

OVA RETENTION IN FEMALE KOI (*Cyprinus carpio*)

Nick Saint-Erne, DVM

PetSmart, Inc.

Phoenix, Arizona USA

Saint-Erne@Q.com

Japanese Ornamental Carp

- Nishikigoi (Japanese for “brocaded carp”), or koi for short, are colorful variations of the common carp (*Cyprinus carpio*) that have been selectively bred in Japan for more than 200 years. In the last 50 years they have become very popular worldwide as ornamental fish. Koi can grow quite large (up to 100 cm) and live for many decades.
- Koi fish with perfect color patterns are valuable. There are koi shows held all over the world, and a show-quality koi can be worth thousands of dollars.
- For this reason, along with their longevity and endearing personalities, koi are one of the fish species most often presented to the veterinarian for treatment of diseases.

Sample Internet Advertisement from Koi.com

SAKAI SHOWA SOLD

Certified two year old Showa bred by Sakai of Hiroshima, daughter of "Blue Shadow". Features bold classic Sumi balanced by blood-red Beni.

Breeder: Sakai of Hiroshima

Size: 20 inches

Stock No: 10146

Price: \$2,200.00



Ova Retention Overview

- In the normal reproductive cycle, koi spawning occurs in the spring as the pond water temperature increases. Due to various factors, in some instances older female koi may not expel their eggs (ova, or roe).
- Retention of the egg mass (egg binding) can cause compression of the abdominal organs, kidney dysfunction that produces osmoregulation abnormalities (edema), and egg necrosis.
- Gonadal sarcomas also occur in koi and may be associated with ova retention.

