COLLEGE OF OSTEOPATHIC MEDICINE OF THE PACIFIC

RENAL - FIRST EXAM

JANUARY 23, 1995

#1

Choose the ONE best answer.

Slides

1. This renal lesion is

   a. autoimmune.
   b. inflammatory.
   c. benign.
   d. malignant.
   e. ischemic.

2. This renal lesion signifies a

   a. metastasizing neoplasm.
   b. severe underlying glomerular disease.
   c. chronic pyelonephritis.
   d. renal infarct.
   e. traumatic laceration.

Dr. Gilbert

3. Adult polycystic renal disease (PKD 1) is

   a. autosomal dominant.
   b. autosomal recessive.
   c. not a genetic disease.
   d. only seen in males.
   e. only seen in females.

4. Renal cell adenocarcinoma has which usual gross appearance?

   a. small
   b. thick capsule
   c. red due to fibrosis
   d. yellow due to necrosis
   e. firm

1/D 2/B 3/A 4/D

5. Stage III renal cell CA is characterized by

a. distant metastases.
b. metastases to vertebral column.
c. involvement of regional lymph nodes and/or renal vein and vena cava.
d. invasion of perinephric fat.
e. confined to Gerota's fascia.

6. The most common age for the occurrence of Wilm's tumor is

a. newborn to 1st year.
b. 1-3.
c. 4-6.
d. 7-9.
e. 10-12.

7. In benign nephrosclerosis (BNS)

a. there is severe proteinuria.
b. systolic pressure usually greater than 200 mm/Hg.
c. diastolic pressure usually greater than 120 mm/Hg.
d. microscopic picture characterized by hyaline arteriolosclerosis.
e. kidneys show petchial hemorrhages (flea-bitten) on cortical surface.

8. In malignant nephrosclerosis (MNS)

a. renin is minimally elevated.
b. gross surface is finely granular.
c. diastolic pressure less than 120 mm/Hg.
d. minimal mortality.
e. fibrinoid necrosis of arterioles.

9. The Hemolytic Uremic Syndrome

a. is a disease of adults.
b. starts with acute renal failure.
c. starts with anemia.
d. starts with bleeding disorders.
e. starts with diarrhea, vomiting and sometimes a respiratory infection.

10. In scleroderma (progressive systemic sclerosis)

a. the hands are not involved.
b. the glomeruli are primarily involved.
c. the GI tract is spared.
d. shows Raynaud's phenomenon.
e. patients are not hypertensive.

5/C 6/B 7/D 8/E 9/E 10/D

11. In acute pyelonephritis

a. the cortical surface is deeply scarred.
b. the calyceal deformities are present.
c. there is papillary blunting.
d. there is marked vascular change.
e. the kidneys may be grossly normal or enlarged.

12. Which of the following conditions is considered a primary chronic interstitial renal disease?

a. acute post-strep GN
b. analgesic abuse nephropathy
c. scleroderma
d. S.L.E.
e. hemolytic uremic syndrome

13. Which of the following is a characteristic of acute tubular necrosis (ATN)?

a. destruction of the tubular basement membrane
b. no interstitial inflammation
c. severe vascular disease
d. glomerular reaction
e. Michaelis-Gutmann bodies

14. The most common bacterial agent for an ascending infection in acute pyelonephritis is

a. Proteus.
b. T.B.
c. E. coli.
d. Enterobacter.
e. Staph.

15. The nephrotic syndrome is characterized by all of the following EXCEPT

a. generalized edema.
b. hyperlipemia.
c. hypoproteinemia.
d. hematuria.
e. proteinuria.

16. All of the following clinical situations are associated with S.L.E. EXCEPT

a. psoriasis.
b. alopecia.
c. CNS problems.
d. arthritis.
e. Raynaud's phenomenon.

