Resident Teaching Conference
Organ Transplantation

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DW

- 56 year old male
- Chronic Hepatitis C cirrhosis
- Referred to Surgery clinic for transplant evaluation

HPI

- Contracted Hepatitis C during blood transfusion
- Complications of liver disease:
  - Upper GI bleeding secondary to esophageal varices (banded)
  - Ascites
  - Spontaneous bacterial peritonitis
  - Encephalopathy

- PMH
  - Bicuspid aortic valve
  - CHF
  - DM II
- PSH
  - Back surgery 1969
  - EGD with banding of varices
- FH
  - mother :diabetes, CVA, CHF
  - Brother :diabetes
- Meds
  - Humulin N
  - Humulin R
  - Levofloxacin
  - Spironolactone
  - Lansoprazole
  - Propranolol
  - Furosemide
  - Lactulose
  - Sertraline
- SH
  - Non-smoker
  - No etoh
  - married

Physical Exam

- Vitals: temp 99.1, BP 104/64, HR 68, weight 210 lbs.
- Exam:
  - AAO, scattered spider angiomata, palmar erythema present, sclera icteric
  - No JVD
  - CTA bilaterally
  - RRR with aortic ejection murmur
  - Abdomen with minimal ascites, left lobe of liver and spleen are palpable
  - Trace peripheral edema
  - No asterixis

Labs

137	103	12
4.4	27	0.8

Glucose 252

6.3	62
44	

Total protein 7.5
Albumin 3.2
Total bilirubin 1.7
Alk phos 66
ALT 43
AST 27

INR 1.2

Workup

- Liver biopsy: cirrhosis and chronic hepatitis
- EGD: portal gastropathy and esophageal varices s/p banding
- Abdominal ultrasound: cirrhosis, ascites, portal hypertension, portal vein patent, splenomegaly

Transplant workup

- Labs
  - ABO
  - Serologies (hepatitis, HIV)
  - AFP, CA 19-9
  - Hypercoagulable workup
  - Alpha-antitrypsin, ceruloplasmin
- Echo: bicuspid AV with insufficiency, dilated LA/RA, EF >55%
- Abd CT: cirrhosis, splenomegaly, minimal ascites, no HCC
- Colonoscopy: no masses or mucosal abnormalities
- PFTs: normal

Child Pugh Score (A BEAN)

- Albumin
  - Albumin >3.5 g/dl: 1 point
  - Albumin 2.8 to 3.5 g/dl: 2 point
  - Albumin <2.8 g/dl: 3 point
- Bilirubin
  - Bilirubin <2 mg/dl: 1 point
  - Bilirubin 2-3 mg/dl: 2 points
  - Bilirubin >3 mg/dl: 3 points
- Encephalopathy
  - No Encephalopathy: 1 point
  - Encephalopathy controlled medically: 2 point
  - Encephalopathy poorly controlled: 3 point
- Ascites
  - No Ascites: 1 point
  - Ascites controlled medically: 2 point
  - Ascites poorly controlled: 3 point
- INR
  - INR <1.70: 1 point
  - INR 1.71 to 2.20: 2 point
  - INR >2.20: 3 point

Child's Class A (5-6 points)
- life expectancy: 15-20 yrs
- peri-operative mortality: 10%

Child's Class B (7-9 points)
- indicated for liver transplant evaluation
- peri-operative mortality: 30%

Child's Class C (10-15 points)
- life expectancy: 1-3 yrs
- peri-operative mortality: 82%