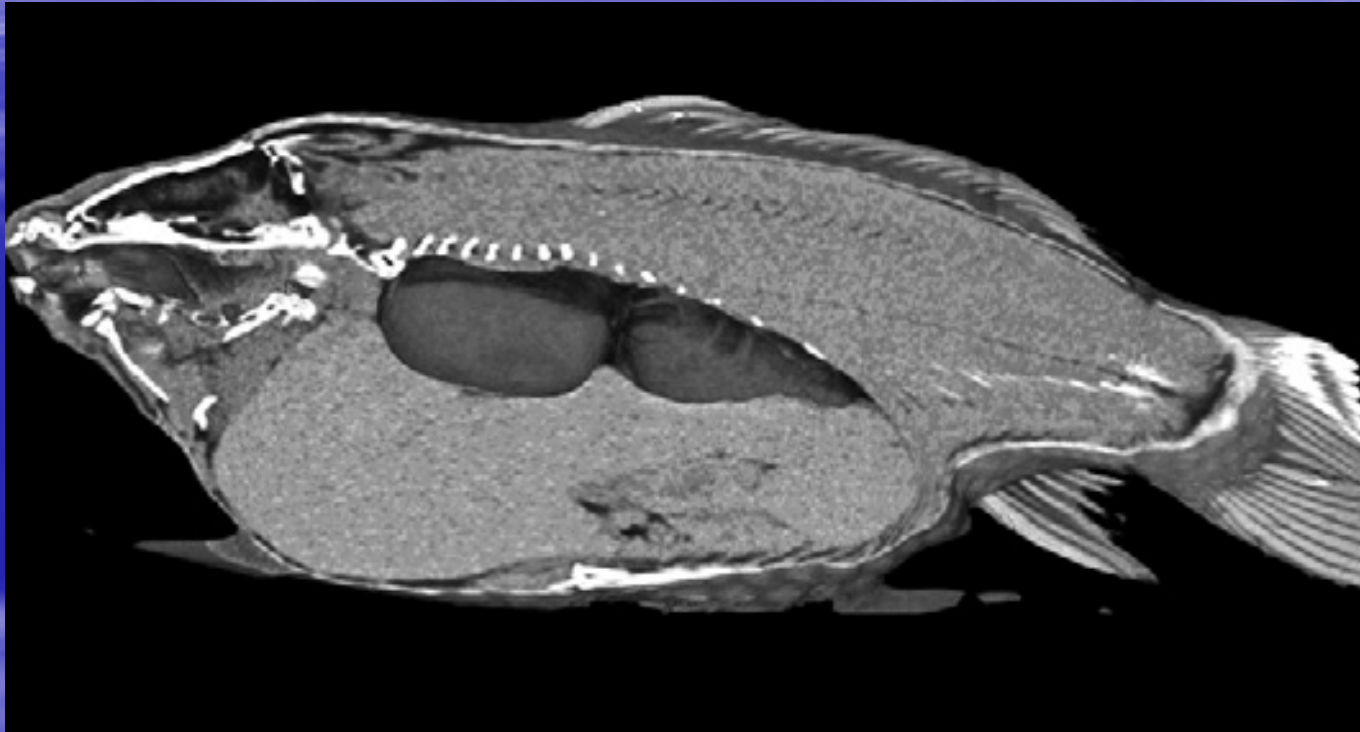
Nishikigoi Spawning Cycle

- Initiation of reproduction in koi is based on increased daylight in the spring and warming temperatures, which stimulate the release of gonadotropin hormones. When the water temperature reaches above 63°F (17.5°C), the koi start to spawn.
- Koi that are kept indoors or in a heated pond during the winter that do not go through the normal cool to warm water cycle may not be stimulated to spawn.
- Over time, unspawned eggs are normally reabsorbed in a female as egg production is at the expense of stored mesenteric fat. But in an overfed female koi, this reabsorption of the eggs may not occur, resulting in egg binding, or ova retention.

Signs of Ova Retention

- Abdominal distention and abnormal swimming behavior are some of the signs associated with ova retention.
- Signs can occur gradually over a long period, or appear suddenly, and the disease can progress to causing death.
- Diagnosis of ova retention can be made by radiography and sonography, as well as through laproscopy and exploratory surgery.

Computer-assisted Tomography Scan of a Female Koi



CT image of a gravid female koi, sagittal section. The large egg mass (roe) is visible below the two chambers of the gas bladder. The white spots above the gas bladder are cross sections of the ribs.

(Courtesy of Gregory A. Lewbart, MS, VMD, Dipl. ACZM, North Carolina State University College of Veterinary Medicine, Raleigh, NC.)

