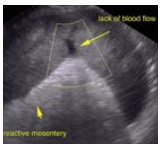

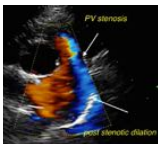

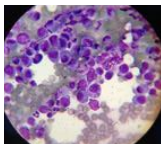
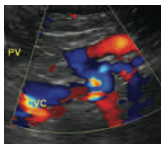

SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT

Jasper Finley

SPECIES

Canine

BREED

Terrier Mix

SEX

Neutered male

AGE

10 years

WEIGHT

34 lbs

INTERPRETED BY

Eric Lindquist, DMV DABVP, Cert. IVUSS

IMAGING PERFORMED BY

Dr. Mack

HOSPITAL NAME

Northside VC

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PRESENTING CLINICAL SIGNS

History: Patient present for dribbling urine and UTI symptoms, especially when sleeping. Urine stream is normal and patient is able to urinate without issue EVH
Abnormal PE/Chem/CBC/UA Results: Mild ALT and ALKP elevation. UA showed RBC, WBC and bacteria on 3/25/22. Recheck UA on 4/5 show UTI resolved bacteria on Enrofloxacin but RBC and WBC still present, and owner said patient is still dribbling urine

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The cystourethral junction, urethra, and prostate revealed irregular tissue thickened with areas of mineralization. The prostate measured up to 2.2 cm. This is strongly consistent with prostatic carcinoma. Cavitation of the prostate is also noted with fluid. The cavity measured approximately 2 x 1.5 cm within the prostate. The **bladder** itself was unremarkable. Regional inflammation was noted.

The **kidneys** revealed normal size and structure, corticomedullary definition and ratio for this age. The cortices presented largely uniform texture with normal echogenic relationship to liver and spleen. Medullary structure differed distinctly from the cortex and no evidence of pelvic dilation was present. The capsules were acceptably uniform without significant irregularities. Both kidneys measured 6.0 cm.

Adrenal Glands

The left **adrenal gland** was uniform and measured 0.5 cm. The right adrenal gland was visualized obliquely and measured 0.8 cm at the caudal pole.

Spleen

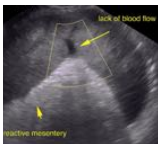
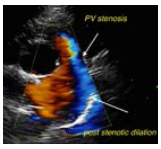
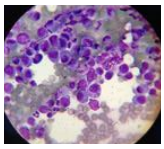
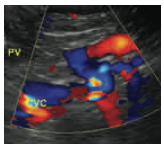
The **spleen** presented a smooth homogeneous parenchyma hyperechoic to liver and renal cortical parenchyma. The capsule was smooth without noticeable expansion or deviation from within the spleen or adjacent pathology. The splenic vasculature demonstrated normal volume without signs of congestion or thrombosis. No sonographic evidence of acute or chronic inflammatory, neoplastic, or infarctual changes was noted.

Liver

The **liver** images from right and left intercostal as well as subcostal views revealed subjectively normal liver size, contour, and structure. Some age-related parenchymal remodeling was noted but likely not clinically significant at this time. Vascular and biliary tracts were of normal volume and no evidence of congestion was noted. The gallbladder presented some dependent debris with essentially normal contour. The cystic and common bile ducts were normal. No overt evidence of active inflammatory, infiltrative or regenerative pathology was noted but should be paired with current or past LE elevations regarding any clinical significance to this presentation. The hepatic lymph nodes were unremarkable.

Gastrointestinal

Examination of the **gastrointestinal tract** revealed a stomach and intestine free of stasis, of normal wall thickness, acceptable curvilinear mural detail, and peristaltic activity. Small and large intestine

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demonstrated normal luminal chyme and stool consistency respectively. No obstructive or overt infiltrative disease was noted. No associated abnormal lymphatic activity was noted.

Pancreas

The base and limbs of the **pancreas** were observed to be largely isoechoic to surrounding omental fat. Pancreatic duct and capsular contour were acceptably normal and parenchyma respected normal curvilinear patterns. No overt evidence of active inflammatory or neoplastic disease was noted.

ULTRASONOGRAPHIC FINDINGS

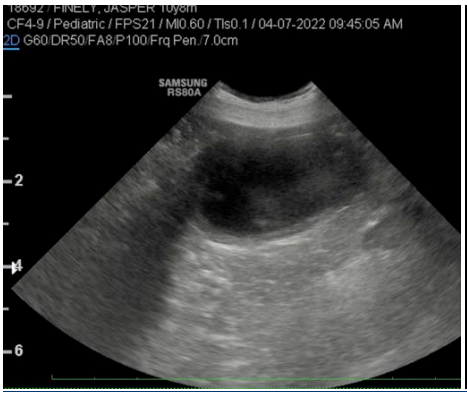
Prostatic/urethral mass, strongly consistent with carcinoma.