MELD

- INR
- Bilirubin
- Creatinine

- Surgical consult from Emergency Department for incarcerated umbilical hernia

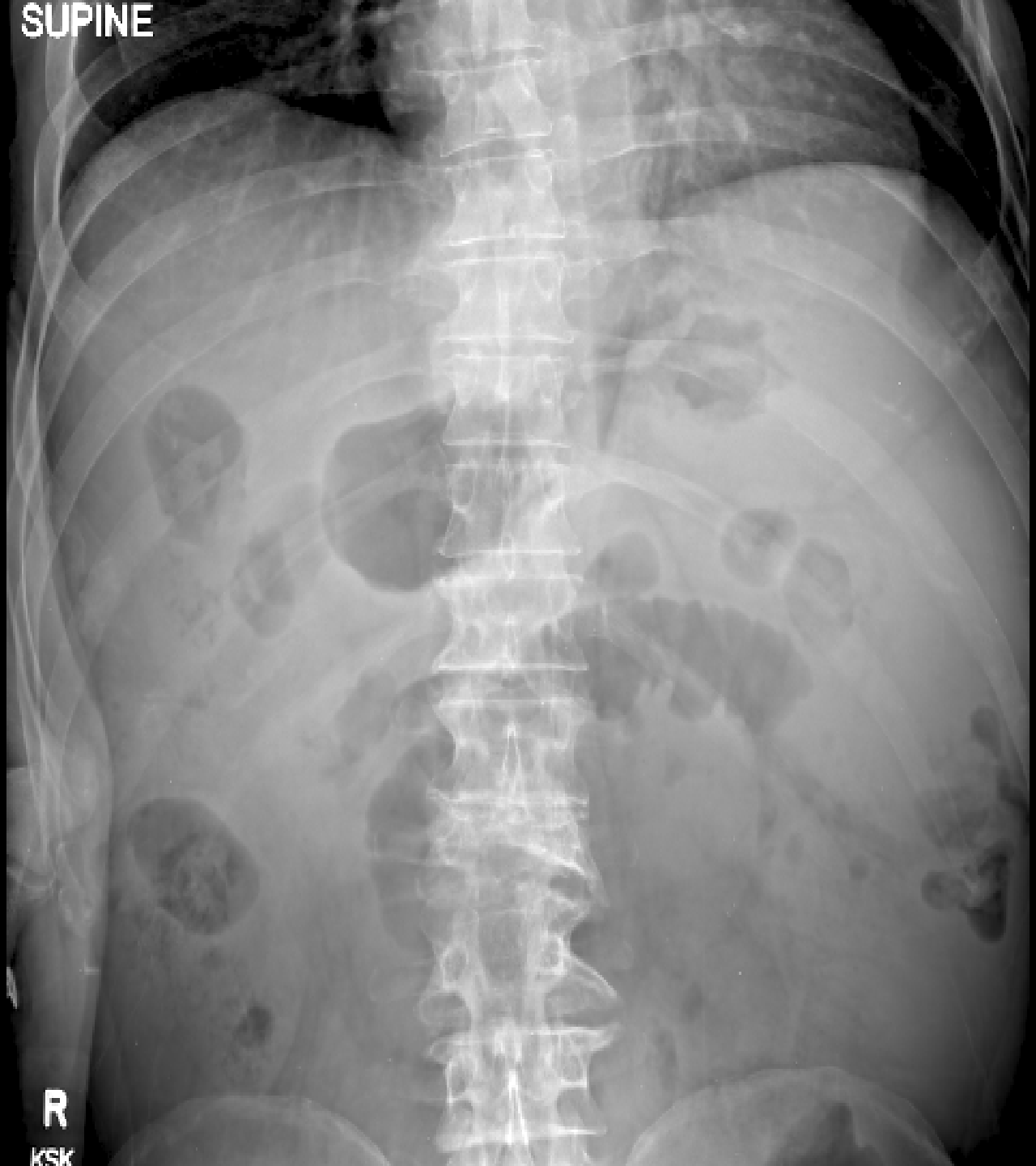
HPI

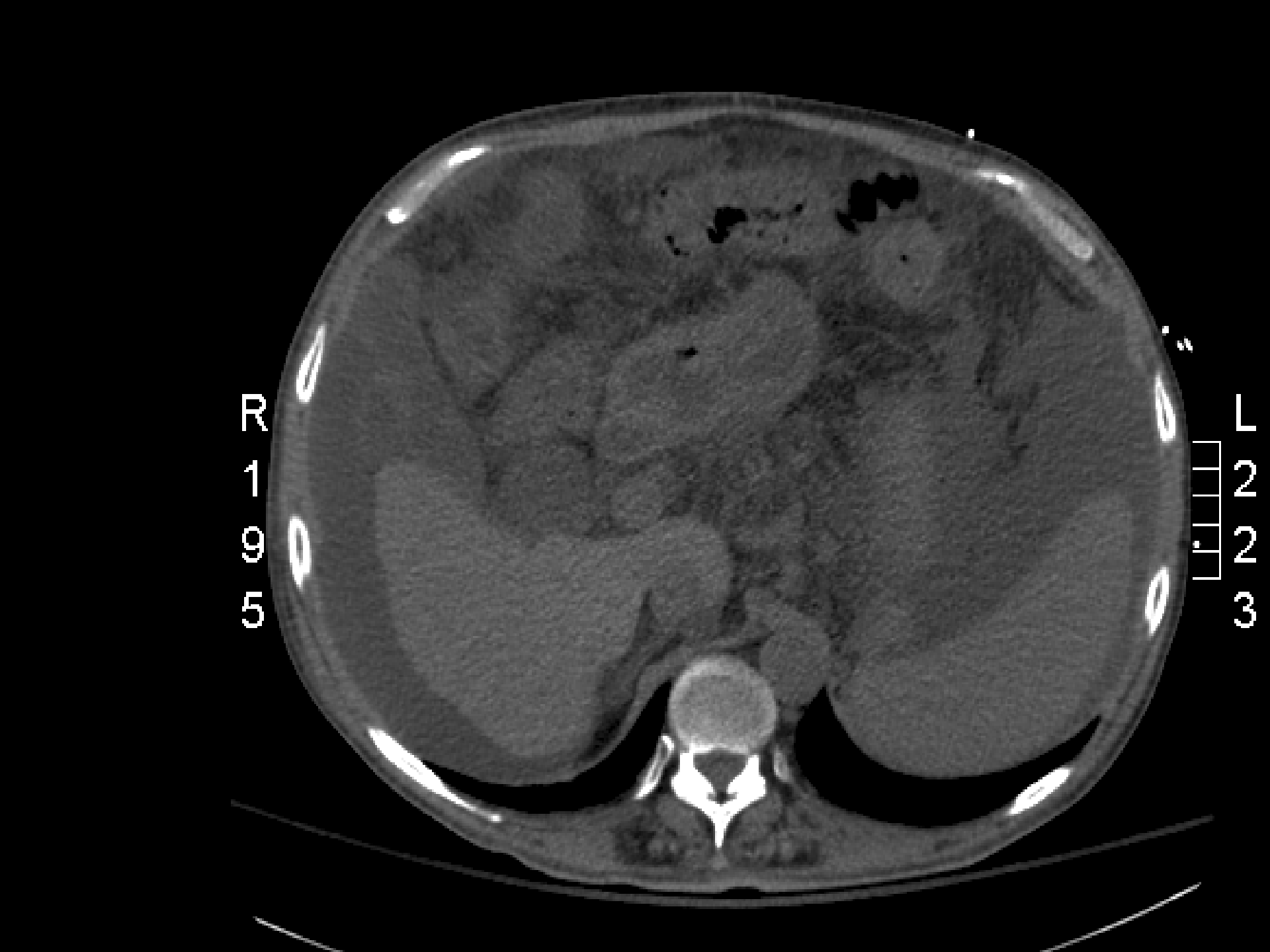
- Periumbilical abdominal pain
- Unreducible bulge
- No nausea or vomiting
- Passing flatus
- No fever or chills
- Recent incarcerated umbilical hernia- reduced in ED

