

Causes Related to Renal Failure in Camel (*Camillus dromedaries*)

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Abstract

This review article is written to describe the causes related to renal failure supported by the lab diagnosis and sometimes by Post-mortem and ultrasonography finding. Many cases were recorded with a renal failure and this common disease in Saudi Arabia and there are some causes like urine retention, Ruminal overload, long-term anti-inflammatory, cystitis, dehydration and hematuria are most common causes. In this article we will mention some cases with is lab finding and PM and sometime ultrasound examination.

Keywords: Camel; Kidney; Hydronephrosis

Introduction

The kidney in the dromedary camel play important role in the water conservation and has ability to concentrate urine and reduce its production up to 20% of normal the camel kidney able to produce very concentrated urine and this be little or no urea in the urine due to physiological urea recycling during period of dehydration also during dehydration the camel proximal renal tubules are capable of resorbing approximately 88% of water pass the glomeruli the camel kidney able to produce urine with twice salt content of the sea water.

Major causes

Urinary retention

Many camel show urine retention and there are many reasons like urolithiasis, urethritis and cystitis this are the most common reason sometime due to fibroma on the neck of bladder and prostate gland enlargement. The camel show signs of straining while adopting the urination position, tail flicking, and little or no urine voided. Hematuria may be observed and colic signs may be exhibited especially when urinary obstruction is complete.

1st case (urethritis)

Two years male camel admitted our hospital with complain in-appetite and colic signs and previously the owner feed it large

amount of parley so we suspect firstly to be acidosis lead to academia due to so we give fluid therapy to neutralize the academia after given fluid therapy we observed there is no urination suspected to be urethritis so by large dose of the antibiotic the camel urinate after two days but unfortunately when we made a blood analysis the creatinine reach (16.73) (normal range from 1.3 to 2.2) the renal failure occurred by ultrasound examination the kidney showed hydronephrosis

The right kidney shows hydronephrosis (Figure 1.1-1.3).

Figure 1.1

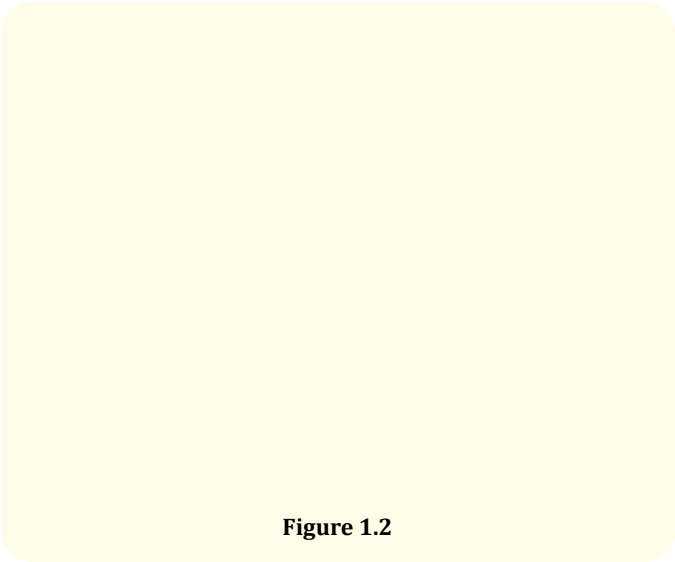


Figure 1.2

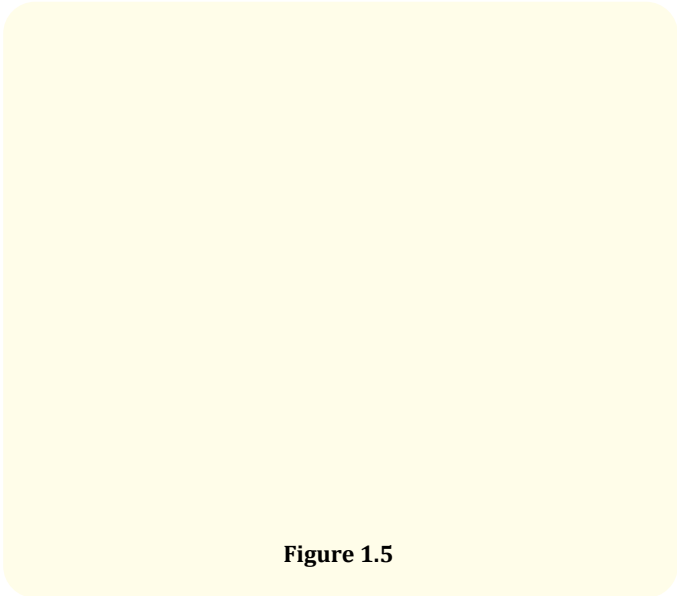


Figure 1.5

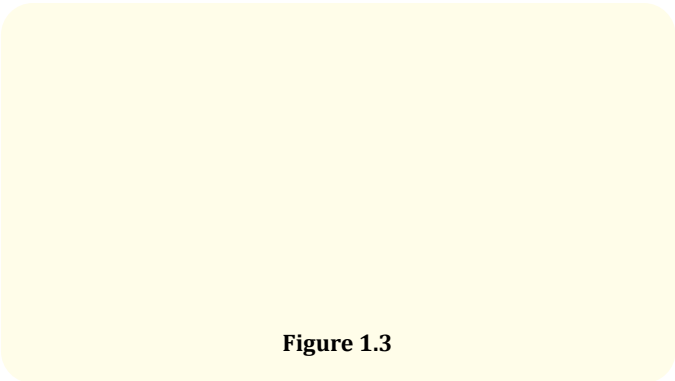


Figure 1.3

The left kidney shows hydronephrosis and pyelonephritis (Figure 1.4-1.6).

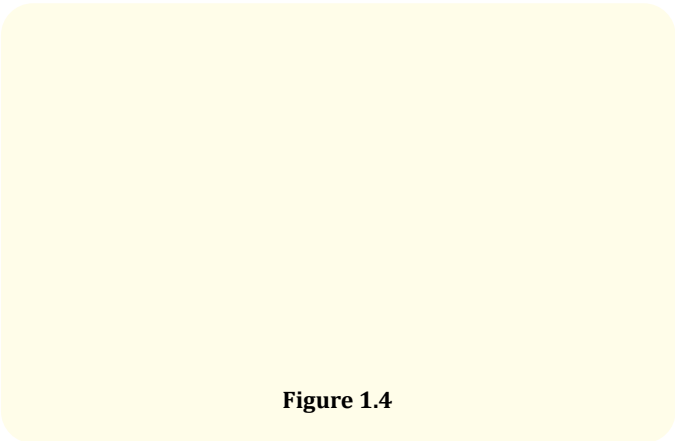


Figure 1.4

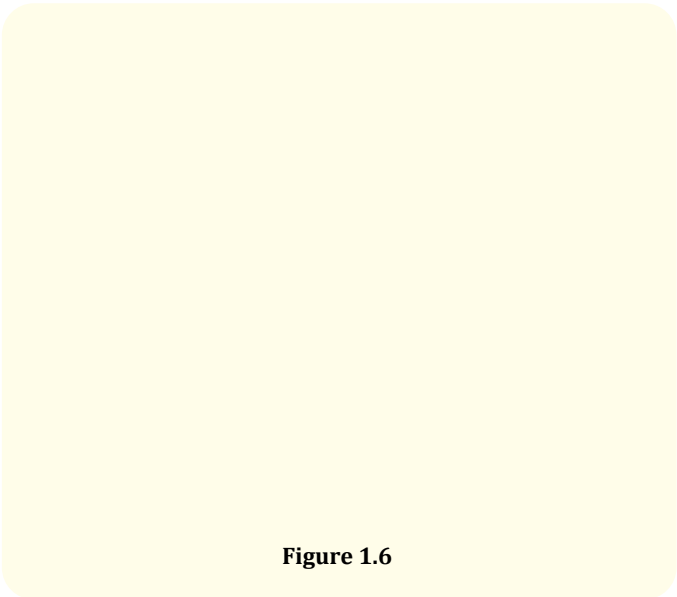


Figure 1.6

The first blood chemistry analysis (Figure 1.7).