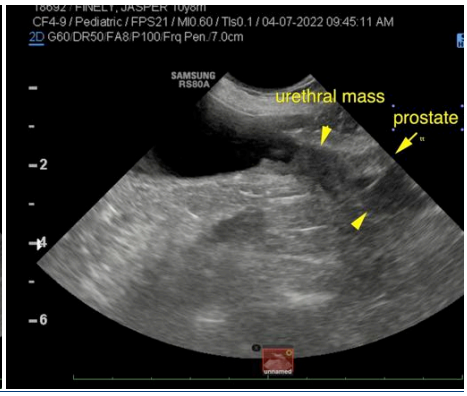
Mild hepatic remodeling.

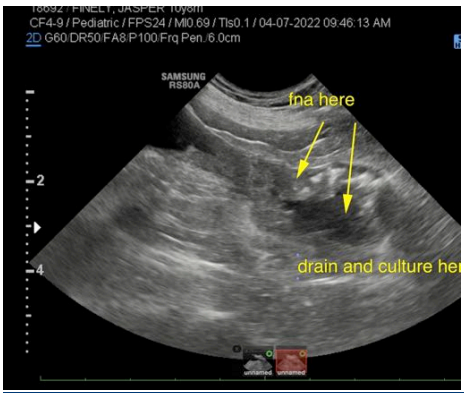
Otherwise, unremarkable abdomen.

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

Ultrasound-guided FNA of the parenchymal portion of the prostate and drainage of the cystic portion is warranted. There is a mild potential for tumor trailing. Otherwise, traumatic catheterization and ultrasound guidance can be obtained. However, it would not help in the drainage of the prostate. There is a mild potential for prostatitis and urethritis.







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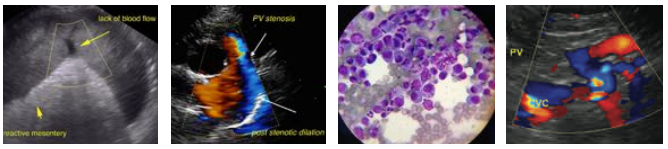

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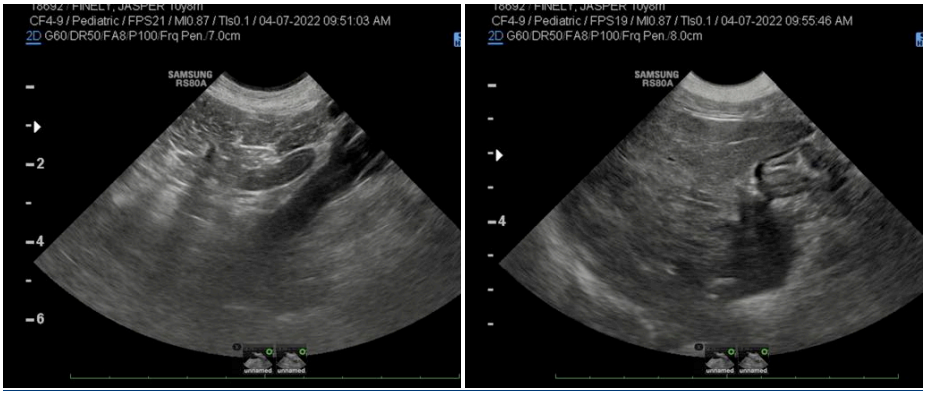
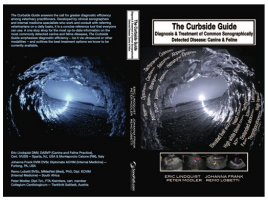


The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

Eric Lindquist, DMV, DABVP, Cert. IVUSS, CEO of SonoPath.com
info@SonoPath.com



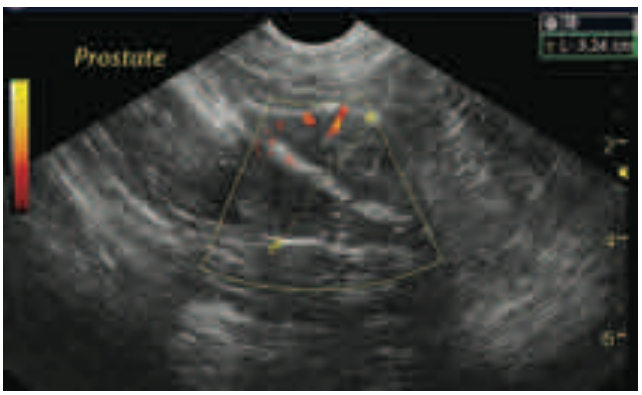
The following is an applicable excerpt from the *Curbside Guide to Diagnosis & Treatment of Sonographic Disease* offered by SonoPath.com Lindquist, Frank, Lobetti, and Modler.