Exam

- Temp 96.3, HR 56, BP 106/71, RR 18
- Abdomen with incarcerated hernia just superior to umbilicus, red, tender, tense

- Calculated MELD 18


SUPINE
R
KSK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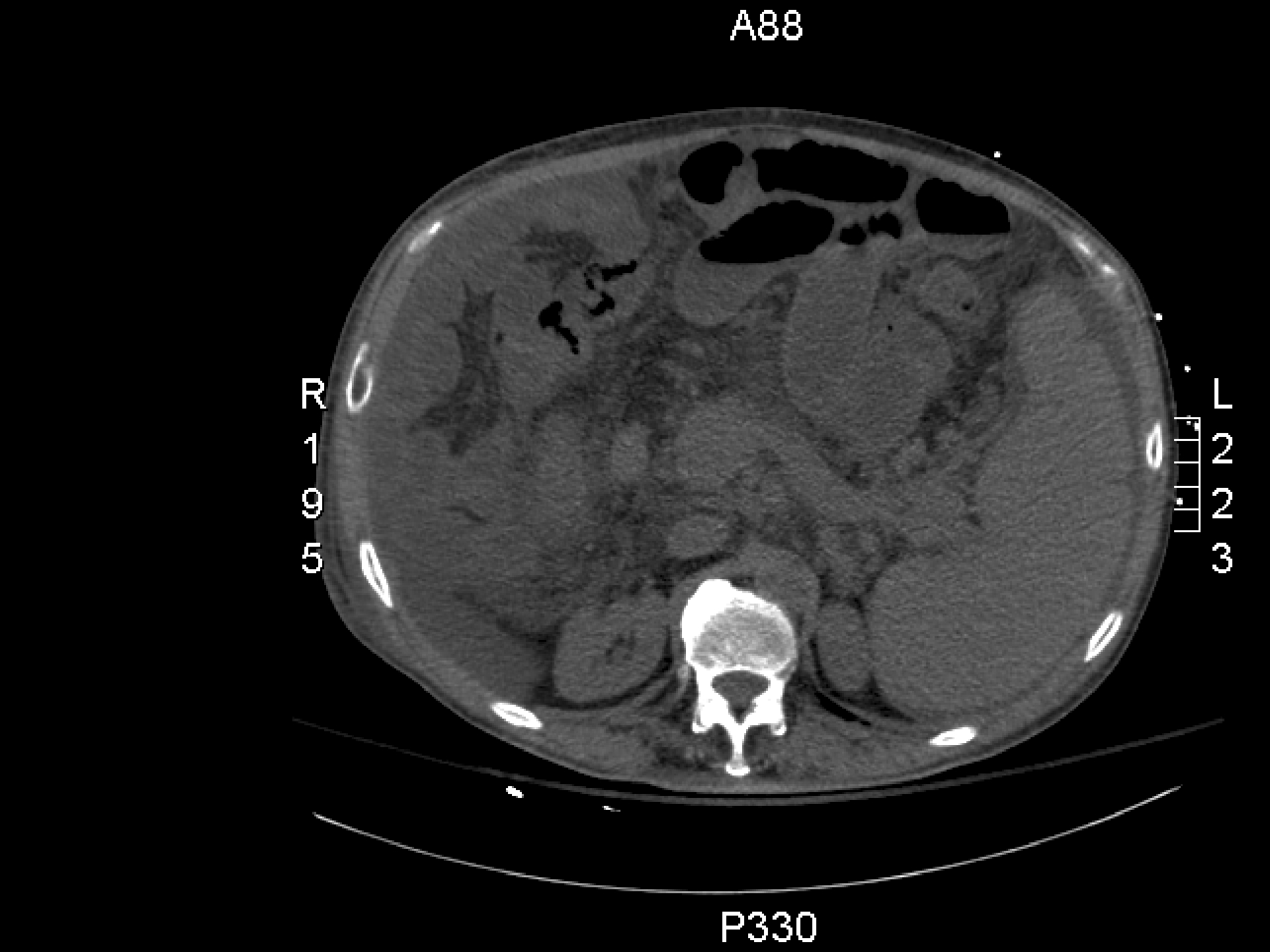
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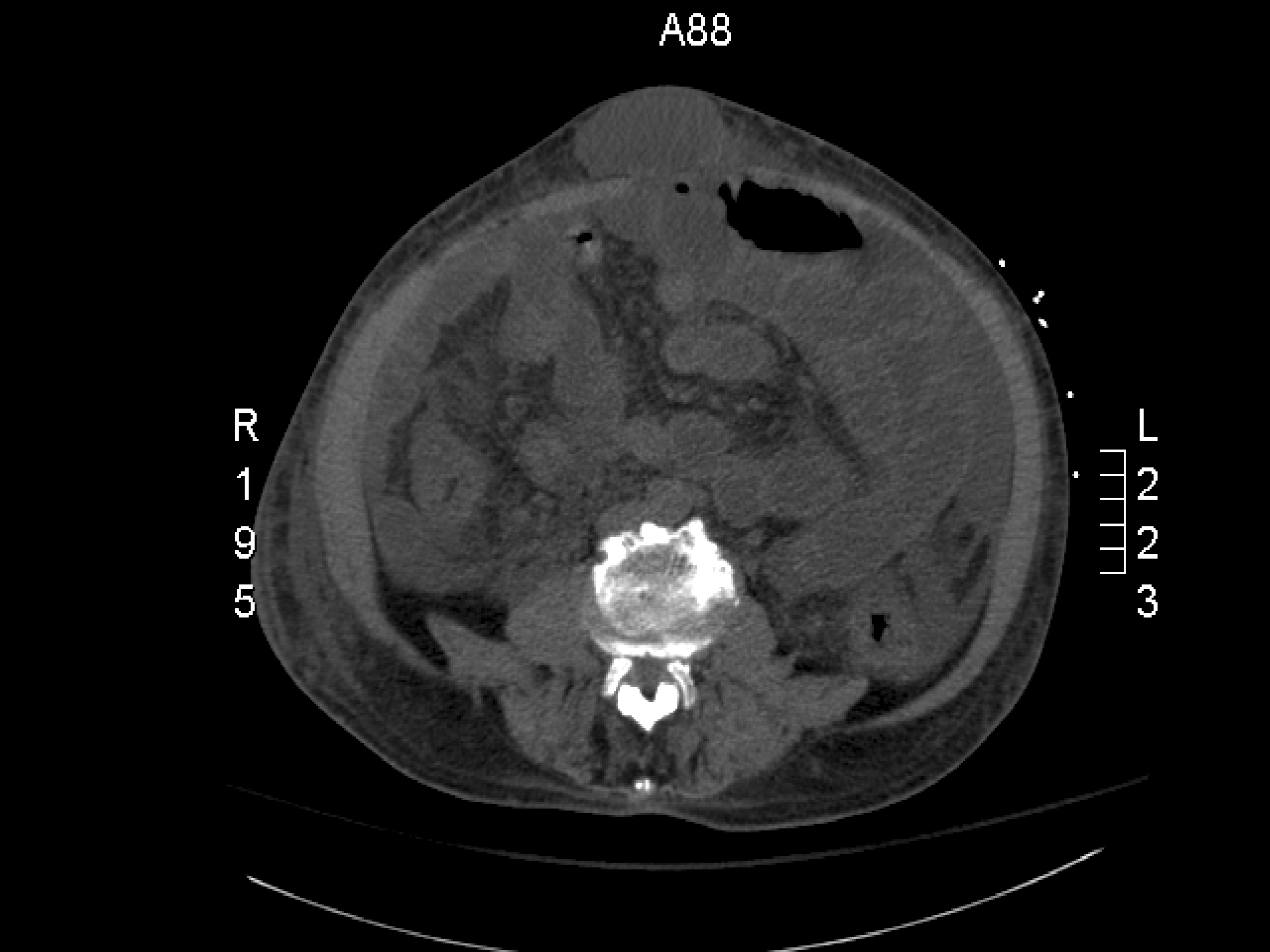
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- To OR for repair of incarcerated ventral hernia
- Uncomplicated post-operative course

- Readmitted several times with progression of liver disease
  - Acute GI bleed
  - Worsened encephalopathy
  - Ascites requiring paracentesis
  - Hepatorenal syndrome
  - MELD 34

- Proceeds to Orthotopic liver transplantation
- Post-operative course complicated by re-exploration for bleeding, and persistant renal failure requiring dialysis
- Required creation of left brachio-cephalic fistula for HD access
- Referred for evaluation for kidney transplantation