The urine analysis shows high level of pus cells and blood cells (Figure 1.8).

After trying for three days to give fluid therapy for flushing the kidney and antibiotic and diuretics we made another analysis the result become more worst and the level of creatinine was rising

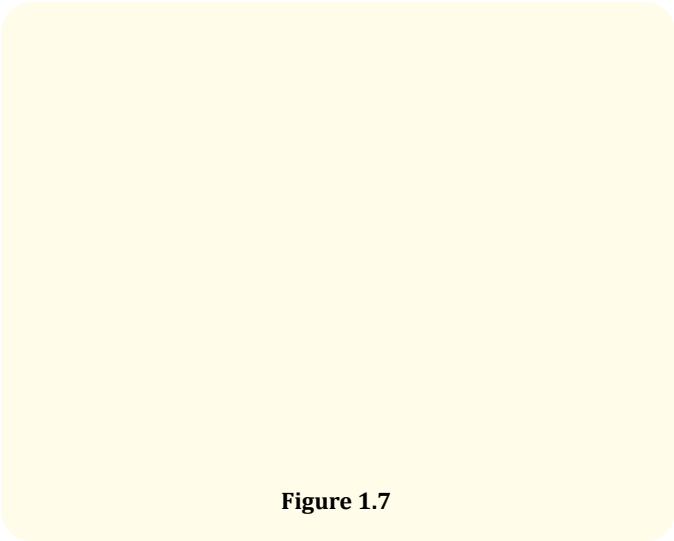


Figure 1.7

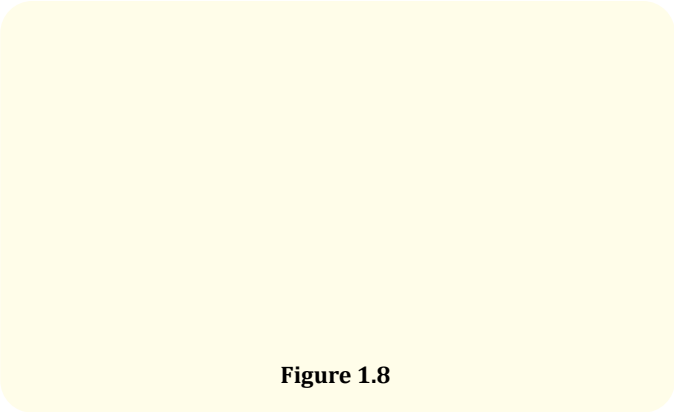


Figure 1.8

and animal become sever anemic (RBCS:5.2) may be due to damage of the kidney as responsible for production of the erythropoietin enzyme. after death of the camel we make PM. we found signs of toxemia may also due to pyelonephritis.

The second blood chemistry analysis (Figure 1.9).

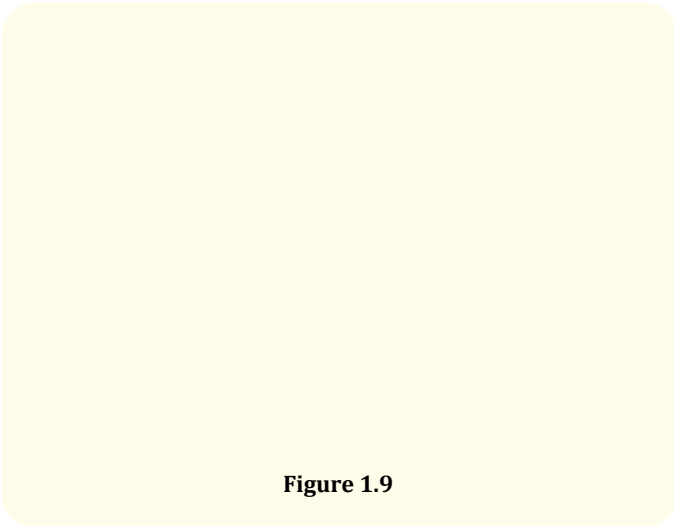


Figure 1.9

The left kidney shows great signs with pyelonephritis (Figure 1.10).

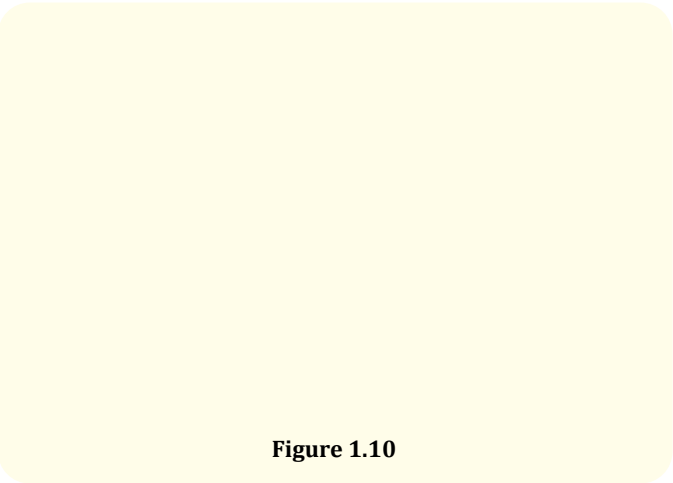


Figure 1.10

The right kidney shows signs of hydronephrosis (Figure 1.11).

