



PATIENT PRESENTING CLINICAL SIGNS

PATIENT Subie Poirer
SPECIES Canine
BREED Boxer
SEX Spayed Female
AGE 9 Years
WEIGHT 36 kg

Recurrent urinary tract infections. Clinical signs of hematuria, stranguria. Has been on amoxy-clav more than one including higher dose and extended courses (2 weeks). BRAF test was negative for TCC. Patient will respond initially to antibiotics but then relapse.

Abnormal PE/Chem/CBC/UA Results: Culture results positive for Proteus mirabilis in May. Urine results show rod bacteria, struvite crystalluria, mild proteinuria, pyuria. Blood work unremarkable.

ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN

Urinary System

The urinary bladder is moderately distended with urine that has echogenic suspended debris. The Bladder wall is diffusely thickened, more so in the ventral wall, which measures 0.78 cm. Along this ventral wall there is a line of irregular increased echogenicity adjacent to the thickening, which is concerning for possible gas artifact (emphysematous cystitis). Sandy mineralization cannot be ruled out. In the area of the trigone/ureteral papillae there is some irregular focal thickening measuring 0.49 cm x 2.0 cm. No evidence of large calculi or an obstructive pattern is visualized.

The left kidney has a normal shape and size (7.21 cm). Overall echogenicity is slightly hyperechoic with poor corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of focal perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

The right kidney has a normal shape and size (7.39 cm). Overall echogenicity is slightly hyperechoic with poor corticomedullary distinction and a typical 1:3 cortex:medulla ratio. There is no evidence of focal perinephric inflammation or effusion. There is no evidence of pyelectasia, nephroliths, infarcts or hydroureter. Renal vasculature is normal.

Adrenal Glands

The left adrenal gland is normal in size measuring 0.52 cm at the caudal pole. It is observed in its normal position cranial to the left renal artery. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

The right adrenal gland is normal in size measuring 0.46 cm at the caudal pole. It is observed in its normal position between the cranial aspect of the right kidney and the caudal vena cava. It is normal in appearance (uniformly hypoechoic) and shape with no evidence of a mass effect.

Spleen

The spleen is subjectively normal in size, echotexture is homogenous, and the splenic capsule is smooth with no irregularities. The blood flow through the hilus and splenic parenchyma appears normal. No focal parenchymal abnormalities are visualized.

Liver

The liver is subjectively normal in size, and echogenicity with smooth peripheral margins. The parenchyma is homogenous echotexture. The visible portions of the vasculature and biliary tract appear normal. No focal nodules or cystic lesions are observed.

INTERPRETED BY

Kathleen Sennello DVM,
MS, Diplomate ACVIM
(Small Animal Internal
Medicine)

IMAGING PERFORMED BY

Dr. Sarah Barthelemy

HOSPITAL NAME

Fen Vet

REFERRING VET

Dr. Hammond

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7/5/23



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The gallbladder lumen is moderately distended. The wall of the gall bladder is not thickened and has a smooth mucosal surface. Luminal contents are mild and primarily anechoic. The cystic and common bile ducts are normal/not visible.

SPECIES

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Gastrointestinal

The stomach contains minimal luminal contents. It measures at a normal thickness of <0.7cm with some variability due to the presence of rugal folds. The distinction of the gastric wall layers is adequate and there is no impression of reduced peristaltic activity. No masses or focal lesions were observed.

BREED

Boxer

The visualized areas of duodenum, jejunum and ileum have a relatively uniform diameter with minimal fluid distension. Wall thickness is normal. Bowel loops follow a curvilinear path with distinct wall layering maintaining the typical 1:3 muscularis:mucosa layer ratio. Duodenum wall measures 0.50 cm. Jejunum wall measures 0.42 cm. Visualized peristalsis appears appropriate. There were no focal lesions consistent with obstruction or a mass effect observed.

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The ileocecal junction was visualized and exhibited normal intact wall layering and is subjectively of normal thickness. Sections of colon are visualized with formed fecal material and gas shadowing distally. There is no observed focal or generalized colon wall thickening or loss of layering.

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Pancreas

The pancreas is normal and isoechoic to surrounding mesentery. There is no evidence of nodules or cystic lesions. There is no evidence of regional mesenteric inflammation or fluid.

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Free Abdomen

Evaluation of the peritoneal cavity did not reveal any evidence of effusion, or subjective lymphadenomegaly. The Medial iliac nodes appear normal and there was no evidence of a caudal aortic thrombus at the bifurcation. The omentum is of normal uniform echogenicity.

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ULTRASONOGRAPHIC FINDINGS

- Diffusely thickened, irregular urinary bladder wall with an adjacent hyperechoic line, possibly suggestive of intraluminal gas – Findings are most consistent with diffuse severe cystitis +/- emphysematous cystitis. Correlate with urinalysis, culture, and abdominal radiographs, looking for gas.
- Questionable focal thickening in the area of the trigone – This can be an extension of the diffuse cystitis or less likely an early mass lesion.
- Decreased corticomedullary distinction in both kidneys – Mild loss of corticomedullary distinction in both kidneys could be consistent with chronic degenerative disease or interstitial nephrosis.

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INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The changes observed in the urinary bladder are most consistent with severe diffuse cystitis. There is questionable air artifact, which could be consistent with emphysematous cystitis. Correlate these findings with abdominal radiographs, looking for intraluminal gas.

Although this has the typical appearance of severe cystitis, a neoplastic process cannot be definitively ruled out without biopsies.



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Given the positive cultures, I would consider aggressive management for recurrent cystitis with recurrent cultures and sensitivities (sensitivity can change during treatment) guiding antibiotic administration and concurrent probiotic therapy (with probiotics administered at least two hours apart from antibiotic administration).