Renal Transplant Workup

- History
  - Dialysis history
  - Amount of urine produced
  - Urologic problems
  - Exposures leading to sensitization (blood transfusions, previous transplant, pregnancy)
- Exam
  - Previous procedures
  - Vascular exam (especially femoral vessels)

Renal Transplant Workup

- Labs
  - ABO/HLA typing
  - PRA
  - Infectious disease (CMV, EBV, HBC, HCV, HIV, RPR)
- Imaging
  - CXR
  - EKG
- Cancer screening
- Echo/stress test

- Living unrelated donor kidney transplant 18 months after liver transplant
- PRA 0, 3 Ag MM
- Induce with campath/solumedrol

Miscellaneous Transplant Topics

Brain Death

- Acute catastrophic cerebral event
- Exclusion of conditions that may mimic brain death
  - Metabolic derangements
  - Intoxications
  - hypothermia
- Presence of coma or unresponsiveness
- Absence of response to painful stimuli
- Absence of brainstem reflexes
- Apnea

Apnea Test

- Pre-requisites:
  - Core temp >36.5 celcius
  - SBP >90 mm Hg
  - Corrected DI
  - Normal arterial PCO2
- Pre-oxygenate with 100% oxygen for 30 minutes
- Disconnect from ventilation
- Deliver 100% oxygen at level of carina
- Watch for respiratory movements
- Measure PO2, PCO2 and and pH after 10 minutes and reconnect the ventilator
- Carbon dioxide >60 mm Hg or increase by 20 is a positive test
- If arterial pressure drops to <60 or patient desaturates, test is terminated

Rejection

- Hyperacute (minutes to hours)
  - Due to presence of preformed antibodies against HLA class I or ABO
  - Treat with emergent re-transplant
- Accelerated (<1 week)
  - Caused by sensitized T cells to donor antigens
  - Treat by increasing immunosuppression
- Acute (1 week to 1 month)
  - Caused by T cells
  - Treat by increasing immunosuppression
- Chronic (months to years)
  - Gradual loss of graft function
  - Sensitized T cells and antibody formation
  - No good treatment

Immunosuppression

- Induction-
  - Thymoglobin
    - Rabbit polyclonal antibodies against T cell antigens
  - OKT3
    - Monoclonal antibodies that inhibit T cell receptor complex
    - Side effects: fever, chills, pulmonary edema, shock
- Maintainence
  - Corticosteroids
    - Inhibit genes for cytokine synthesis (IL-1, IL-6) and macrophages
    - Side effects: diabetes, htn, osteopenia, cushinoid changes
  - Calcineurin inhibitors (cyclosporine, tacrolimus)
    - Side effects: nephrotoxicity, neurotoxicities, gingival hyperplasia (cyclosporine), alopecia (tacrolimus)
  - Cellcept
    - Inhibits de novo purine synthesis
    - Side effects: leukopenia, GI symptoms

Long-Term Complications of Transplantation

- Rejection
- Recurrence of primary disease
- Infections
- Hypertension
- Hyperlipidemia
- Post-transplant diabetes mellitus
- Malignancy

Management of ESRD

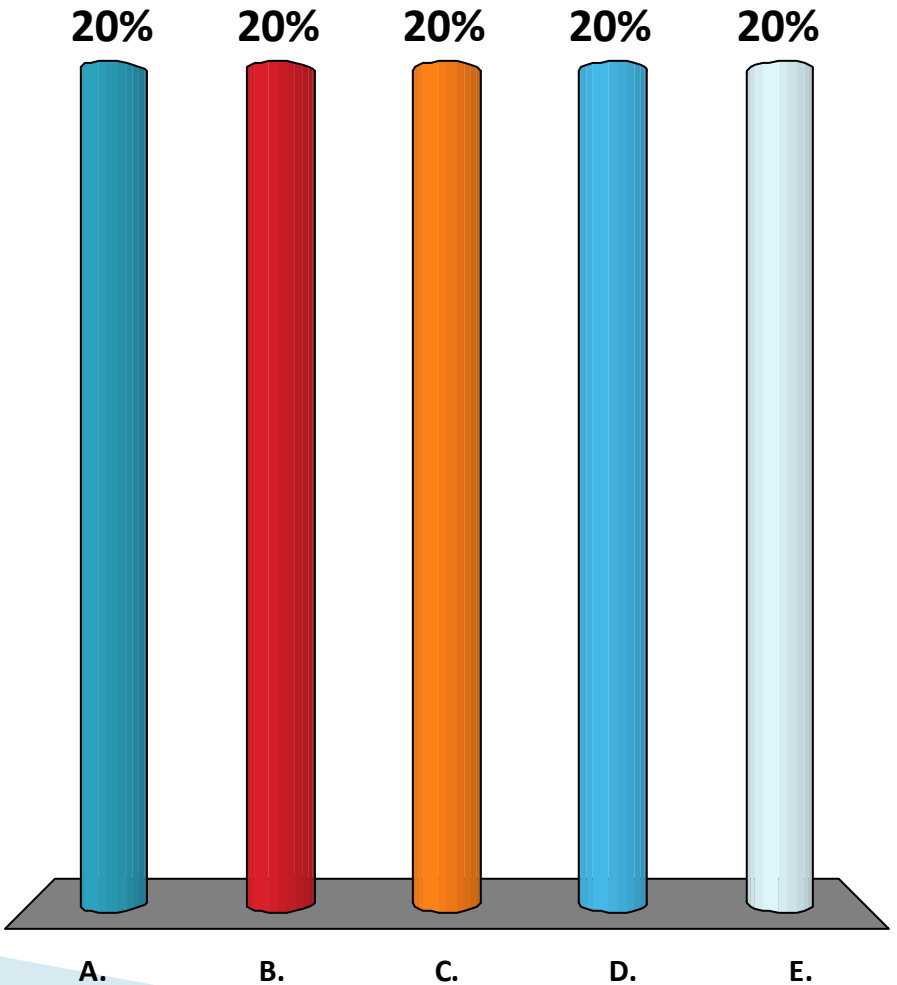
- Management of volume status and electrolytes
- Consider ddAVP
- Strict glycemic control
- Management of comorbidities, including PVD
- Early fistula
  - Minimize blood draws to protect sites

