1. A patient with a history of renal carcinoma presents with a painful pelvic mass six weeks following a percutaneous lymph node biopsy. What does the pelvic arteriogram show?

A. Acquired arteriovenous fistula
B. Congenital arteriovenous malformation
C. Vascular metastasis
D. Hemodialysis access graft

Findings:
Just above the left hip joint there is a saccular dilation of the external iliac artery with communication to and early opacification of the left iliac vein and vena cava.

Rationales:
A. Correct. Arteriovenous fistulas are point-to-point communications between an artery and a vein. Acquired conditions, the most common etiology in a hospital setting, is iatrogenic.
B. Incorrect. Arteriovenous malformations are high-flow congenital lesions. The distinguishing feature from acquired arteriovenous fistulas is the central tangle of communicating arterioles and venules termed “the nidus.”
C. Incorrect. Metastases from renal cell carcinoma can be very vascular with arteriovenous shunting, but there is no vascular metastasis present here to be seen.
D. Incorrect. Grafts are placed usually below the hip joint and the synthetic material connecting the artery and vein is recognizable.

Citations:
2. A 67-year-old man presents with acute onset of back pain. You are shown a thoracic aortogram. What is the MOST likely diagnosis?

A. Intraluminal thrombus  
B. Traumatic laceration  
C. Dissecting hematoma  
D. Mycotic aneurysm

Findings:  
Arising just distal to the left subclavian artery, there is a double-barrel descending thoracic aorta with dense filling of the compressed true lumen, a less densely opacified false lumen, and an intimal flap between.

Rationales:  
A. Incorrect.  
B. Incorrect.  
C. Correct. Aortic dissection is the separation of the intima from the adventia by blood within the medial layer of the artery.  
D. Incorrect.

Citations:  
3. Concerning inferior vena cava filters, which statement is TRUE?

A. Removable filters are not available.
B. The ideal location for filter placement is at the iliac vein confluence.
C. Current filters require surgical cut down for placement.
D. Current filters can be placed from femoral or jugular venous approach.

Rationales:
A. Incorrect. Removable filters are now commercially available.
B. Incorrect. The ideal location is just below the renal veins.
C. Incorrect. Most devices are placed percutaneously.
D. **Correct.** Current devices can be placed via a transfemoral or transjugular access.

Citations:

4. Child-Pugh, Apache II and MELD are all scoring systems that may be used for assessing the severity of disease affecting which organ?

A. Liver
B. Kidney
C. Lung
D. Brain

Correct answer: A

Rationales:
MELD stands for Model End Stage Liver Disease. All three scoring systems have been used to predict the outcome of patients undergoing TIPS procedures.

5. Concerning ultrasonography of the superficial femoral artery, which one is TRUE?

A. There is reversal of the direction of flow in early diastole in a normal artery at rest.
B. There is reversal of the direction of flow in late diastole in a normal artery after exercise.
C. There is accelerated velocity of flow through a short segment occlusion with exercise.
D. Peak systolic velocity is increased though the superficial femoral artery in the presence of a stenotic iliac artery.

Correct answer: A
Rationales:
A brief reversal of flow direction is normal in the superficial femoral artery during early diastole at rest. With exercise the flow changes from high to low resistance with increased antegrade flow throughout diastole. Regardless, with or without exercise antegrade flow is normal in late diastole. An iliac artery stenosis dampens flow down stream and there is no flow through an obstruction.

6. A patient with symptomatic fibroids is considering uterine artery embolization. Which one is CORRECT advice?

A. There is an 80% to 90% chance of the procedure producing menopause.
B. There is an 80% to 90% chance of the procedure producing relief of symptoms.
C. The fibroids will shrink by 80% to 90%, but may not go away completely.
D. There is an 80% to 90% chance of being released from the hospital in 3-5 days.

Rationales:
A. Incorrect. The incidence of premature menopause following the procedure is approximately 2-5%.
B. Correct. This is why the treatment is effective.
C. Incorrect. Following treatment, fibroids on average will reduce in volume only by 40-60%.
D. Incorrect. If not done as an out-patient, most patients go home the next day.