Female Koi with Abdominal Distention



Female Koi Euthanized for Necropsy



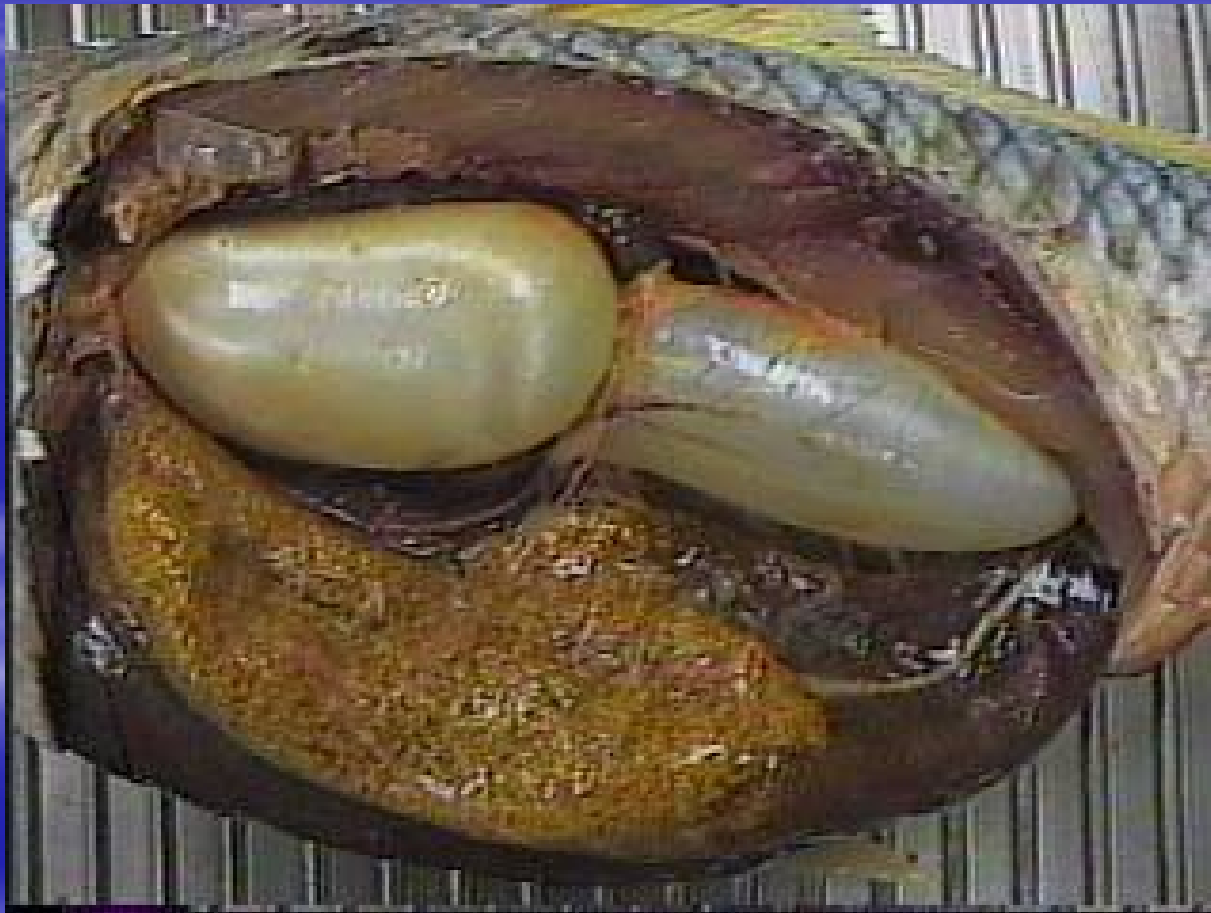
Huge Ovaries Compress Organs



Compression and Congestion



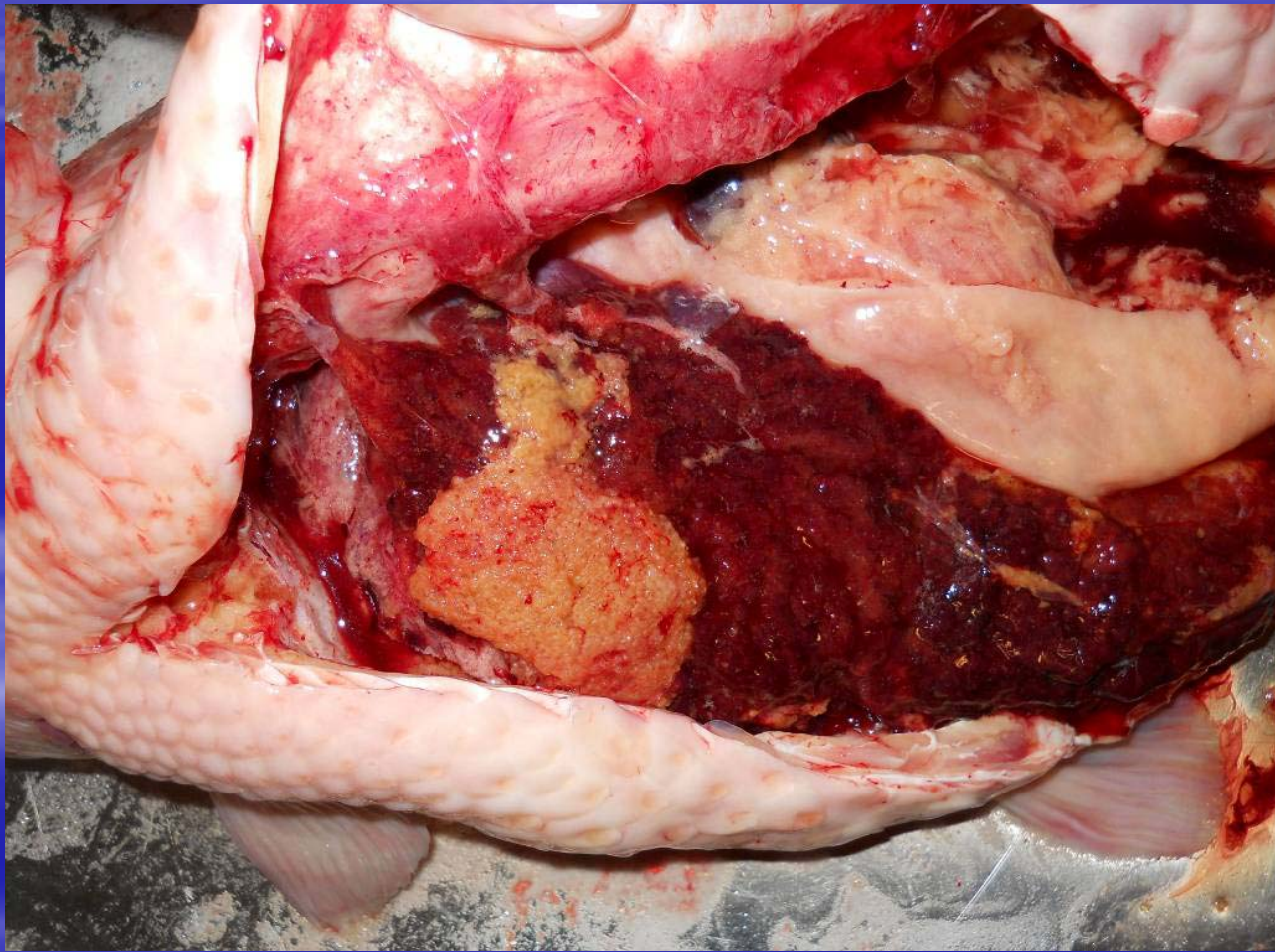
Normal Female Koi Coelom



Deceased Female Koi



Normal and Hemorrhagic Ova



Treatment Options

- Treatment can be provided through environmental manipulation to stimulate egg laying, or by use of hormonal stimulant injections and manually stripping the ova.
- Ovulation can be induced by injections of carp pituitary extract (2–5 mg/kg IM, repeat in 9–12 hours), human chorionic gonadotropin (20–30 IU/kg IM, given twice, 6 hours apart), or Ovaprim (salmon gonadotropin releasing hormone analog + domperidone). Ovaprim is dosed at 0.5 mL/kg of body weight, given IM or intracoelomically.
- In some cases surgical removal of retained ova has been successful.

Preventing Ova Retention

- Egg binding tends to occur in overfed, fatty koi. Reducing feeding after the normal spawning season so that females will reabsorb any remaining eggs may prevent egg binding.
- Environmental conditions should be monitored to ensure appropriate conditions for future normal reproduction cycles.
- Providing a cool-water period before spring can help produce a normal spawning cycle in fish that are otherwise kept in a warm pond in the winter.

Gonadal Sarcoma

- Neoplasms in fish are generally less aggressive and more differentiated than those in mammals. In fish, a malignant neoplasm often results in local invasion, and metastasis is uncommon.
- Neoplasms progress into space-occupying coelomic masses that can cause compression of the intestines, liver, or gas bladder and local tissue invasion. Necrosis will occur in the larger masses.
- Fish will survive for months with obvious abdominal distension. Surgical removal is often successful, but early intervention is important to prevent secondary complications (e.g., tissue necrosis, intestinal compression, bacterial infection) that lead to a poor prognosis.

Ovarian Sarcoma



Ευχαριστώ – Merci – Thank You

