**Signalment:** Simba was a 7-year-old NM Rhodesian ridgeback at the time of presentation to VMSG.

**History:** Simba was evaluated by his primary veterinarian on 11/12/08 for abdominal distention of one week in duration. A large firm mass was palpated in the abdomen. Abdominal radiographs revealed a mass effect and suspected hemoabdomen. A CBC and chemistry revealed non-regenerative anemia, moderate thrombocytopenia, hypoalbuminemia, and a low total T4. Simba was referred to the VMSG emergency service the next day. Simba was neutered as a puppy (2/26/01); no records of the castration were available.

**Clinical Exam:** On physical examination, Simba was depressed. He weighed 45.3 kg and had a body condition score of 6/9. He had slightly tacky mucous membranes, mildly decreased tear film, adequate femoral pulses, and severe abdominal distention with a large firm mass palpable ventrally.

**Laboratory Findings:**

<table>
<thead>
<tr>
<th>Date</th>
<th>PCV (%)</th>
<th>TS (g/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/13/08</td>
<td>33</td>
<td>6.0</td>
</tr>
<tr>
<td>11/14/08 (7am)</td>
<td>36</td>
<td>5.8</td>
</tr>
<tr>
<td>11/14/08 (6pm)</td>
<td>17</td>
<td>3.0</td>
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<tr>
<td>11/15/08</td>
<td>15</td>
<td>3.9</td>
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<tr>
<td>11/16/08</td>
<td>20</td>
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<td>11/17/08</td>
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<td>5.0</td>
</tr>
<tr>
<td>11/18/08</td>
<td>30</td>
<td>6.0</td>
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</tbody>
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Additional pertinent findings:

11/13/08:
- CBC: Hct 32.2, Plt 50K, neut 14.21K
- Blood smear: 2–5 hpf (average), 45K estimated
- PT/PTT: 12, 83 seconds
- Abdominal fluid analysis: SG 1.017, TS 1.9 g/dl, non-degenerate, non-septic pyogranulomatous inflammation
- Histopathology of abdominal mass (11/24/08): Polygonal to spindle cell tumor, anaplastic (strongly favor sertoli cell tumor). In most of the mass, the cells lack identifying architectural patterns. In some areas; however, there is distinct lobule and duct formation and palisading morphologically reminiscent of Sertoli cell tumor. Anaplastic carcinoma; however, cannot be ruled out. Update: Immunostaining confirmed Sertoli cell tumor.

**Diagnostic Imaging:**

Pre-operative:
- Abdominal ultrasound (11/13/08): Expansive mass extending past apex of urinary bladder and small volume peritoneal effusion; suspect hepatic in origin.
- Echocardiogram (11/13/08): No recorded abnormalities.

5 weeks post-operative:
- Abdominal ultrasound (12/22/08): Abdominal masses (> 15, variably sized 2 to 5 cm) and moderate volume peritoneal effusion.

**Diagnosis:** Sertoli cell tumor

**Treatment/Management:** After a complete physical exam and discussion with the owner regarding the suspected hepatic mass, comprehensive thoracic radiographs were taken, which revealed no metastatic disease. The patient was started on IV crystalloids and monitored overnight for progressive pallor, anemia, and arrhythmias. Pain was controlled with 0.05 mg/kg IV hydromorphone q6-8h. The patient was cross-matched for possible peri-operative transfusion (pRBCs). An exploratory laparotomy was performed 11/14/08. A massive (7.5 kg) irregular mass with omental adhesions, suspected to be a retained testicle, was removed. Its venous drainage was from the right testicular vein, and there was a large arterial plexus supplying the mass that originated in the area of the caudal pole of the right kidney. Multiple enlarged mesenteric lymph nodes were observed. All other abdominal organs appeared grossly normal. Intra-operative hypotension developed (MAP < 50 mmHg), was treated with dopamine and dobutamine CRIs, and precluded biopsy of the mesenteric lymph nodes. Intra- and post-operative pRBCs (250 ml), fresh frozen plasma (240 ml) and hetastarch were administered. The patient was maintained on a ventilator intra-operatively. Pain was managed peri-operatively with a fentanyl CRI. An indwelling urinary catheter was placed immediately post-operatively.