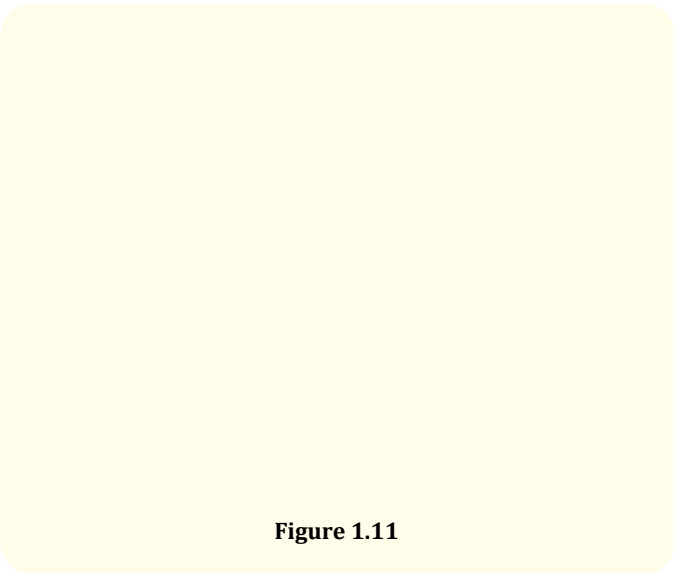


Figure 1.11

2nd case (prostate gland enlargement)

three years' age male camel admitted to our clinic with no urine production for two days and with case history of little urine voided for three weeks ago. During the examination we make elevation of the prepuce the camel able to voided very little amount of urine by making a friction of penis so if there are any crystal in urethra that delay urine output. Urine sample was taken to lab suspected to be urolithiasis and there is a crystal may be founded also blood sample was taken to check BUN. He lab show in urine analysis (crystals: nil) so recheck camel bull again by rectal examination the urinary bladder it was very extended by urine and there was a mass in the beginning of urethra it was prostate gland that are very large and making a pressure on dorsal aspect of the urethra that make

it closed and make urine retention. because this case suffer more than three weeks it show renal failure as the blood analysis show the (BUN: 40.9) and suspected due to the urine return to the kidney make hydronephrosis this case just die after 12 hours.

Urine analysis show no crystals and blood cells (Figure 2.1).

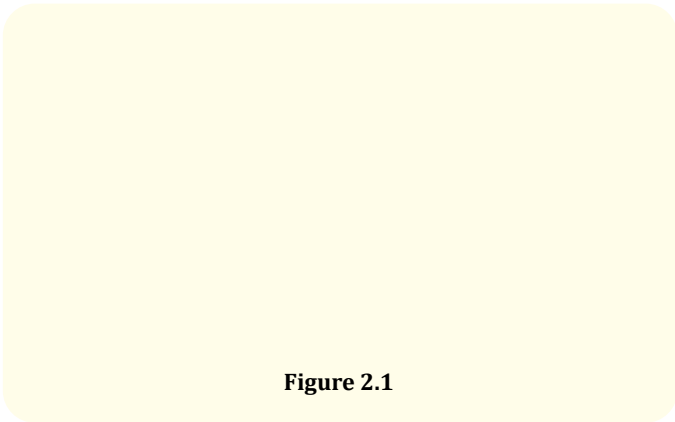


Figure 2.1

Blood chemistry analysis show double increase in BUN (Figure 2.2).

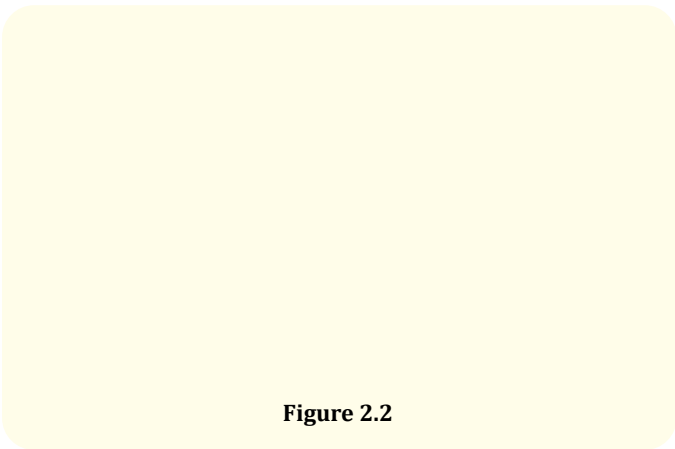


Figure 2.2

Hematuria

Hematuria may be a signs of kidney pelvis irritation, cystitis, urolithasis, hemorrhagic disease, neoplasia of the kidney (lypho-sarcoma) and neoplasia of the bladder (transitional cell carcinoma).it also occur as idiopathic condition specific to racing camel. this not only present of RBCS and WHITE BLOOD CELLS in urine but also make change in the haemogram. Rare case is recorded

with hematuria due to calcification of the distal tubules and some glomerulonephritis and this due to high level of minerals in the diet especially racing camel diet and there is also some evidence of that may linked to over administration of the non-steroidal anti- inflam-matory especially fluxicin meglamine in treatment of lameness.

1st case (calcification of distal tubules)

Two years old age male camel admitted to our hospital with case history hematuria from more than two weeks. When we checked the pervious history it suffers from mange and have alopecia and it take dormcetin and large amount of mineral supplement daily for more than twenty days. we make blood analysis we found the creatinine (17.42) also there was great anemia due to blood loss RBCS(4.73).after examination the kidney and UB seem to be nor-mal we give course of antibiotics and vitamin k to stop hemorrhage but with no benefit there was blood in urine after five days we made a blood analysis creatinine level reach(31.96) and the camel become more anemic so we suspect the cause of hematuria (calci-fication of distal tubules due to high dose of mineral supplement).

1st blood chemistry analysis shows High level of creatinine and urea (Figure 3.1).