Management of ESLD

- Assess degree of underlying liver disease
- Minimize sodium administration
- Early enteral nutrition

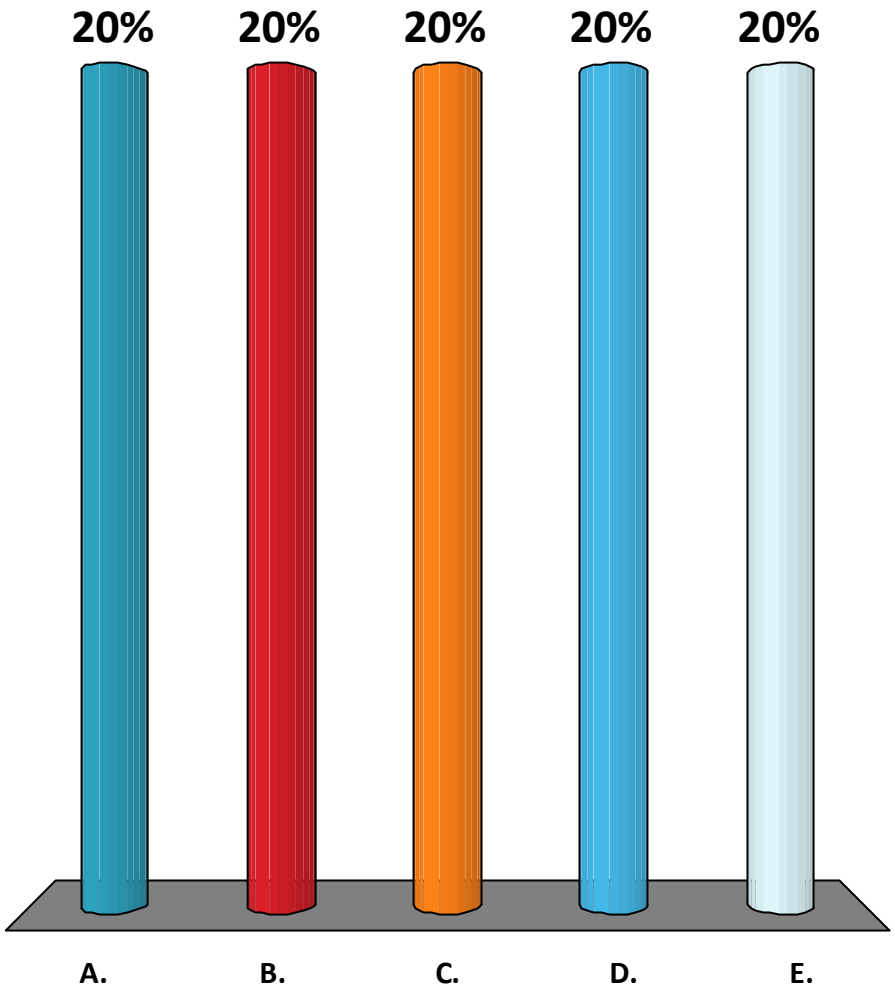
Three months after deceased donor kidney transplant, a 50 year old man comes to the ED with malaise, abdominal pain, diarrhea and nausea. The patient has been treated for acute rejection within the past 2 weeks and the prednisone dose is being tapered. Physical exam shows diffuse epigastric tenderness. Serum creatinine has risen from 1.4 to 2.0 mg/dL over the past two weeks. Which of the following statements is TRUE?