**Post-operative care:** Overnight, Simba’s MAP remained > 90 mmHg, and his CVP ranged from 0-7 cm H2O. He was weaned off the dopamine CRI. An additional 240 ml of pRBCs were transfused. Pain was managed with IV hydromorphone as needed. The PCV
dropped from 23% to 17% 1-day post operatively, so a third transfusion of 240 ml of pRBCs was given. Accelerated idioventricular rhythm was noted throughout the day, but no pulse deficits were palpated. Therapy included tramadol, famotidine and Cerenia®. The anemia continued to improve daily, rising to 36% on 11/20/08. Thrombocytopenia persisted and appeared consistent with immune-mediated thrombocytopenia (IMT); and was treated with prednisone and cyclosporine starting on 11/18/08. Simba was discharged on 11/21/08 with instructions to remove skin staples in one week, recheck CBC in two weeks, and schedule a consultation with an oncologist pending biopsy results.

**After discharge:** Chemotherapy was not considered essential due to the low metastatic potential of Sertoli cell tumors and was not pursued by the owner. Simba did well at home until his platelet count dropped to 24K. He developed diarrhea then began vomiting. Simba returned for an appointment on 12/22/08. An AUS at that time revealed multiple abdominal masses and moderate peritoneal effusion, consistent with metastatic neoplasia. The owner elected humane euthanasia that day.

**Discussion:** Testicular tumors are common in dogs and humans [1]. They account for 90% of all cancers arising from the canine male genitalia and primarily affect geriatric patients [2]. Primary testicular tumors may be derived from three specialized testicular elements: interstitial Leydig cells, sustentacular Sertoli cells and spermatic germinal epithelium. Malignant transformation of these elements occurs with equal frequency, giving rise to interstitial cell tumors (ICT), Sertoli cell tumors (SCT), and seminomas (SEM) respectively [2]. De novo formation of multiple testicular tumors in the same patient is common; roughly 40% of dogs diagnosed with testicular cancer have more than one primary testicular tumor [2].

Several factors are believed to influence the development of testicular tumors, including cryptorchidism, age, breed, and exposure to environmental carcinogens [2]. Boxers, German shepherd dogs, Afghan hounds, Weimaraners and Shetland sheepdogs appear to have an increased risk of developing primary testicular tumors. Both Sertoli cell tumors and seminomas are associated with intra-abdominal or inguinal cryptorchidism [2]. The incidence of SCT is more than 20 times higher in cryptorchid than in scrotal testes [3]. One study revealed 54% of SCT diagnosed in intact male dogs developed in cryptorchid testes [2]. Simba was presumably cryptorchid.

Most primary testicular tumors in dogs remain locally confined, with a rate of metastasis less than 15%. When seen, metastatic lesions typically involve regional lymph nodes, skin, liver, lungs, and spleen [2]. Although metastasis is uncommon, it occurred in Simba’s case and may have resulted from the chronicity of the mass or its anaplastic nature. The tumor’s size likely reflects growth over several months. The size of the mass also presented specific peri-operative challenges. Removal of such a substantial mass inherently involves removal of a large percentage of the patient’s blood volume, which contributed to Simba’s anemia, hypovolemia, and hypotension. Large abdominal masses also place pressure on the caudal vena cava, impairing venous return and contributing to hypotension. Aggressive resuscitation with blood products, synthetic colloids, and crystalloids is often necessary as it was in this case. Surgical removal of Simba’s tumor alone resulted in a loss of more than 16% of his total blood volume [5]. Subsequent hypotension was responsive to dopamine and dobutamine.

Sertoli cells normally aid in the formation of the blood-testis barrier and produce hormones, including estrogen and inhibin. Estradiol-17β concentrations are significantly higher in dogs with SCTs, and these dogs have lower levels of testosterone than normal [2]. Reductions in the testosterone/estradiol ratio are attributed to clinical feminization [2]. Clinical signs hyperestrogenism include symmetric alopecia and hyperpigmentation, gynecomastia, galactorrhea, and atrophic penis [2]. Simba’s mild gynecomastia was visible after surgery. His owner reported that Simba displayed some feminine behaviors including female posturing during urination. Hyperestrogenism may result in reversible hematologic abnormalities, manifesting as pancytopenia [4]. Simba’s thrombocytopenia may have been due to hyperestrogenism or may have been immune-mediated secondary to neoplasia. Sertoli cell tumors arising from intra-abdominal cryptorchid tests are most commonly associated with hyperestrogenism [2]. Less common clinical signs associated with primary testicular tumors include hematuria, spermatic cord torsion, and hemoperitoneum [2].

**Figures:**
1) Figure 1. Simba post-op.
2) Figure 2. Example of gross appearance of a Sertoli cell tumor. (Noah’s Arkive, UGA)

**References:**