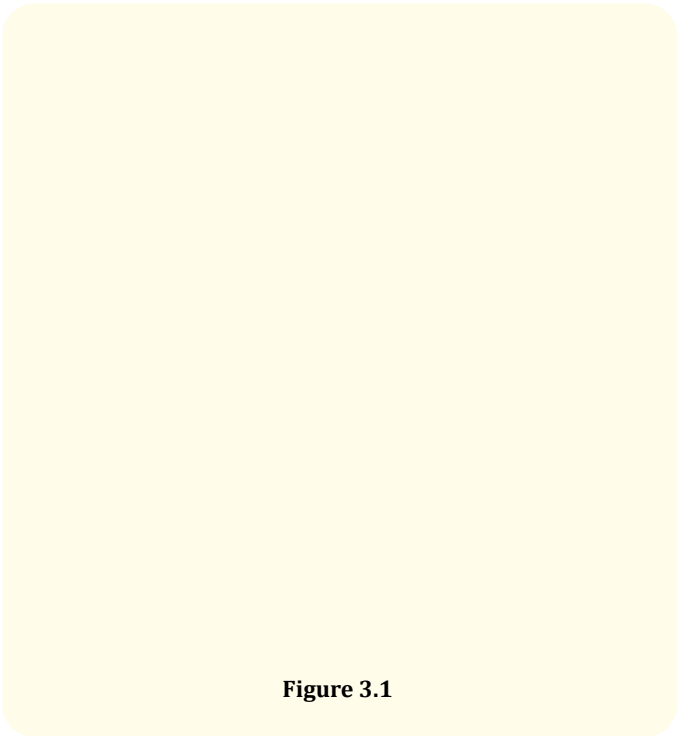
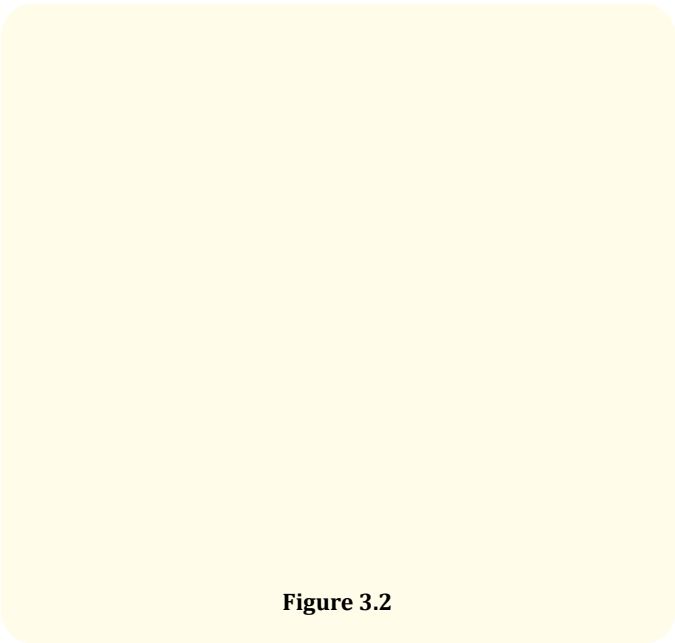
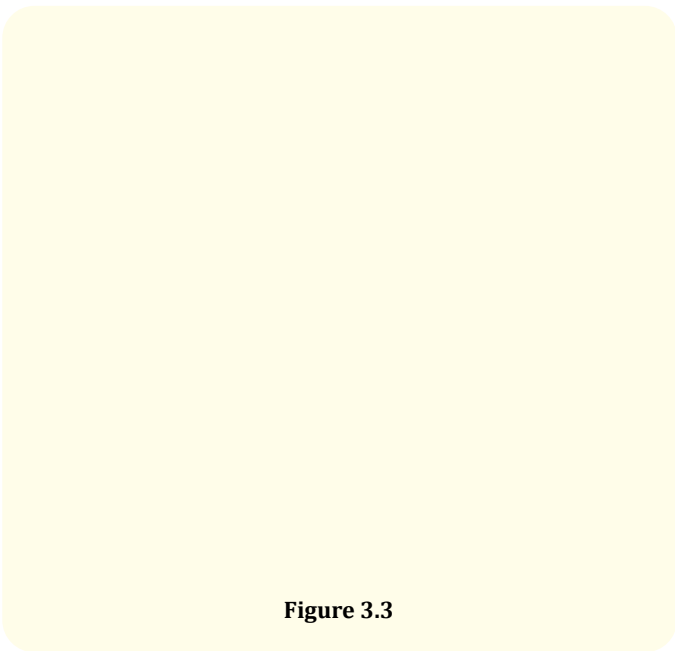


Figure 3.1

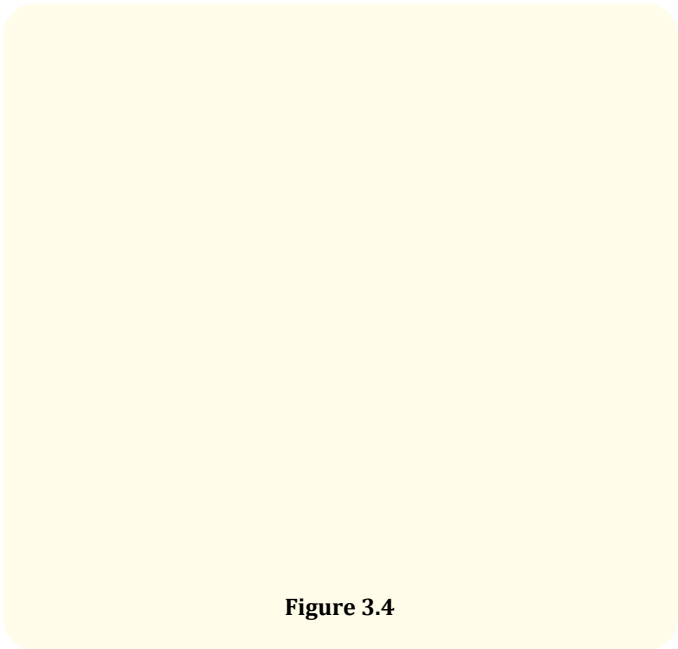
1st blood CBC show severe anemia (Figure 3.2).



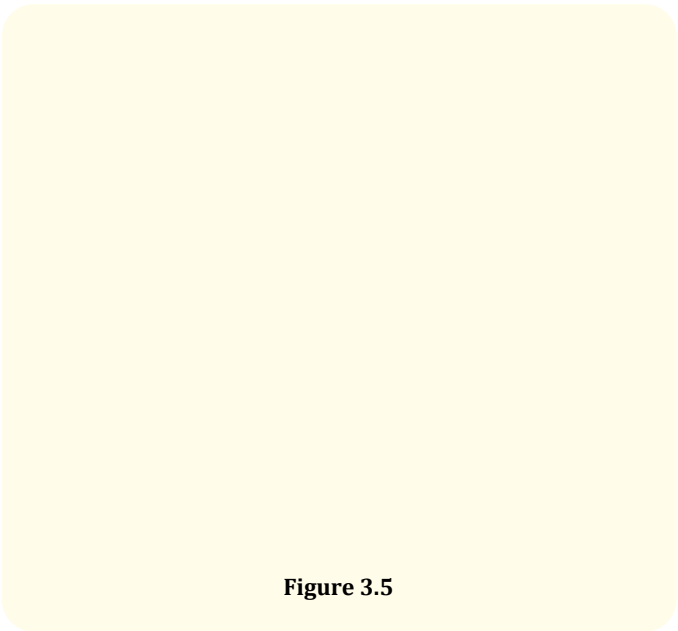
2nd blood chemistry analysis show continuous increase Level of creatinine (Figure 3.3).



Blood CBC show severe anemia (Figure 3.4).



Blood chemistry in second analysis also bun show severe increase (Figure 3.5).



2nd case (Cystitis)

Six years age old female camel admitted to our hospital was suffering from blood in urine by make urine and blood analysis

it shows hematuria and also few elevations in the kidney enzyme (creatinine: 4.47) normal from (1.30 to 2.20) after complete examination we detect it was cystitis after one week of antibiotic, dexamethasone, VITAMIN AD3E and vitamin k for 4 days the urine become clear and no blood in urine analysis and the creatinine level decrease by (.8) than first time

Urine analysis show high level of RBCS and pus cells in the urine (Figure 4.1).

Figure 4.1

Blood chemistry analysis show increase in the creatinine (Figure 4.2).

Figure 4.2

Gastrointestinal obstruction

IN THE CAMEL obstruction of the GIT tract are found in predisposed sites and due to particular diets and feeding environment. Camel sometimes ingest feces and garbage and sometime due to camels self-grooming habits lead to formation of hair balls (zootrichobezoars) so presence of foreign body in the rumen is usual thing which may be lead to abomasa/pyloric obstruction it act like a cork in pylorus and this lead to a ruminal overload (animal drink and feed not digested and don't reach intestine to be absorbed) and

lead also to dehydration because no water reach to intestine to be absorbed. The animal show signs of anorexia, scant feces and after few days there is distention in the lower right flank. If the camel drinks or is orally medicated the fluid likely to be vomited back. With above signs of hypokalemia. Also we detect that there is a relation between that and renal failure we have two explanation about that

- The First one due to severe long dehydration (due to no water reach the intestine to be absorbed) that occur due to obstruction make chronic renal insufficiency lead poor kidney function and renal failure in the end
- The second one is ruminal distention due to overload make a pressure in the aortic artery portion of the kidney lead to renal insufficiency and friction and renal failure.