A. Renal graft MRA should be obtained
B. Colonoscopy is indicated
C. Upper GI endoscopy should be done
D. The prednisone dose should be increased
E. He should receive H pylori therapy as an outpatient



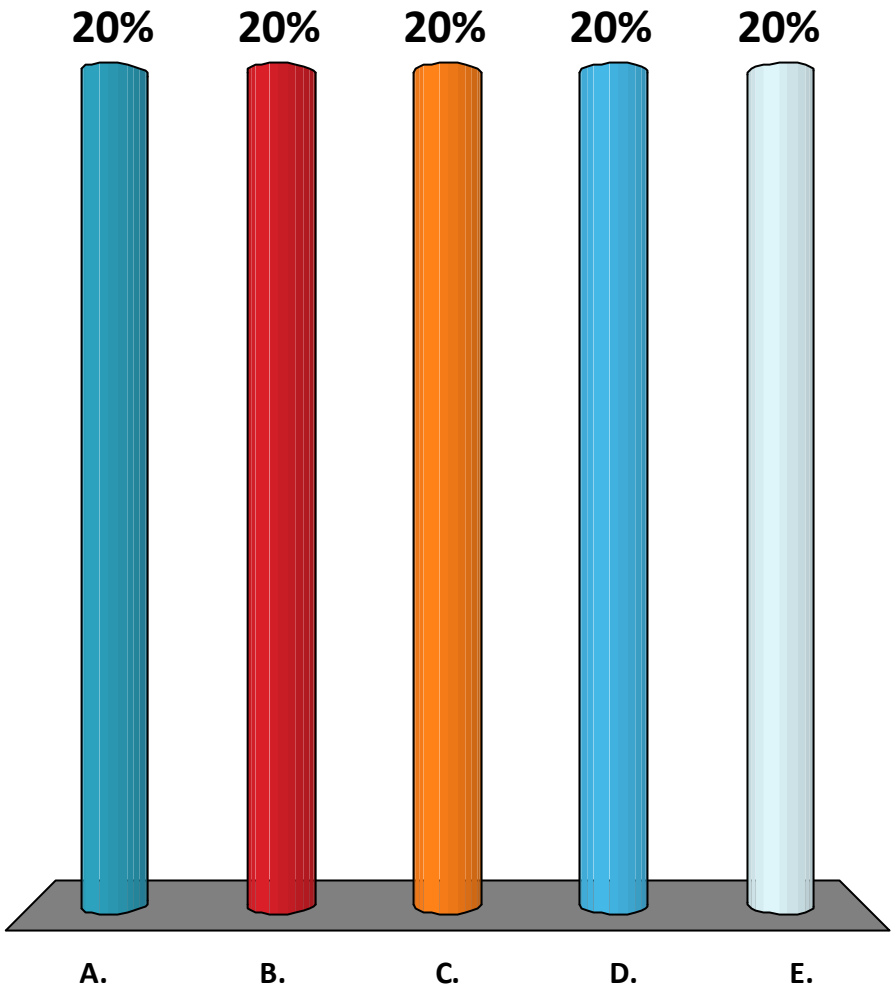
Which of the following is an absolute contraindication for liver transplantation?

A. Autoimmune hepatitis
B. Hepatitis C infection
C. Synchronous extrahepatic malignancy
D. Hepatitis B infection
E. Fulminant hepatic failure



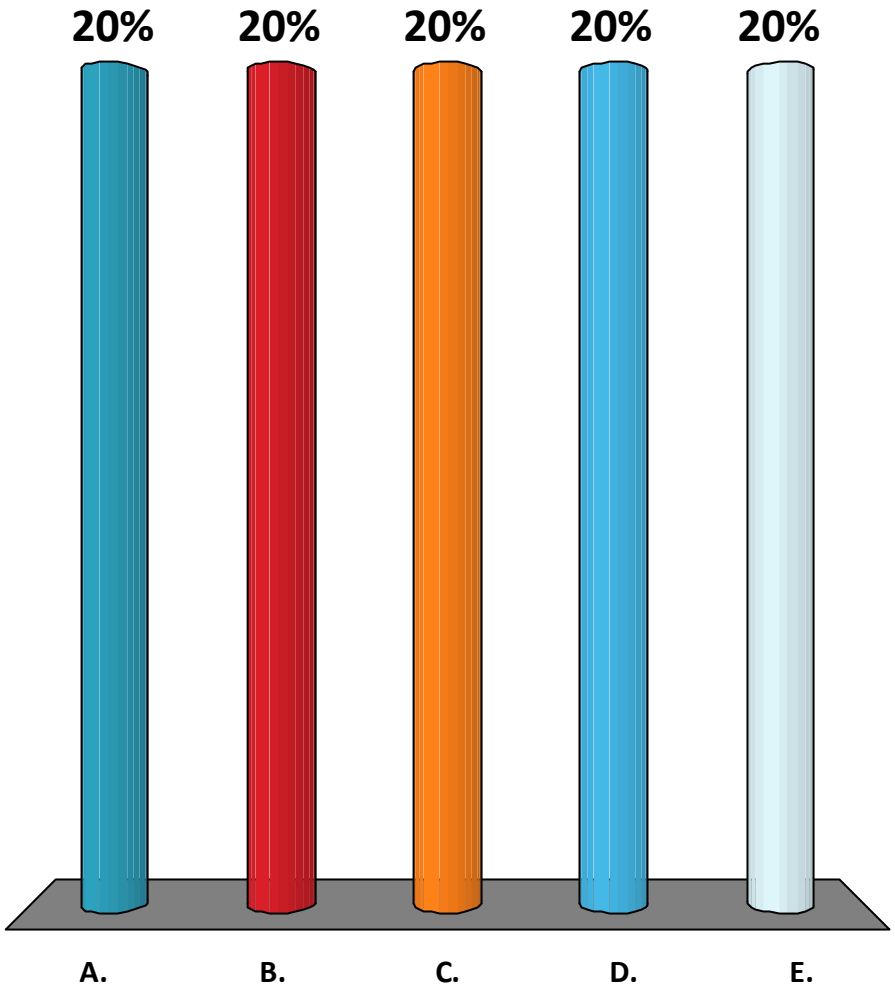
Liver transplantation is contraindicated for a