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Further evaluation looking for an underlying cause of the recurrent is recommended while keeping in mind that a negative urine BRAF test does not rule out neoplasia, it is a non-diagnostic test result.

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Repeat imaging should be performed while on antibiotic therapy (approx. 2 weeks into appropriate ab therapy -based on C&S) to ensure that the ultrasonographic changes are resolving and antibiotics should be continued (based on repeat culture and sensitivity results) until all ultrasonographic changes have resolved. If these changes do not all resolve, my concern for underlying neoplasia would greatly increase.

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These are my general recommendations for recurrent urinary tract infections:

If there is no evidence of a structural abnormality of the urinary tract to explain the recurrent urinary tract infections, this makes the likelihood of an ectopic ureter, diverticulum, or other congenital abnormality less likely. But unfortunately does not definitively rule them out.

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-Consider systemic causes such as diabetes, chronic renal failure, immunosuppression, cushings (steroid use) etc..

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-Consider external conformational issues such as recessed/hooded vulva, chronic neurologic disease interfering with urine emptying etc..

-Further evaluation with cystoscopy or CT could be considered as not all lesions are evident on ultrasound.

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-Recommend starting a probiotic, frequent walks, using wipes, cranberry supplement (if E.Coli infections) and frequent urine culture/urinalysis monitoring to target antibiotic therapy and the need for treatment. (asymptomatic bacteriuria Vs. bacterial cystitis)

If the infection is cleared and the bladder wall/mucosal lesions are persistent, then cystoscopy to obtain biopsies would likely be warranted.

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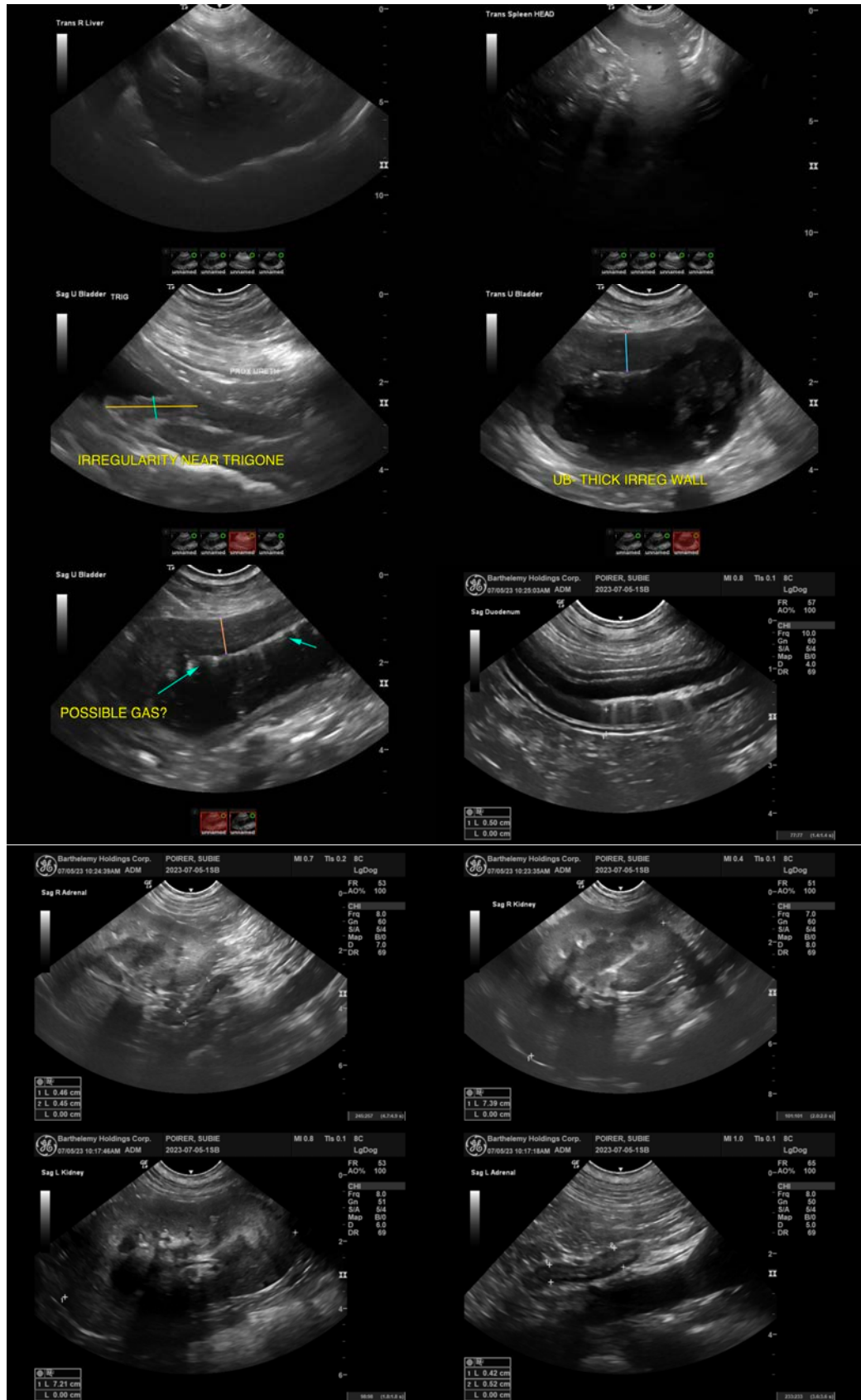
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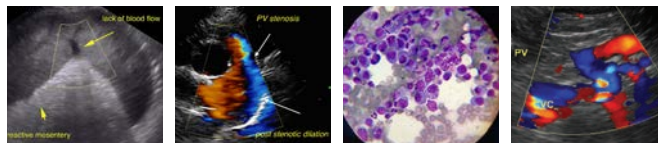
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

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.

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