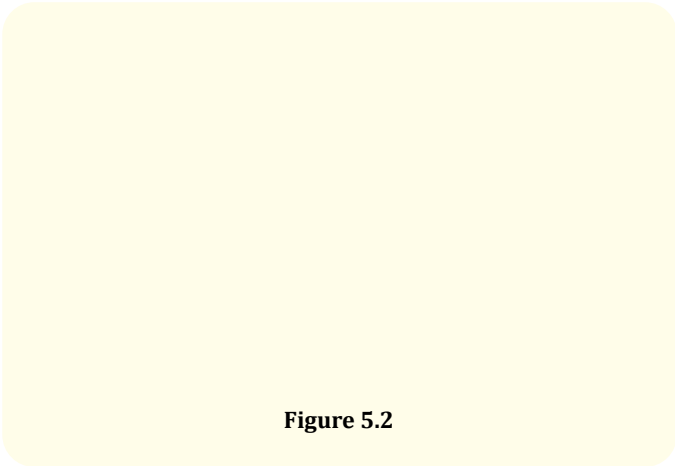
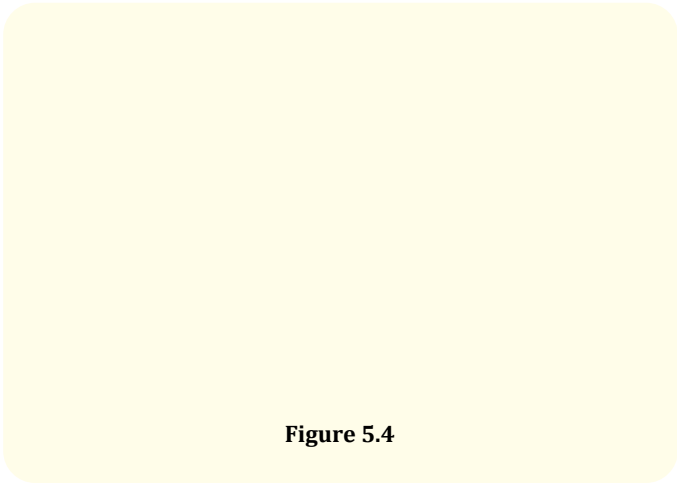
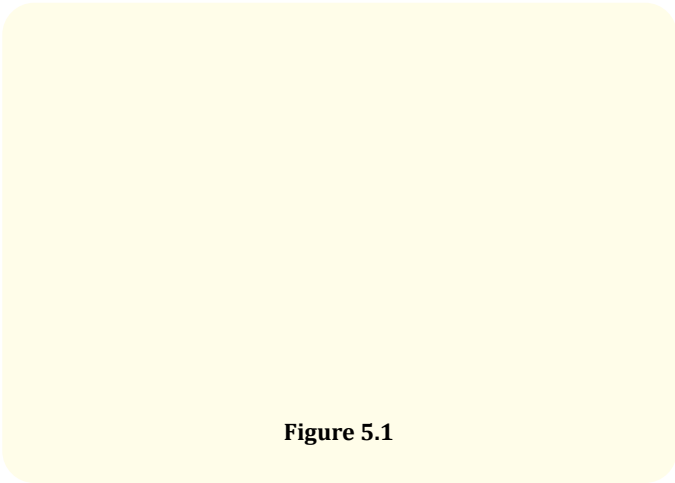
1st case (abomasa/pyloric obstruction)

seven years old age female camel had admitted to our clinic with owner complain of losing appetite, no defecation and sometime vomiting from more than one ten days. So by examination the camel show signs of dehydration, over distention in the abdomen from both side, scanty amount of feces in the rectum also by auscultation we found large amount of fluid in the rumen and complete stasis of the rumen and intestine movement. So by making a blood analysis the creatinine reach (20.74) and also GCT reach (39.1) normal range (25-33) and show slight hypokalemia (4.28) normal rang (5-6.5).

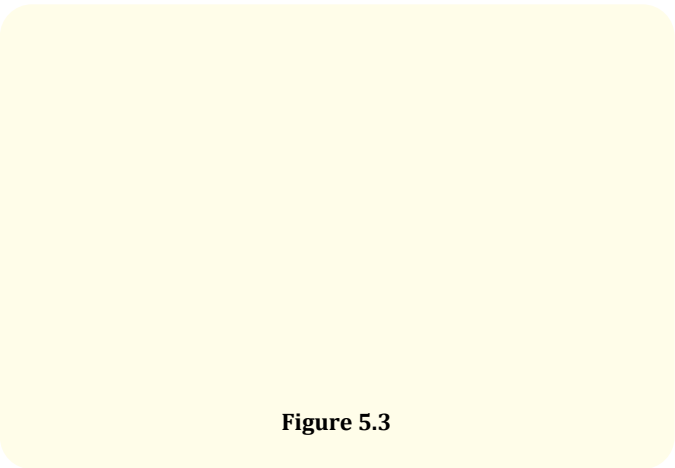
After treatment with fluid therapy and tonics and oral administration of paraffin oil and laxative it defecated well after two days and start to eat but too little and there were no signs of dehydration. we made another blood analysis after three days from the first one to see the level of creatinine. the creatinine level increase to (22.25) and also increase hypokalemia (2.97) although the HCT back to normal range (33.8) but seem that the damage of the kidney due to (renal insufficiency) was permeant the case die after 2 days.

1st blood chemistry analysis shows increase in creatinine (Figure 5.1).

1st blood CBC analysis show increase HCT due to dehydration (Figure 5.2).



2nd blood chemistry analysis shows severe increase in Creatinine and hypokalemia (Figure 5.3).

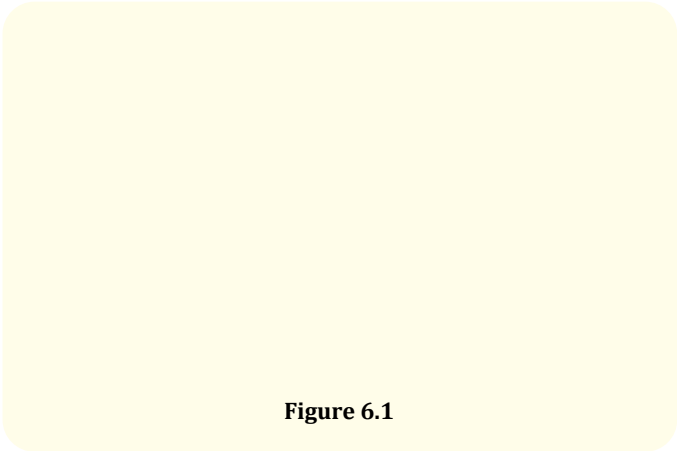


2nd blood CBC analysis show normal (Figure 5.4).