An essential quick guide for every general practitioner and sonographer.

https://sonopath.com/products/curbside-guide-editing-due-release-12012015

Canine Prostatic Neoplasia

http://www.sonopath.com/ProstaticCarcinoma



Long axis of the prostate in a neutered male dog with prostatic carcinoma. The prostatic gland (between calipers) is significantly enlarged. Multiple hyperechoic foci consistent with mineralization are seen. Note the low echogenicity of the prostatic parenchyma rendering the urethral pathway relatively hyperechoic. Also note the presence of power Doppler signal in the organ periphery which is not seen in normal prostatic glands and benign prostatic hyperplasia.

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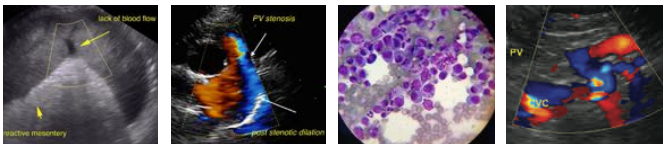

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Description: Prostatic neoplasia is frequently seen in dogs and can be diagnosed via ultrasonographic examination. The most commonly diagnosed prostatic neoplasms are adenocarcinoma and undifferentiated carcinoma. Transitional cell carcinoma (TCC) frequently spreads from the urinary bladder and urethra to the prostatic tissue (see the "Transitional Cell Carcinoma" chapter for more details). Metastatic squamous cell carcinoma, lymphoma, hemangiosarcoma, and leiomyosarcoma have been reported, but are less prevalent. Prostatic neoplasia has been documented in cats, but is quite rare.

Clinical Signs: Prostatic neoplasia presents in both neutered and intact males; however, a 2002 study suggested that neutered males were at greater risk for developing prostatic neoplasia than intact males. Typically, prostatic neoplasia is seen in older dogs (mean age of 10 years). Breed predilection includes mixed breed dogs, Shetland Sheepdogs, Dobermans, Scottish Terriers, and Airedale Terriers. Clinical signs and commonly reported signs from owners typically include: stranguria, frequent urinations, hematuria, dyschezia, weight loss, and decreased appetite. Other findings upon physical examination include fever, ataxia, pain upon rectal examination, and pain upon spinal palpation.

Diagnostics: Ultrasonographic examination should be performed if prostatic neoplasia is suspected. Common ultrasonographic findings include an enlarged, irregular prostate that typically has a hypoechoic appearance. Multifocal, poorly coalescing hyperechoic foci are also seen in prostatic malignancies. Hyperechoic foci are due to mineralization of the prostate; they cause far field shadowing. Cystic components can also be observed and are thought to indicate abscessation and/or necrosis. It can be difficult to differentiate chronic bacterial prostatitis from a prostatic neoplasia; however, regional lymphadenopathy is much more common with prostatic neoplasia than it is with chronic bacterial prostatitis. Malignancies of the prostate have often metastasized by the time of diagnosis. Frequent sites of metastases include the sublumbar lymph nodes, the pelvis, lumbar vertebrae, and the lungs. If metastases to the pelvis or lumbar vertebrae have occurred, bony lysis will often be noted radiographically. Metastasis to the liver, brain, kidney and spleen may occur. A definitive diagnosis of a prostatic neoplasm can be achieved through biopsy as well as fine needle aspiration (FNA) or through ultrasound-guided traumatic catheterization.

A complete and thorough workup includes a CBC, biochemical profile, urinalysis, as well as three radiographic views of the thorax, an abdominal ultrasound, and an ultrasound-guided prostatic biopsy or FNA, if indicated. Urinalysis may reveal hematuria and pyuria. Prostatic fluid analysis can also be helpful in identifying neoplastic cells.

Treatment: Unfortunately, once diagnosed, prostatic carcinoma offers a poor prognosis; prostatectomy, chemotherapy, and radiation therapy have proven unsuccessful in improving quality or length of life. Nonsteroidal anti-inflammatory drugs (NSAIDs), such as deracoxib, meloxicam, and piroxicam, have been used for their palliative, anti-neoplastic properties with prostatic carcinomas. Certain tumors, including various carcinomas (e.g. TCC, prostatic carcinoma, mammary carcinoma, squamous cell carcinoma) overexpress COX-2, which converts arachidonic acid to prostaglandin G2 (PGG2)/prostaglandin H2 (PGH2), and ultimately to prostaglandin E_2 (PGE_2). The metabolite, PGE_2, is associated with increased inflammation, tumor invasiveness, angiogenesis, and reduced apoptosis. In vivo and in vitro, NSAIDs inhibit COX-2, resulting in the suppression of PGE_2, and thereby inhibiting tumor growth and metastasis. This effect has been achieved with both non-selective COX inhibitors as well as COX-2 inhibitors (the latter will suppress COX-1 at increased doses).

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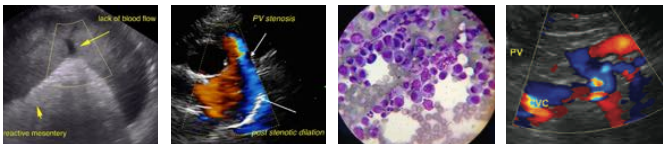

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WEIGHT

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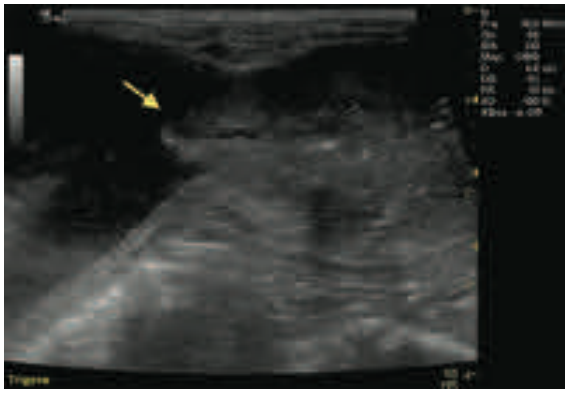
Some cases of prostatic carcinoma are managed palliatively with cyst/abscess ultrasound-guided drainage, antibiotic infusion, systemic antibiotics, and NSAID treatment and/or chemotherapy. Anecdotally, it has been observed that patients that often present clinical signs of hematuria or dysuria owing to cyst or abscess formation may be treated with repeat ultrasound-guided drainage. This appears to work especially well if there is a considerable cystic component to the prostatic tumor. The key is to image the prostate adequately, drain any cysts that are present, sample the abnormal parenchyma (FNA or biopsy), and potentially infuse antibiotics directly into the cystic cavities if a suppurative fluid is retrieved. The patient should be monitored clinically over time and reevaluated to see if cysts recur. Every case responds differently to treatment, and the behavior of parenchymal and cystic growth will vary.

Currently, investigational studies involving fluoroscopic-guided direct chemotherapeutic embolization through the iliac arteries as well as urethral stent placement are offered by select tertiary veterinary facilities that have an interventional radiology department. Ultrasound-guided endoscopic diode laser ablation through a perineal urethrostomy is also being attempted as a salvage and palliative procedure.

Conclusion: Prostatic neoplasia is more commonly detected in neutered male dogs than intact males. Diagnosis is typically obtained using ultrasound, cytology, and histopathology. Unfortunately, traditional therapy typically yields a guarded to poor long-term prognosis, but palliation with NSAIDs and/or chemotherapy can temporarily improve clinical signs. Investigational techniques may provide additional therapeutic options but are currently experimental.



Long axis of the prostate in a dog with prostatic carcinoma with cystourethral junction to the left. Note the typical “starry sky” pattern of prostatic carcinoma with multiple echogenic foci representing mineralizations (arrow) on a relatively hypoechoic background created by the neoplastic infiltrate. Considerable vascularity is present throughout the parenchyma noted on power Doppler.