11/E 12/B 13/A 14/C 15/D 16/A

17. Amyloidosis may be secondary to all of the following diseases EXCEPT

a. osteomyelitis.
b. ulcerative colitis.
c. post-strep GN.
d. rheumatoid arthritis.
e. multiple myeloma.

18. Characteristics of acute post-strep GN include

a. IgM deposits in mesangium.
b. IgA deposits in GBM.
c. IgG deposits between epithelial cells and GBM
d. IgA deposits in mesangium.
e. no electron dense deposits.

Dr. Martinelli

19. Treatment for superficial bladder cancer is

a. radiation therapy.
b. transurethral resection of bladder tumor.
c. bilateral pelvic lymphadenectomy and radical cystectomy, with continent diversion.
d. systematic chemotherapy.
e. observation only.

20. Radical cystectomy in a male includes

a. removal of bladder alone.
b. removal of bladder and prostate.
c. removal of bladder, prostate and seminal vesicles.
d. removal of bladder, prostate, seminal vesicles and the entire urethra.

21. The most common type of cancer in the renal pelvis is

a. squamous cell carcinoma.
b. transitional cell carcinoma.
c. sarcoma.
d. adenocarcinoma.
e. lymphoma.

22. The classic triad for renal cell carcinoma is

a. fever, flank pain, hematuria.
b. abdominal mass, fever, flank pain.
c. anemia, hematuria, weight loss.
d. hematuria, abdominal mass, flank pain.
e. hematuria, weight loss, fever.

17/c 18/c 19/B 20/c 21/B 22/D

Dr. May

23. Urine leaves the nephron by passing into the

a. minor calyx.
b. renal pelvis.
c. collecting duct.
d. major calyx.
e. loop of Henle.

24. Which of the following parts of the uniniferous tubule are histologically similar?

a. Proximal convoluted tubules and thin loops of Henle.
b. Proximal convoluted tubules and distal convoluted tubules.
c. Proximal convoluted tubules and thick loops of Henle.
d. Distal convoluted tubules and thick loops of Henle.
e. Distal convoluted tubules and collecting ducts.

25. Interlobular arteries are branches of

a. arcuate arteries.
b. interlobar arteries.
c. efferent arterioles.
d. afferent arterioles.
e. none of the above.

26. Juxtaglomerular cells are

a. located in the collecting ducts and secrete renin.
b. also known as mesangial cells.
c. are a component of the macula densa.
d. are present in the wall of afferent arterioles and secrete angiotensinogen.
e. none of the above.

27. Transitional epithelium is found lining all of the following EXCEPT

a. renal pelvis.
b. minor calyx.
c. membranous urethra.
d. ureter.
e. urinary bladder.

28. The urinary space is lined by

a. parietal epithelium.
b. mesangial cells.
c. podocytes.
d. all of the above.
e. a and c only.

23/C 24/D 25/A 26/E 27/C 28/E

29. The transcellular fluid compartment

a. includes the fluid inside red blood cells.
b. has a volume greater than plasma volume.
c. includes fluid in dense connective tissue, cartilage and bone.
d. includes cerebrospinal and intraocular fluids.
e. can be measured directly with the indicator dilution method by using inulin as the indicator.

30. Consider the following values:

Glomerular capillary filtration coefficient = 14 ml/min/mmHg
Proximal tubular fluid oncotic pressure = 0 mmHg
Glomerular capillary mean hydrostatic pressure = 44 mmHg
Proximal tubular fluid hydrostatic pressure = 11 mmHg
Glomerular capillary mean oncotic pressure = 24 mmHg

Based on these values:

14 (44 − 11 − 24)
14(9)
126

a. net filtration pressure is 6 mmHg.
b. glomerular filtration rate is 126 ml/min.
c. net filtration pressure is 11 mmHg.
d. glomerular filtration rate is 122 ml/min.
e. net filtration pressure is 13 mmHg.