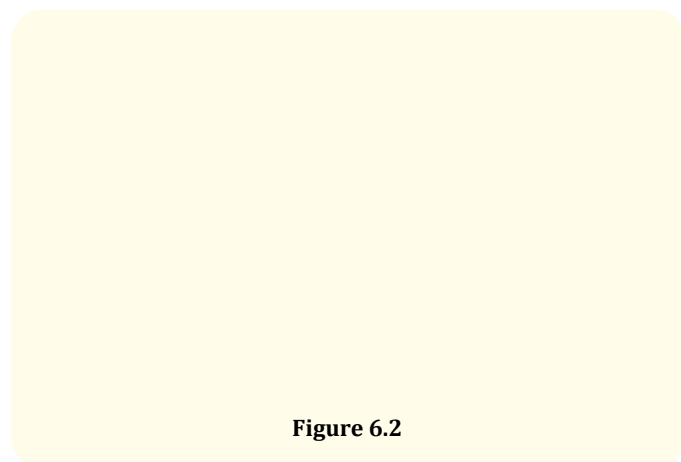
2nd case (abomasa/intestinal obstruction)

Two years old age female camel had admitted to our clinic with the owner complain that the camel loss the appetite, no defecation for more than twelve days and sometime it vomits from just three days and he gave it two litter of paraffin oil and inject it by liver tonic drug but no response. By examination there was signs of dehydration, over distention of the abdomen from both sides, dullness and difficult in respiration and by auscultation of the abdomen the rumen shows complete stasis and filled with large amount of fluid and ingest, the intestine also shows complete stasis and by rectal examination no feces in the rectum. By lab examination of blood (chemistry and CBC) we found severe increase in the creatinine (15.03) severe hypokalemia (2.72) and also show increase in liver enzyme ALT (50.7) normal range (4-25) and HCT (40.1) normal range (25-33).

Blood chemistry analysis show severe increase in creatinine and hypokalemia (Figure 6.1).



CBC analysis show severe increase in HCT due to dehydration (Figure 6.2).



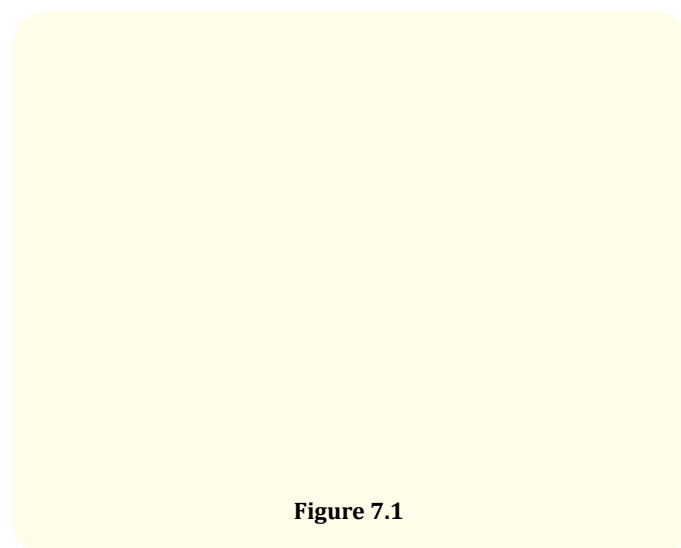
3rd case (dehydration)

This case may support the first theory of dehydration that follow (abomasa/ intestinal obstruction) that make renal insufficiency.

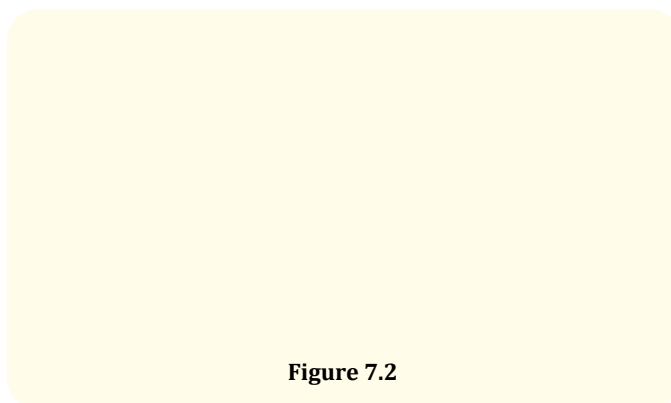
Twenty-day old age camel calf admitted to our clinic with severe diarrhea for one week.

By examination we found severe dehydration signs and by blood analysis show high increase of the HCT (45.4) and increase in creatinine (8.45) BUN (79) normal rang (8-20).

Blood chemistry analysis show increase level of BUN and creatinine due to renal insufficiency (Figure 7.1).



CBC analysis show increase in HCT due to dehydration (Figure 7.2).



Anti-inflammatory (NSAIDS)

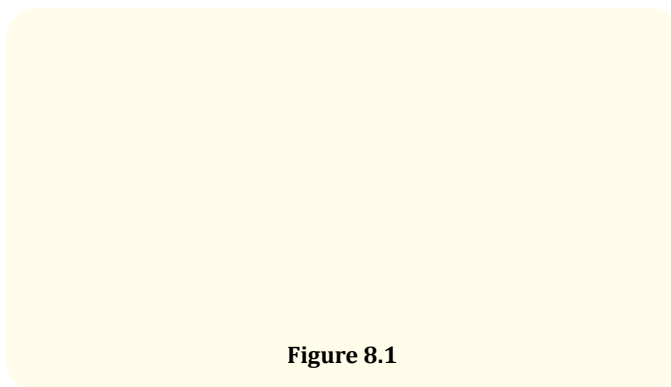
Non-steroidal anti-inflammatory drug have a great damage on the kidney of the camel and with minimal dose of it cause elevation in the kidney enzymes as we recorded and I will mention example for it. So uses of the NSAIDS with camel with caution

1st case

Four years old age male camel had admitted to our clinic with case history of respiratory manifestation more than one week and it injected by flunixin meglumine, diclofenac sodium and macro-lide (tylosin) for one week. After examination we suspected to be hemorrhagic septicemia due to pastereiosis.

By lab examination of blood we found severe increase creatinine (16.22).

The blood chemistry analysis show increase in creatinine level (Figure 8.1)



2nd case

Ten years old age male camel admitted to our hospital with previous surgical interference (mandible fraction) to make a blood analysis to it so the lab analysis shows high increase in creatinine (9.77) and HCT (49.8) (severe dehydration suspected due to inability to drink water) so it entered in severe dehydration.

So we checked the case history with the owner and the drugs that he had given to it. The camel was injected by maximum dose flunixin meglumine for three days then complete by meloxicam long acting (use one shot only or repeated after five days) for four days. So with these factors of excessive use of NSAIDS and severe dehydration cause renal failure and sudden death of the camel.

Blood chemistry analysis show high increase in the creatinine (Figure 9.1).

Figure 9.1

Blood CBC show severe increase in HCT due to dehydration (Figure 9.2).