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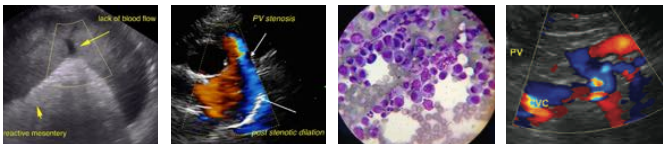

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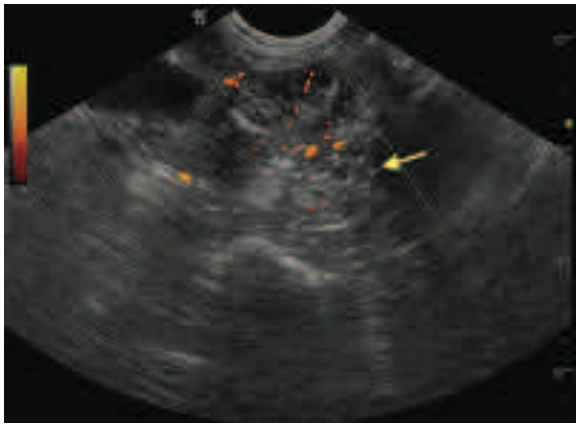

Long axis of the prostate in a dog with prostatic carcinoma during ultrasound guided sampling. The prostatic mass is largely isoechoic to surrounding fat in this particular example and can easily be missed without correct gain and focal point adjustments. The needle trajectory is seen as a weakly echogenic interface (arrowheads). Note the echo yield is limited technically by the steep insonation angle here. Note the sharp deviation of the descending colon owing to the prostatic mass effect upon it (arrow). This colonic deviation was a key point toward identifying this isoechoic prostatic mass in this case.

Long axis of the prostate in a dog with prostatic carcinoma during ultrasound guided sampling. The prostatic mass is largely isoechoic to surrounding fat in this particular example and can easily be missed without correct gain and focal point adjustments. The needle trajectory is seen as a weakly echogenic interface (arrowheads). Note the echo yield is limited technically by the steep insonation angle here. Note the sharp deviation of the descending colon owing to the prostatic mass effect upon it (arrow). This colonic deviation was a key point toward identifying this isoechoic prostatic mass in this case.

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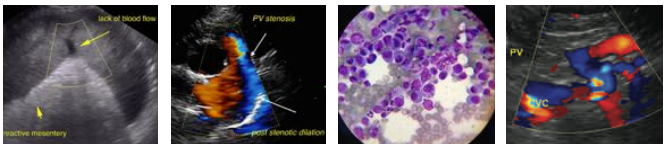

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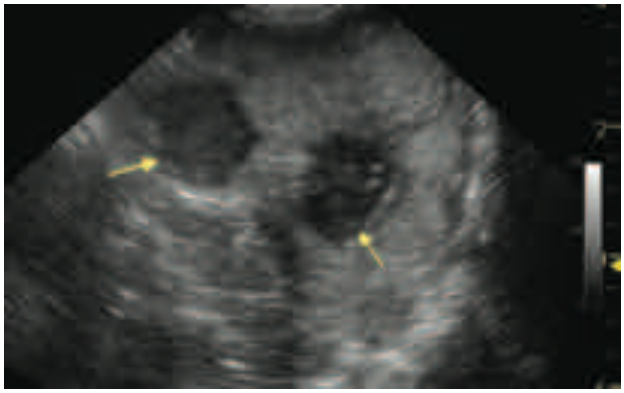
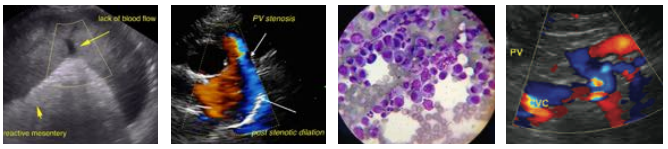
Long axis of the prostate in a neutered male dog with prostatic carcinoma. Note that prostatic carcinomas are not necessarily large and commonly similar in echogenicity and echotexture as compared to the surrounding peritoneal fat. Proper scanning technique tracing the bladder neck and urethra is essential not to miss the lesion.

Short axis of the prostate in a dog with cystic prostatic carcinoma. Multifocal intraparenchymal cyst-like lesions with anechoic to hypoechoic content are seen. Asymmetric enlargement is noted. The regular bilobed shape and typical dorsal notch are lost. The echotexture in this particular prostatic mass is reminiscent of the occasional prostatic lymphoma that can occur as exemplified in the next image.



Cross section of the prostate in a dog with enlarged irregular prostate. The regular parenchymal echoarchitecture is displaced by two well delineated hypoechoic nodules (arrows). Note the generalized swelling of the gland. The sonographic appearance resembles prostatitis and abscessation, yet the diagnosis was significantly different on USG FNA (prostatic lymphoma). Note: abscessation can be differentiated from proliferative nodules with power Doppler as signals are negative with abscessation or



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necrosis and typically positive with tissue proliferation.

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