7. You are shown an image from a celiac arteriogram. What abnormality is present?
A. Median arcuate ligament syndrome
B. Occlusion of the splenic artery
C. Occlusion of the portal vein
D. Gastric arteriovenous malformation

Findings: There is no proximal opacification of the proximal splenic artery. In its place there are numerous enlarged, tortuous arterial branches in the fundus of the stomach representing well developed collateral blood supply from the left gastric and right gastroepiploic arteries shunting the occluded splenic artery and eventually reopacifying splenic artery branches at the hilum of the spleen.

Rationales:
A. Incorrect. Gastroduodenal artery collaterals will develop in median arcuate ligament syndrome. The direction of flow is from the superior mesenteric artery to the celiac along the course of the duodenal sweep to bypass the proximal stenosis of the celiac artery.
B. Correct. The findings are those of a chronic occlusion of the splenic artery.
C. Incorrect. The splenic vein may well be occluded in this patient, were the splenic artery occluded by pancreatic carcinoma, but the patency of the splenic or portal vein cannot be determined from this arterial image.
D. Incorrect. The tangled collateral arteries in the fundus of the stomach should not be mistaken for an arteriovenous malformation because there is no early opacification of the draining veins.

Citation:

8. Concerning dysfunctional dialysis access grafts, the underlying abnormality is MOST frequently found:

A. at the arterial anastomosis
B. mid graft
C. at the venous anastomosis
D. involving central veins

RATIONALES:
C. Correct. The patency of hemodialysis access grafts becomes compromised primarily by areas of intimal fibromuscular hyperplasia and perivenous fibrosis causing stenoses that develop in response to turbulence and shear stress. Most commonly these events obstruct the venous outflow, primarily at the graft-to-vein anastomosis.

References:
9. When percutaneous nephrostomies are performed, needle placement into posterior calyces is preferred to anterior calyces because:

A. the colon is more likely to be anterior to the kidney.
B. Broedel’s line extends through the posterior calyces.
C. the guide wire will take a less angled path using the posterior calyces.
D. stones are less likely to form in the posterior calyces.

RATIONALITY:
A. Incorrect. The colon is usually anterior to the kidney, where hopefully it is out of the way of the needle. Regardless, its position is not a consideration when choosing between an anterior or posterior calyx.
B. Incorrect. Broedel’s line, demarking an avascular plane, is halfway between the anterior and posterior calyces.
C. Correct. Percutaneous nephrostomies are performed with the patient prone. When using a posterior approach, the arrangement of the calyceal anatomy makes it easier to advance a guidewire through a needle in a posterior calyx into the renal pelvis than from an anterior calyx. The angle the guidewire must make with the needle is much more acute when trying to thread the infundibulum from an anterior calyx.
D. Incorrect. I am uncertain whether stones are more or less likely to form in the posterior calyces, but this is not why posterior calyces are preferred.

References:

9. Concerning transhepatic arterial chemoembolization (TACE) of hepatocellular carcinoma, which one of the following is TRUE?

A. TACE is the treatment option of choice for hepatocellular carcinoma.
B. TACE will prolong survival compared to systemic infused chemotherapy.
C. The effectiveness of TACE depends greatly on the choice of drugs used.
D. Thrombosis of the portal vein will increase the effectiveness of TACE

RATIONALITY:
A. Incorrect. Although 20% or fewer qualify, the only options for cure are resection or transplantation.
B. Correct. TACE has been proved to prolong survival compared to systemic infused chemotherapy. It is a useful treatment for unresectable hepatocellular carcinoma.
C. Incorrect. Multiple different drug regimens exist and no consensus has been reached as to which is best.
D. Incorrect. Portal vein thrombosis is sometimes considered a contraindication to TACE because of the danger of infarcting the liver. Regardless, patients with portal vein thrombosis have a worse prognosis than those without.

References:

11. A 39-year-old male cigarette smoker with a past history of thrombophlebitis presents with lower extremity rest pain. An arteriogram shows distal arterial occlusive disease with prominent “cork-screw” collateral vessels. What is the MOST LIKELY diagnosis?

A. Buerger’s disease
B. Diabetes
C. Cholesterol emboli
D. Bechcet’s disease

RATIONALE
A. Correct. Buerger’s disease should be suspected in any patient presenting with peripheral vascular disease before the age of 45. There is a strong association with cigarette smoking and male gender. Migratory thrombophlebitis is also a feature of the disease.

References: