

AN-NAJAH NATIONAL UNIVERSITY

ANIMAL HEALTH CENTER

CASE NO: 04

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DIAGNOSIS: Acute primary pyelonephritis

PYELONEPHRITIS

Definition : Infectious nephritis caused by bacterial infection of the kidney is usually an ascending infection from the lower urinary tract. Pyelonephritis is the most commonly diagnosed disease of the kidney in dairy cattle. Reported incidence in practice settings seems to far outnumber other renal diseases such as nephrosis and glomerulonephritis. This may be a true representation or merely supposed because of the relative ease of diagnosis of pyelonephritis as opposed to other conditions that require more ancillary laboratory data for diagnosis.

Etiology :

In cattle, bacterial pyelonephritis has been attributed to ascending infection of the urinary tract by *Escherichia coli* or *Corynebacterium renale* . At least three *C. renale* serotypes exist as normal flora of the caudal portion of the reproductive tract of female cattle and the sheath of male cattle.

Pathophysiology :

Unlike most gram-positive organisms, *C. renale* possesses pilli that promote attachment to and colonization of the urinary tract mucosa. Conditions that provide physical or chemical damage to the mucosa in

the lower portion of the urinary tract such as dystocia, bladder paralysis, or catheterization may predispose the cow to pyelonephritis as a result of *C. renale* ascending infection from the urinary bladder to the ureters and kidneys. *C. renale* causes a humoral antibody response when renal infection develops but not when infection is limited to the bladder. Because routine catheterization of cattle to assess urinary ketones has been abandoned, pyelonephritis caused by *C. renale* is seen less frequently, whereas pyelonephritis caused by gram-negative organisms is seen more frequently. Pyelonephritis as a result of *E. coli* infection has a similar pathogenesis to pyelonephritis caused by *C. renale* in that ascending infection from the lower urinary tract occurs following damage to the caudal portion of the reproductive tract.

Clinical Signs :

GPE showed the following:

1-fever of 39.7 to 40.8° C , **2**-anorexia ,**3**- decrease in milk production , **4**-colic manifested by kicking at the abdomen, **5**- restlessness, **6**- and treading. **7**- Signs of colic. **8**- swishing of the tail **9**- Stranguria, **10**- polyuria, **11**- arched stance, **12**- hematuria , **13**- blood clots, **14**- fibrin and pyuria also are observed.

Diagnosis :

Diagnosis of pyelonephritis is made by combining the clinical signs, rectal palpation findings, vaginal palpation findings, Ultrasonography and urinalysis.

- Urinalysis abnormalities RBCs, WBCs, protein, and bacteria were present.

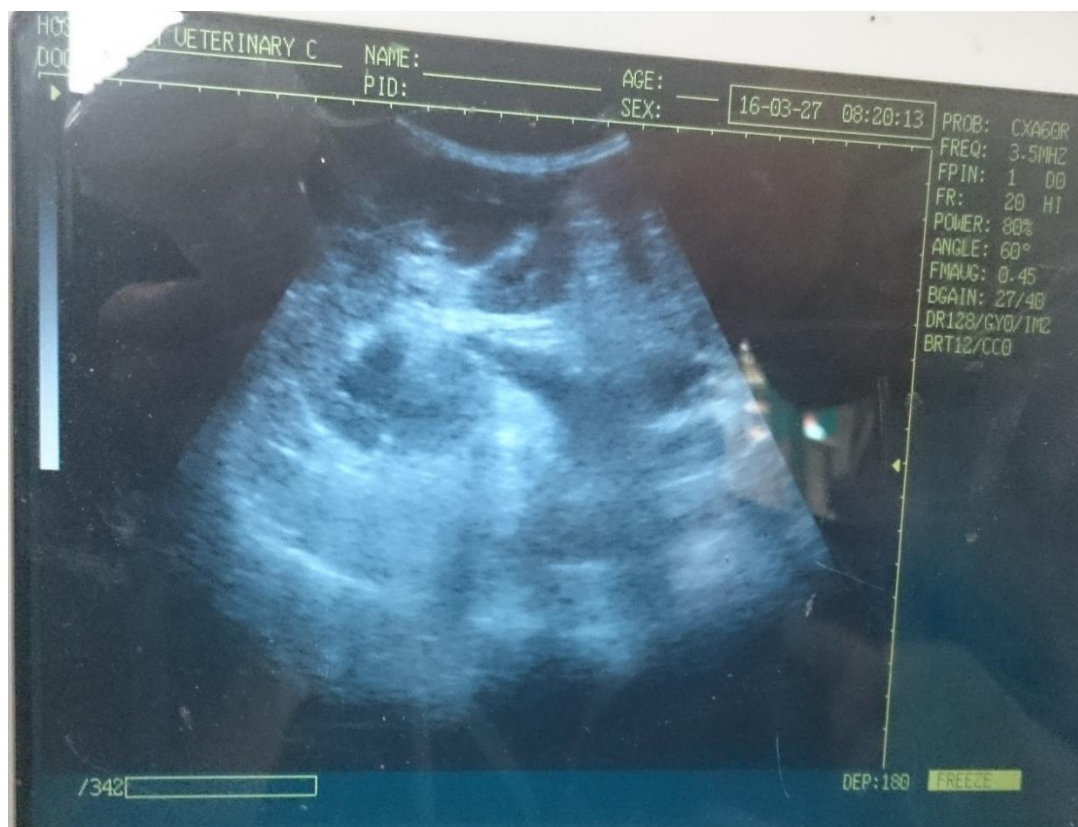
- Rectal palpation reveal enlargement of the left kidney, normal lobulations of the kidney was lost; the kidney feels “mushy”; and there was a pronounced arterial pulsation.
- Ultrasonography had been applied and shows the following two images below.

sonography of Bovine kidney

Animal No.:4

Date : 27.03.2016

Dr. Nimer Khraim





- Gross examination of the urine showed fibrin, blood clots, and pus are apparent in voided urine.
- Urine culture is the most important laboratory aid because it allows identification of the causative organisms and more importantly the sensitivity of the causative organism to antibiotics.

Clinical Pathology :

Clinical pathology findings reveals the following:

- Hypoalbuminemia, Proteinuria, Serum globulin values (≥ 5.0 g/dl). Generally a period of 10 to 14 days of renal infection is necessary to elevate globulin values.

- abnormalities have positive blood and protein reactions on reagent test strips, and urinalysis confirm the presence of RBCs, WBCs, protein, and bacteria.

Treatment :

- The causative organisms and their susceptibility to antimicrobial agents constitute the major economic decision involved in case management. After the organism is identified and antimicrobial susceptibility determined, an antimicrobial agent should be selected that maintains high concentrations in urine, is not nephrotoxic, and is approved for use in cattle. These guidelines may need to be compromised in occasional patients. For example , aminoglycosides may be indicated based on sensitivity results, but these agents possess the potential for nephrotoxicity .
- Penicillin, because of its urinary route of excretion, has an exponential concentration in urine versus plasma that may make the drug effective in vivo against some E. coli, which are resistant to penicillin in vitro.

Antibiotic Therapy :

- After a catheterized urine sample has been collected for culture, standard therapy in our clinic consists of penicillin (22,000 U/kg, intramuscularly [IM] every 12 hours), which is given until culture and susceptibility results are returned in 72 to 96 hours. When C. renale is identified, penicillin is continued for 3 weeks because the organism is uniformly susceptible to penicillin. If the disease is severe and peracute, IV penicillin may be administered for the initial treatment.

After treatment , ultrasonography applied and showed improvement of the case as in image below.

Sonograph of Bovine kidney

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