A. 56 year old man 4 days after OLT who has acute hepatic artery thrombosis and for whom arterial thrombectomy was unsuccessful
B. A 48 year old man with alcoholic cirrhosis who has been abstinent for 5 years
C. A 68 year old women with nonalcoholic cirrhosis related to fatty liver disease.
D. A 52 year old man with cirrhosis who has undergone wedge resection of a 5 mm focus of HCC involving the middle lobe of the right lung.
E. 32 year old woman in the ICU with variceal bleeding who has portal htn due to hepatitis C cirrhosis



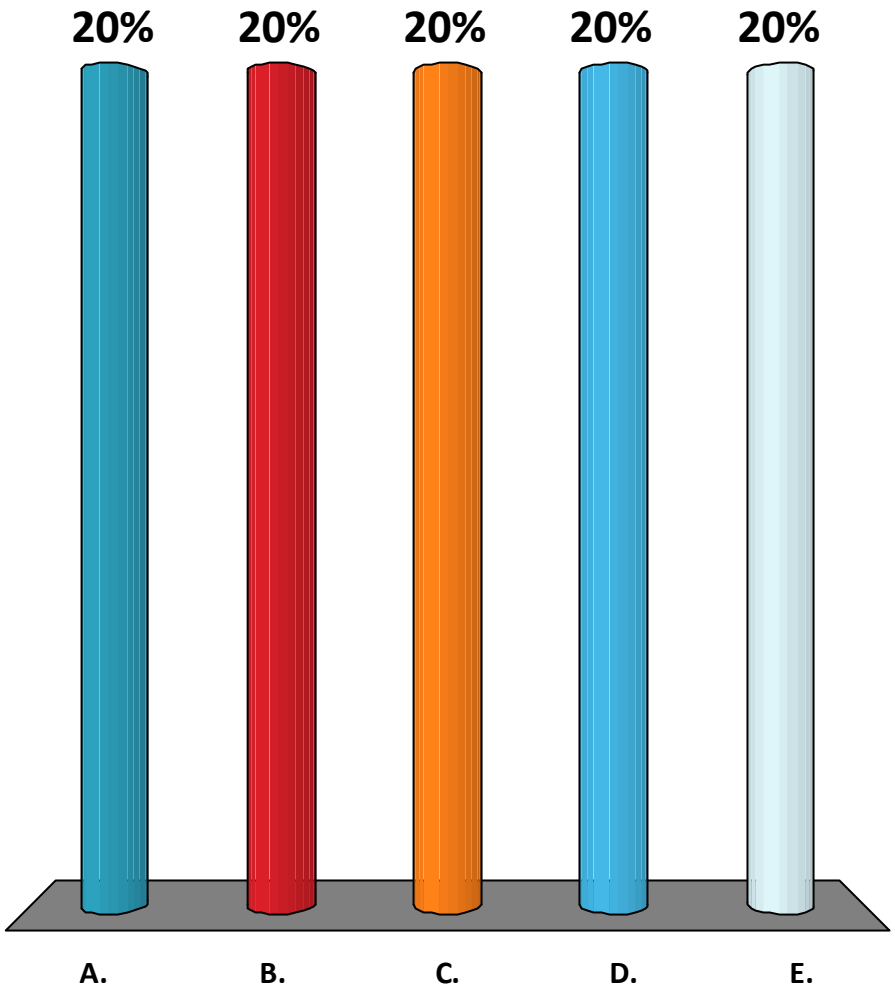
After receiving a renal transplant, a patient is started on a regimen of tacrolimus, corticosteroids, mycophenolate mofetil and trimethoprim-sulfa. Two weeks after transplant, she develops seizures. The most likely cause is:

A. Tacrolimus toxicity
B. Corticosteroid toxicity
C. Mycophenolic acid toxicity
D. Rejection
E. meningitis



Posttransplant lymphoproliferative disorder

A. Is usually seen 1 year or more after transplant
B. Is most common in liver transplant recipients
C. Is related to herpes virus infection
D. Can be treated with rituximab
E. Requires excisional biopsy for diagnosis



Which of the following statement about acute rejection is NOT true?

A. It is T-cell mediated
B. It is related to organ-host human leukocyte antigen disparity
C. Treatment can save the grafted organ in 90% to 95% of cases
D. It does not occur with living related donors
E. It is associated with an increased risk of chronic rejection