Figure 9.2**Ascending infection (lower urinary tract infection)**

The ascending bacteria from lower urinary develops many problems like urethritis, cystitis and pyelonephritis. Any of this may develop many other related problems start from urine retention till renal failure. most common bacteria responsible for that are *C. renale*, *E. coli*, *Staphylococcus lugdunensis* and *streptococci*. Many cases develop cystitis and continue to reach the kidney to make pyelonephritis.

1st case

Eight years old age female camel had admitted to our clinic with case history of fever, sometime loss of appetite, pregnant from four to five months and show signs and direct its neck toward right flank. we examined it the camel show sign of colic by rectal examination we found hard mass (like stone) in the left horn of uterus (suspected to be mummified fetus) by complete rectal examination of the kidney it consistency is doughy and also the urinary bladder shows thickening wall. By ultrasound examination we confirm the mummified fetus, pus conformation in both kidney (pyelonephritis) and chronic inflammation of the urinary bladder. Also the lab analysis normal level of creatinine and BUN but show also severe neutrophilia.

Blood chemistry analysis show normal BUN and Creatinine analysis (Figure 10.1).

Figure 10.1

Blood CBC analysis show severe neutrophilia (Figure 10.2).

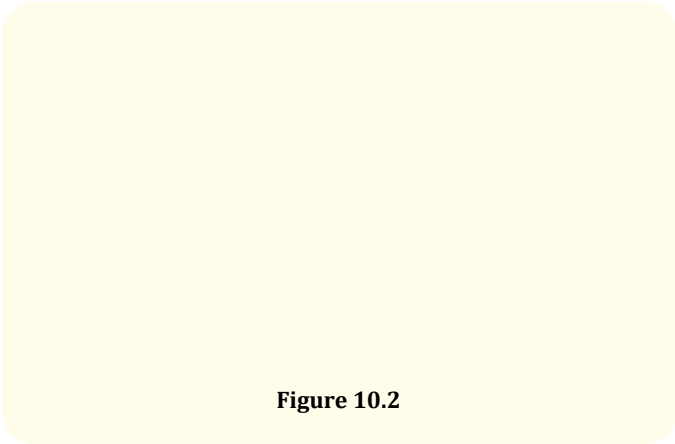


Figure 10.2

Ultrasound examination show chronic cystitis (Figure 10.3).

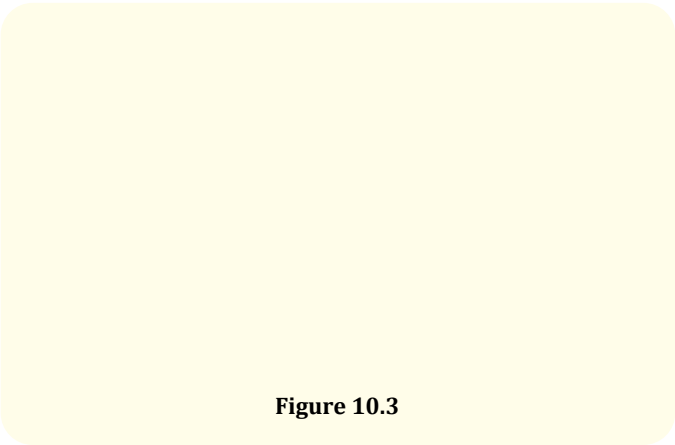


Figure 10.3

Ultrasound examination show mummified fetus (Figure 10.4 and 10.5).

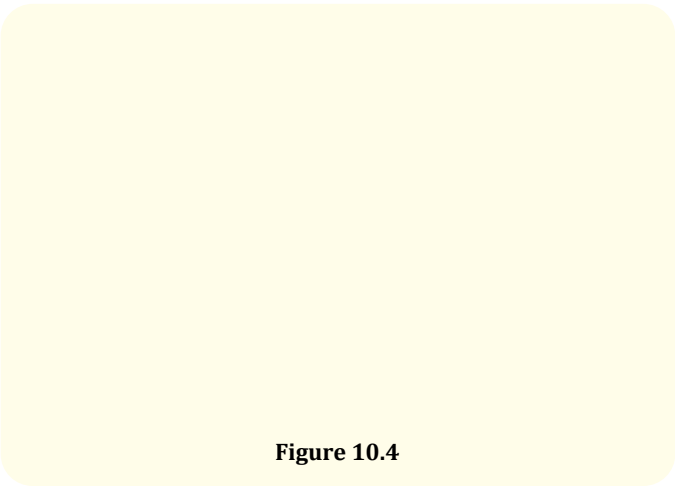


Figure 10.4

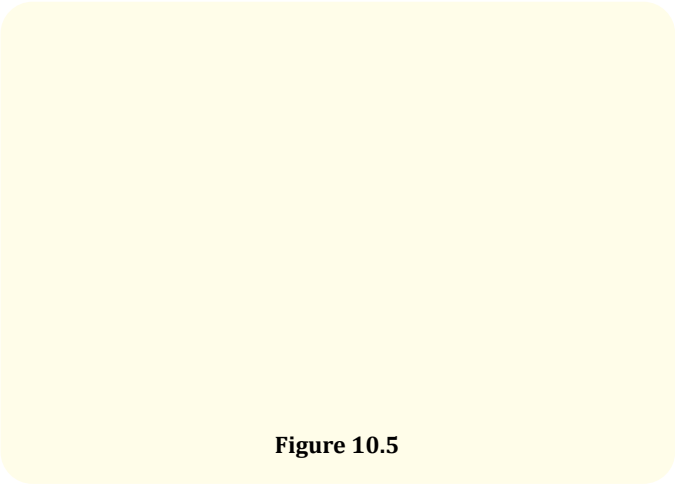


Figure 10.5

The left kidney show large mass of puss (rectal examination) (Figure 10.6 and 10.7).

