Case 18
“Dan the man”
Nx 14 – 417

Mee Ja M. Sula, DVM, DACVP
Assistant Professor, Anatomic Pathology
University of Tennessee, College of Veterinary Medicine
This is Dan…

- Adult zebrafish (Danio rerio)

http://fishbase.org.cn/images/species/Darer_m0.jpg
This is Dan...

- Adult zebrafish (*Danio rerio*)
- Developed swelling over several months

http://fishbase.org.cn/images/species/Darer_m0.jpg
This is Dan…

- Adult zebrafish (*Danio rerio*)
  - Developed swelling over several months
  - Progressed to weakness and inability to stay afloat
This is Dan…

- Adult zebrafish (*Danio rerio*)
  - Developed swelling over several months
  - Progressed to weakness and inability to stay afloat

[Image of zebrafish]
DDX for coelomic swelling / inability to float

- Symmetrical enlargement
  - Renal disease (nephritis, polycystic kidney [goldfish])
  - Ascites
  - Swim bladder
  - Mycobacteriosiss
  - Egg binding
DDX for coelomic swelling / inability to float

- Symmetrical enlargement
  - Renal disease (nephritis, polycystic kidney [goldfish])
  - Ascites
  - Swim bladder
  - Mycobacteriosis
  - Egg binding

- Asymmetrical enlargement
  - Neoplastic
    - Hepatobiliary, Intestinal, Reproductive
GROSS FINDINGS

Asymmetrical coelomic swelling
GROSS FINDINGS

18 x 24 x 9 mm firm, white-tan, homogenous, subtly multilobulated mass in the caudal coelom
MICROSCOPIC FINDINGS
Testicular mass

swim bladder
Normal Testicle 40x

Sertoli cells
Normal Testicle 40x

Secondary Spermatogonia
Normal Testicle 40x

Maturing Spermatids
Affected Testicle 40x

Secondary Spermatogonia
Affected Testicle 40x

Maturing Spermatids
Affected Testicle 100x
Final diagnosis

- Testicular germ cell tumor (seminoma)
Spermatocytic seminomas

• Most common spontaneous neoplasms of zebrafish
Spermatocytic seminomas

- Most common spontaneous neoplasms of zebrafish
- Neoplastic cells are primary spermatogonia
  - Subpopulation mature
    - No spermatozoa
Spermatocytic seminomas

• Most common spontaneous neoplasms of zebrafish
• Neoplastic cells are primary spermatogonia
  • Subpopulation mature
    • No spermatozoa
• Vs. classical seminoma
  • Monotonous population of primordial germ cells

http://www.uoguelph.ca/~rfoster/repropath/male/Male_canine/maledog_testis.htm#seminoma
Other spontaneous neoplasms

- Bile duct: hyperplasia, adenoma, adenocarcinoma
- Pancreatic: islet adenoma or exocrine pancreatic
- Leukemia / lymphoma
- Hepatocellular
- Intestinal
Other spontaneous neoplasms

- Bile duct: hyperplasia, adenoma, adenocarcinoma
- Pancreatic: islet adenoma or exocrine pancreatic
- Leukemia / lymphoma
- Hepatocellular
- Intestinal

- Even highly malignant tumors rarely metastasize
Zebrafish in biomedical research
Zebrafish in biomedical research

- Spontaneous testicular neoplasia in man
  - Seminoma most common in aged 20-40
    - Classical in young men
    - Spermatocytic in men > 50yo

Zebrafish in biomedical research

- Spontaneous testicular neoplasia in man
  - Seminoma most common in aged 20-40
    - Classical in young men
    - Spermatocytic in men > 50yo
  - Carcinogenesis studies
    - Dietary / husbandry
    - Specific toxicants
      - Hepatocellular adenoma
      - Proximal intestinal adenocarcinoma
      - Mesenchymal
        - Fibroblasts, endothelium, cartilage, bone

QUESTIONS?

http://samrhodes.deviantart.com/art/Zebra-Fish-Finished-35243307
42nd Annual
CL Davis Gross Pathology Review Course

July 13-17, 2015
University of Tennessee
College of Veterinary Medicine
Knoxville, Tennessee