31. Which of the following statements is TRUE?

a. In humans, net filtration pressure in glomerular capillaries normally decreases to zero before the blood flows into the efferent arterioles.
b. Net filtration pressure in glomerular capillaries normally increases progressively as blood flows from afferent arterioles to efferent arterioles.
c. An increase in glomerular capillary blood flow rate diminishes the extent to which plasma oncotic pressure rises as blood flows from afferent arterioles to efferent arterioles.
d. The plasma oncotic pressure in glomerular capillaries normally remains constant as blood flows from afferent arterioles to efferent arterioles.
e. A decrease in glomerular capillary blood flow rate results in an increase in glomerular filtration rate.

32. Renal proximal tubular cells reabsorb solute "Y" by a carrier-mediated, transport maximum (Tm) system. This type of transport system is correctly characterized by which of the following?

a. The transport system has a relatively high K_m value.
b. There is no plasma threshold concentration for solute "Y" evident.
c. The carrier protein has a low affinity for solute "Y".
d. There is a relatively high rate of back-diffusion of solute "Y" from the peritubular space into the lumen of the proximal tubule.
e. The transport system can generate relatively large concentration gradients of solute "Y" across the proximal tubular walls.

33. Substances "Z" is freely filtrated by the glomerulus, and is excreted in the urine of a patient. The lab provides the following information:

Glomerular filtration rate = 130 ml/min
Urine flow rate = 3 ml/min
Urine concentration of "Z" = 90 mg/ml
Plasma concentration of "Z" = 3 mg/ml

$\frac{90 \times 3}{3} = 270/3 =$

$GFR_Z = 130 \times 3 =$
excreted = 270 mg/min

These values indicate that

a. "Z" is secreted in net amounts by the renal tubules at a rate of 270 mg/min.
b. "Z" is excreted in the urine at a rate of 390 mg/min.
c. "Z" is reabsorbed in net amounts by the renal tubules at a rate of 120 mg/min.
d. "Z" is neither reabsorbed nor secreted in net amounts by the renal tubules.
e. "Z" is filtered by the glomerulus at a rate of 130 mg/min.

33/C 34/D 35/A 36/A

34. In the proximal tubule

a. Na^+ ions are transported across the luminal membranes of the epithelial cells by a primary active transport system.
b. Cl^- ions are reabsorbed from the lumen mostly by cotransport with Na^+ ions across the luminal membranes.
c. about 35% of both Na^+ ions and water filtered by the glomerulus are reabsorbed.
d. K^+ ions are reabsorbed from the lumen to peritubular space largely by simple diffusion through the tight junctions between adjacent epithelial cells.
e. Na^+ ions are transported across the basolateral membranes of the epithelial cells by simple diffusion.

35. In the distal convoluted tubule

a. the epithelial cells and their tight junctions are essentially impermeable to water in humans.
b. Na^+ ions are reabsorbed by a transport system which does not require the Na-K pump.
c. Cl^- ions are reabsorbed from the lumen by a primary active transport system in the luminal membranes of the epithelial cells.
d. there is a high rate of back-diffusion of reabsorbed Na^+
e. about 25% of the K^+ ions filtered by the glomerulus are reabsorbed.

36. In the thick ascending limb of the loop of Henle

a. Cl^- ions are reabsorbed from the lumen by a cotransport system in the luminal membranes which transports two Cl^- ions with one Na^+ ion and one K^+ ion.
b. there is no transport of K^+ ions from the tubular lumen into the peritubular space.
c. Na^+ ions enter the tubular lumen from epithelial cells by primary active transport.
d. substantial amounts of water are reabsorbed, due to high medullary interstitial osmolality.
e. Na^+ ions are transported across the luminal membranes of the epithelial cells by the Na-K pump.

