in the renal tubular epithelium and multifocal microcalcinosis. Moderate hemosiderosis was observed in the mesenteric lymph node and spleen, and there was diffuse karyomegaly of cardiac muscle nuclei.

Members of the Mustelidae are susceptible to a number of parasitic and infectious diseases which have been well documented (Davis et al., eds., 1981, Infectious Diseases of Wild Mammals, Iowa State University Press, Ames, 421 pp.; Davis and Anderson, eds., 1971, Parasitic Diseases of Wild Mammals, Iowa State University Press, Ames, 364 pp.). It may be assumed that fishers are similarly susceptible, but Strickland et al. (1982, op. cit.) reported only the occurrence of Aleutian disease (5.5%) and leptospirosis (2.5%) in fishers from their study, in addition to parasitic diseases.

Spontaneous neoplasms affecting wild mammals have been reported infrequent-

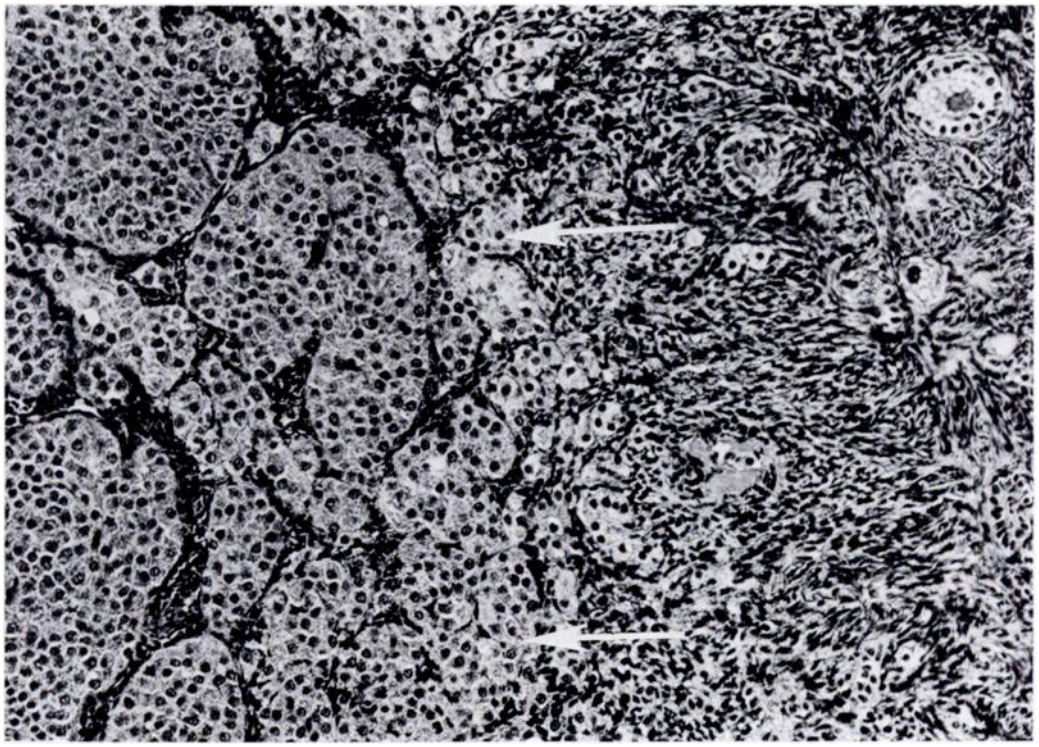

FIGURE 5. Section of ovary of an 11-yr-old fisher showing clusters of luteinized cells adjacent to the cortex (arrows) which contains a few resting oocytes. H&E, ×100.

ly and only viral neoplasms occur with any apparent significant prevalence (Clark, 1973, Southwest. Vet. 26: 185–188). The adenomas of the thyroid in this 11-yr-old fisher agree with the observations of thyroid neoplasia in captive wild mammals, predominantly in older carnivores (Schlumberger, 1955, Brookhaven Symp. No. 7, pp. 168–191). Fisher longevity in the wild is usually less than 10 yr (Powell, 1982, The Fisher; Life History, Ecology, and Behavior, University of Minnesota Press, Minneapolis, 217 pp.). The oldest fisher in a recent survey in this laboratory of 396 trapper-harvested fishers was 7 yr.

The microscopic characteristics of the adenomas in the fisher were comparable to follicular adenomas of the canine thyroid (Leav et al., 1976, Am. J. Pathol. 83: 61–122) but had both small (microfollicular) and large (macrofollicular) irregular follicles containing varying amounts of colloid. Bilateral involvement was present in the fisher, but is uncommon in dogs and cats (Leav et al., 1976, op. cit.). Thyroid function was not assessed and clinical signs were not specific enough to determine if the thyroid was hyper- or hypofunctional.

Luteinized interstitial masses in the ovaries of the owl monkey (*Aotus trivirgatus*) are composed of a foamy outer layer of steroidogenic pigmented cells derived from cortical stroma. An inner mass of smaller, darker, nonpigmented inactive cells are derived from the luteinized theca interna of involuted follicles (Hertig et al., 1976, Lab. Anim. Sci. 26: 1041–1067). The origin of the interstitial cells and hormonal function in the fisher is unknown. The histologic and morphologic changes observed in the uterus were indicative of luteal function. The cause of the bilateral ovarian luteinization in an aged female fisher with no history of breeding is unknown.

The animal was raised in captivity which allowed her to reach an age not normally achieved under natural conditions. A review of the literature revealed little information on naturally occurring diseases of fishers. Additional research into parasites and diseases is needed in order to more effectively manage this animal.

Paraffin-embedded blocks of the adenoma described herein have been deposited in the Armed Forces Institute of Pathology, Washington, D.C. 20306, USA (NERCWD #84:9478; AFIP #1962601).

Scientific Contribution No. 1082, Storrs Agricultural Experiment Station, University of Connecticut, Storrs, Connecticut 06268, USA. We thank Ms. Joyce Czikowsky for technical assistance.

Journal of Wildlife Diseases, 21(3), 1985, pp. 324–326

Papillomatous Lesions in Wild Juvenile Atlantic Salmon, *Salmo salar* L., in New Brunswick, Canada

Thomas G. Rand, Bermuda Aquarium, Museum and Zoo, P.O. Box 145, Flatts, Bermuda

In September 1979, 144 Atlantic salmon parr were captured in Catamaran Brook, a small tributary of the Little Southwest Miramichi River, New Brunswick, Canada (46°51'N, 66°11'W). Greyish-white or pink lesions up to 2.5 cm in diameter and 2 mm thick were on the body or fin surfaces of six of 144 (4.2%) of the specimens (Fig. 1). The lesions grossly resembled papillomata described in several species of fish (Roberts, 1978,

Received for publication 20 March 1984.