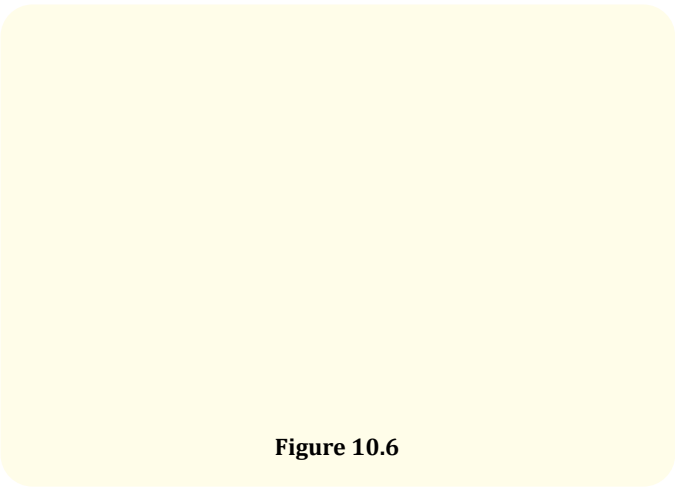


Figure 10.6

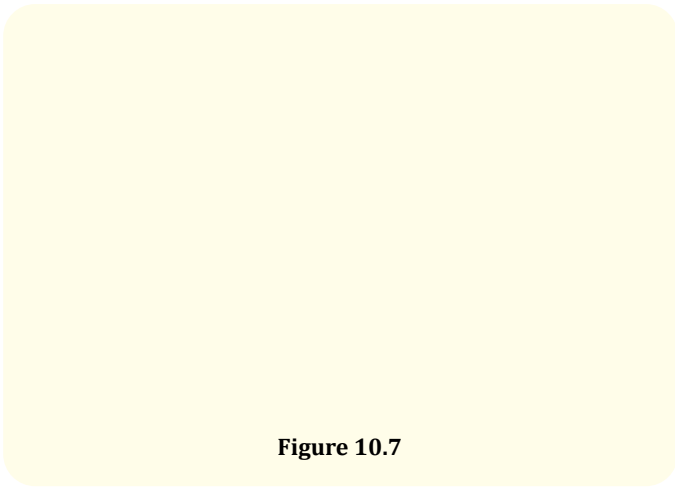
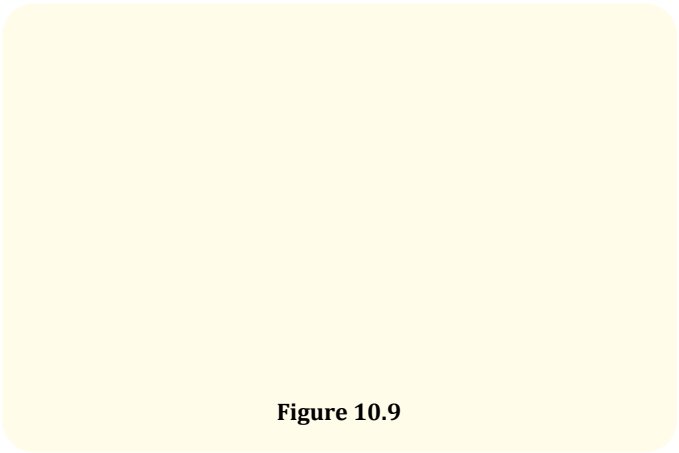
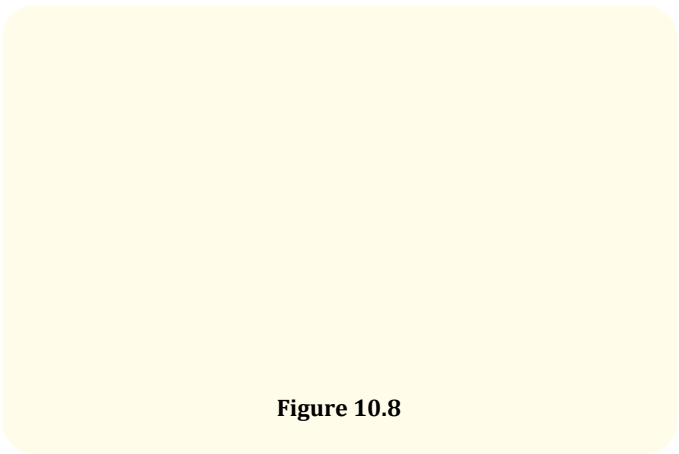
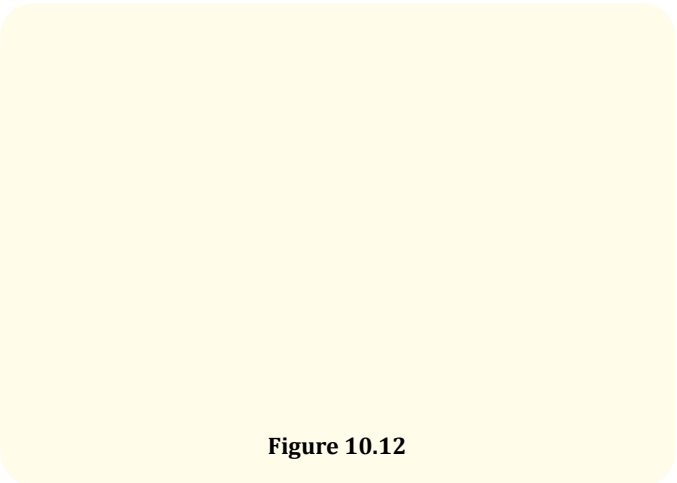
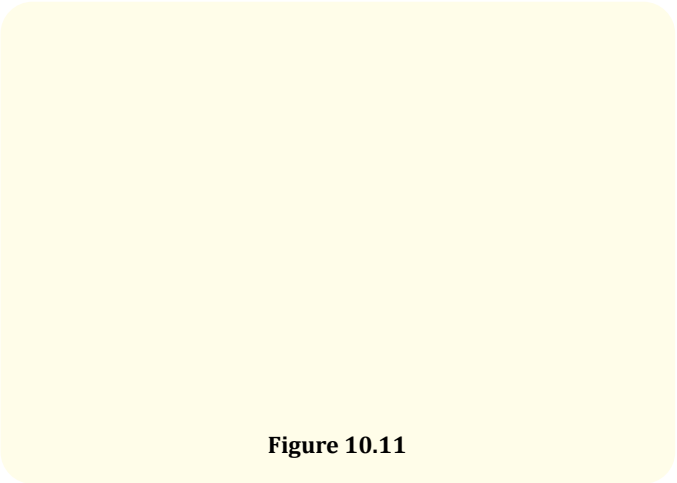
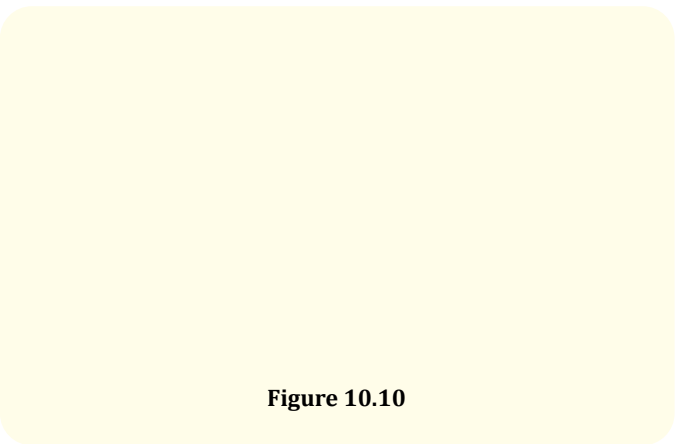


Figure 10.7

Left kidney show puss formation (transabdominal examination) (Figure 10.8 and 10.9)



Right kidney shows pus formation (pus mass) (transabdominal examination) (Figure 10.10-10.12).



N.B: Some cases were recorded with pyelonephritis and the lab analysis (blood chemistry) show normal creatinine and bun level. we will mention that in another paper.

Conclusion

The disease of the kidney in camels consider a silent killer as many cases show no signs and suddenly died and after postmortem we found many kidney disorders. Some cases show slit signs of colic, loss of appetite and sometimes change in posture of the urination. So it need good observation from the owner and this make the detection of the problem so difficult and this cases after symptomatic treatment show improvement but unfortunately after few times it back to the pervious situation. So veterinarians should put in them mind the kidney disease because it is so repeated cases. Veterinarians should make a rectal examination during

general examination to check up the both kidney and urinary bladder. and also depend on lab and ultrasound diagnosis to examine the kidney.

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