37. The renal tubular secretion of a weak base

a. occurs because the luminal membranes of the epithelial cells are impermeable to the uncharged weak base.
b. is diminished when H^+ ion secretion by the tubular cells increases.
c. occurs because the luminal membranes of the epithelial cells are permeable to the cation formed by H^+ and the weak base.
d. occurs when the tubular fluid concentration of the uncharged weak base is greater than that in peritubular capillary plasma.
e. is enhanced when the tubular fluid is made more acidic.

38. The following values were obtained for inulin and for solute "X", which is freely filtered by the glomerulus:

Urine concentration of inulin = 80 mg/ml
Plasma concentration of inulin = 2 mg/ml
Urine concentration of "X" = 80 mg/ml
Plasma concentration of "X" = 1.2 mg/ml
Urine flow rate = 3.2 ml/min.

$C_X \quad \frac{80 \times 3.2}{1.2} = 160$

$C_{in} \quad \frac{80 \times 3.2}{2} = 128$

These values indicate that

a. the renal clearance of "X" = 160 mg/min.
b. "X" is excreted in net amounts by the renal tubules.
c. the renal clearance of "X" is 192 mg/min.
d. the renal clearance of inulin = 256 mg/min.
e. glomerular filtration rate is 128 mg/min.

39. If an individual's plasma creatinine concentration has increased to about three times its normal value, it is likely that

a. the individual's glomerular filtration rate has increased to about three times its normal value.
b. the individual's inulin clearance would be decreased to about one-sixth its normal value.
c. the individual's effective renal plasma flow has increased to about three times its normal value.
d. the individual's glomerular filtration rate has decreased to about one-third its normal value.
e. the individual's renal fraction has increased to about six times its normal value.

37/E 38/B 39/D 40/C

40. Which of the following statements regarding the renal circulation and renal function is CORRECT?

a. Efferent arteriolar constriction cause GFR to decrease if afferent arteriolar radius is constant.
b. Dilation of either afferent of efferent arterioles will decrease peritubular capillary hydrostatic pressure.
c. Constriction of afferent and/or efferent arterioles tends to increase the rate of net reabsorption of fluid into peritubular capillaries.
d. An increase in GFR decreases peritubular capillary plasma oncotic pressure.
e. Afferent arteriolar dilation causes GFR to decrease if efferent arteriolar radius is constant.

Dr. Kuehn

41. The collecting ducts of the adult kidney

DA (Thinkpt from May)

a. derive from metanephrogenic blastema.
b. are all separate buds from the mesonephric ducts.
c. will link up with ducts from more than one nephron during development.
d. are referred to as the pronephros.
e. are the only adult derivative from the ureteric bud.

42. If a patent canal is found at birth which connects the urinary bladder to the umbilicus, this is

a. called a Urachal Fistula.
b. called a Urachal Sinus.
c. derived from the allantois.
d. the medial Umbilical Ligament.
e. both a and c are correct.

Dr. Felton

43. In patients having a lower urinary tract infection, which of the following is most likely to predispose them to an ascending infection of the upper urinary tract?

a. defective vesicoureteral valve
b. colonized anterior urethra
c. suprapubic aspiration
d. sexual intercourse

44. Which of the following is NOT one of the specimens obtained in the segmented specimen method?

DA

a. urethral specimen
b. bladder urine specimen
c. expressed prostatic secretion
d. upper tract specimen

40/C 41/C 42/E 43/A 44/D

45. Which of the following organisms is most likely to cause urethritis without causing cystitis?

a. Chlamydia trachomatis
b. Escherichia coli
c. Proteus vulgaris
d. Enterococcus fecalis

46. Which of the following organisms is most likely to be present as normal urethral flora?

a. Enterobacter cloacae
b. Staphylococcus epidermidis
c. Staphylococcus aureus
d. Streptococcus mitis

47. Which of the following organisms is least likely to be involved in urinary tract infections of hematogenous origin?

a. Staphylococcus aureus
b. Candida albicans
c. Klebsiella pneumoniae
d. Enterococcus (formerly Streptococcus) fecalis

48. Which of the following is the best time to collect a urine specimen for diagnosis of a urinary tract infection?

a. mid day
b. after meals
c. just before going to sleep
d. just after arising in the morning

49. You have a properly collected urine specimen which has been found to contain bacteria at a concentration of 10^4/ml. There are a number of factors which would tend to increase the likelihood that this concentration represents significant bacteriuria in the specimen. Which of the following is NOT one of those factors?

a. male patient
b. dysuria present
c. specimen obtained by suprapubic aspiration
d. organism is a lactose fermenter

50. Prostatic massage is usually contraindicated in which of the following?

a. acute bacterial prostatitis
b. chronic bacterial prostatitis
c. non-bacterial prostatitis
d. prostatosis

45/A 46/B 47/C 48/D 49/D 50/A

51. Hyperacute rejection of a transplanted kidney is usually mediated by

a. cytotoxic T lymphocytes
b. pre-formed anti-blood group antibody
c. macrophages
d. antibody produced following transplantation

52. Which of the following characteristics of Streptococcus pyogenes (Group A) is most strongly associated with the ability of a strain to produce post-streptococcal glomerulonephritis?

a. type of hemolysis
b. pili which promote bacterial adherence to renal tissue
c. M-serotype
d. length of chains of cocci

Dr. Luben

53. A genetic insufficiency in the activity of which enzyme in the urea cycle would lead to accumulation of citrulline in the tissues and urine?

a. carbamoyl phosphate synthetase
b. ornithine transcarbamoylase
c. argininosuccinate synthetase
d. argininosuccinate lyase
e. arginase

54. The primary function of the urea cycle in humans is to

a. produce arginine from aspartate.
b. dispose of excess ammonia nitrogen.
c. serve as a sink for mitochondrial NADH.
d. synthesize fumarate for the citric acid cycle.
e. none of the above.

55. The clinical case study of hyperammonemia presented in class was a female infant with a deficiency of ornithine transcarbamoylase. This case could be considered an unusual example of this syndrome because

a. the child did not survive the disease.
b. a low protein diet made the symptoms less severe.
c. the symptoms did not become noticeable until weaning.
d. the child was female and this is an X-linked disease.
e. none of the above.

56. About what percentage of renal stones are composed primarily of calcium salts?

a. 99%
b. 75%
c. 33%
d. 10%
e. 1%

51/B 52/C 53/C 54/B 55/D 56/B

Dr Wong

57. All of the following statements about methenamine hippurate (Hiprex) are correct EXCEPT

a. It is bactericidal by releasing formaldehyde in the acidic urine.
b. It is effective as prophylactic treatment of recurrent urinary tract infections.
c. It may cause allergic dermatitis, drug fever, headache, drowsiness and peripheral neuritis.
d. It is not considered a drug of first choice for acute urinary tract infections.
e. It is effective only in acidic urine and may form insoluble precipitate with sulfonamides.

58. Ofloxacin (Floxin)

a. inhibits bacterial DNA replication by inhibiting DNA gyrase
b. may cause severe ototoxicity.
c. is the drug of choice for the treatment of chronic urinary tract infections.
d. produces arthropathy, tendonitis and joint swelling in some patients.
e. a and d of the above.

Dr. Said

59. Lithotomy is

a. incision of an organ for the removal of a stone.
b. inflammation of the testes.
c. a stone lodged in the ureter.
d. plastic surgery of the urethra.

60. Urethroplasty is

a. plastic surgery of the ureter.
b. plastic surgery of the urethra.
c. plastic surgery of the penis.
d. plastic surgery of male genitalia.

61. Normal lab value for serum uric acid is

a. 2-5 mg. %
b. 5-10 mg %
c. 10 -20 mg %
d. 5-10 gm %

62. Normal creatinine clearance is measured in

a. ml/min.
b. ml/hr.
c. liters/min.
d. liters/hr.

57/C 58/E 59/A 60/B 61/A 62/A