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Case of the Day
Question
What is your diagnosis?

1) Superior mesenteric artery (SMA) dissection
2) Mesenteric venous ischemia
3) Intestinal angioedema
4) Shock bowel syndrome
5) Cytomegalovirus (CMV) enterocolitis
Answer: 2) Mesenteric venous ischemia

Imaging features
Contrast-enhanced CT shows cavernous transformation with occlusion of extrahepatic portal vein. Contrast-enhanced CT scans show diffuse wall thickening with target sign in the small bowel and colon. Coronal-reformatted contrast-enhanced CT shows filling defects in the superior mesenteric vein.

Discussion
Venous causes of acute mesenteric ischemia are less common (5%-15% of cases), and are most often the result of a thrombosis of the superior mesenteric vein (SMV). Contrast-enhanced CT permits evaluation of vascular structures, the bowel wall, and the adjacent mesentery. Sensitivity rates reach at least 90%. CT findings of mesenteric venous thrombosis include persistent, well-defined intraluminal filling defects with central low attenuation, which may be surrounded by well-defined, rim-enhancing venous walls. Accompanying collateral circulation, engorgement of mesenteric veins, and mesenteric edema may be present. The most common manifestation of accompanying bowel ischemia is bowel wall thickening. This nonspecific finding may manifest as a target sign, with alternating intramural areas of high and low attenuation resulting from submucosal edema or hemorrhage. Other CT findings include peritoneal fluid, bowel dilatation, or intestinal penumatosis. Acute mesenteric ischemia with signs of bowel infarction or peritonitis is generally an indication for immediate surgery to resect involved segments of intestine.

References
**Case 2.**

**Breast by Jin You Kim**

F/49, Chief complaint: Palpable lump in the right breast

**Question**

What is the most probable diagnosis?

1) Phyllodes tumor
2) Tubular carcinoma
3) Mucinous carcinoma
4) Papillary carcinoma
5) Tubular carcinoma
Answer: 3) Mucinous carcinoma

Imaging features
Mammography (mediolateral oblique view) (Fig. 1) shows an oval equal density mass with partially circumscribed and partially indistinct margins. Ultrasonography (Fig. 2) demonstrates a partially microlobulated isoechoic mass with posterior acoustic enhancement. A sagittal contrast-enhanced T1-weighted MR image (Fig. 3) of the right breast shows an oval mass with rim enhancement. A sagittal T2-weighted MR image (Fig. 4) shows a mass with an area of high intratumoral signal intensity. Axial ADC map (Fig. 5) shows a high signal corresponding to this tumor.

Discussion
1. Clinical characteristics
   1) Uncommon special type of invasive ductal carcinoma characterized by large amounts of extracellular mucin (1–4% breast cancer)
   2) Slow growing, more favorable prognosis than IDC NOS

2. Histology
   1) Pure type: ≥90% of tumor shows mucin production, better prognosis
   2) Mixed type: tumors with less extensive mucin = Invasive ductal carcinoma with mucinous features

3. Radiologic findings
   1) Mammography
      Round, oval, or irregular, dense mass/ Partially indistinct margins, microlobulated in 39%
      Irregular shape and spiculated or indistinct margins may be seen with mixed type.
      Calcifications not characteristics: Amorphous, punctate, rarely pleomorphic
      Approximately 20% not detected by mammography
   2) Ultrasonographic findings
      Variable shape: Round, oval or irregular / Partially circumscribed or microlobulated margins
      Posterior enhancement in >50% / Vascularity noted in ~1/3 of tumors
   3) MRI
      T1WI: smooth or indistinct, oval or microlobulated mass
      High T2 signal intensity due to large mucin component
      T1WI C+ FS: Avid enhancement/ Rim enhancement reflects tumor cell clusters at periphery of central mucin pools/ persistent or plateau kinetics
      DWI: hyperintense with high ADC values
References

Neuroradiology by Jeong A Yeom

Case 3.
Question
What is your diagnosis?

1) Cytomegalovirus
2) X-linked subependymal heterotopia
3) Tuberous sclerosis complex
4) Neurofibromatosis
5) Sturge-Weber syndrome

Answer: 3) Tuberous sclerosis complex

Imaging features
1. Streaky linear or wedge-shaped hyperintensities at cerebral hemisphere (temporal/ frontal, parietal/ frontal) on T2WI and FLAIR.
2. Rt hemispheric atrophy
3. No evidence of diffusion restriction.
4. Calcified subependymal nodules at both lateral ventricular wall.

Discussion
Tuberous sclerosis complex (TSC) is a multisystem congenital syndrome with widespread CNS anomalies. The clinical neurologic manifestations include epilepsy and cognitive impairment. The intracranial features of TSC are cortical or subcortical tubers, subependymal nodules, subependymal giant cell astrocytomas, and white matter radial migration lines.

References
34/F, Chief complaint: Right shoulder pain (6 months)

**Question**
What is your diagnosis?

1) Bankart lesion
2) Perthes lesion
3) HAGL lesion
4) ALPSA lesion
5) Bennett lesion
Answer: 4) ALPSA lesion

Imaging Findings
Axial MR arthrogram T1WI FS of an ALPSA lesion shows the torn anteroinferior labrum displaced medially, adjacent to the scapular neck. Coronal MR arthrogram T1WI FS of an ALPSA lesion shows the displaced labrum inferior to the scapular neck.

Discussion
Recurrent anterior shoulder instability has been associated with anterior labroligamentous periosteal sleeve avulsion (ALPSA) lesions. It results from an anterior labral injury in which the labrum is avulsed, but the periosteum attaching the labrum to the glenoid is not ruptured, unlike the classic Bankart lesion.

Traumatic anterior shoulder instability is usually associated with a capsulolabral avulsion from glenoid rim, called classic Bankart lesion. However, anterior shoulder instability can often be associated with not only capsulolabral lesions but also intra-articular lesions, such as glenoid erosion and bone defects, Hill–Sachs lesions, SLAP, and rotator cuff tears. These intra-articular lesions may also contribute to recurrence of anterior shoulder instability after stabilization procedures. A variant of the classic Bankart lesion is the Perthes lesion, in which scapular periosteum remains intact but is stripped medially. Another variation in the capsulolabral lesion is ALPSA lesion in that the anterior scapular periosteum does not rupture, thereby allowing the capsulolabral structures to displace medially and rotate inferiorly on the scapular neck and heal eventually on the scapular neck. The most important feature that differentiates this condition from avulsion of the anterior inferior glenohumeral ligament and labral complex from the anterior rim of the glenoid (i.e., Bankart lesion) is that the anterior scapular periosteum does not rupture.

References
A 52-year-old woman with arteriovenous malformation (AVM). Nonenhanced CT (a) shows high density hemorrhage in right renal pelvis. Contrast enhanced axial (b) and coronal (c) CT reveals conglomerate of vessels in the lower pole of the right kidney. Doppler image (d) also demonstrates vascular structures in the lower pole of the right kidney. Right renal angiography (e) shows nidus at the lower pole of kidney with early draining vein the AVM. After embolization of feeder to the nidus with NBCA, no hematuria was evident.

**Question**
What is your next option?
1) Stent insertion
2) Stentgraft insertion
3) Thrombolysis
4) Embolization
5) Follow-up

**Answer:** 4) Embolization

**Imaging findings**
A 52-year-old woman with arteriovenous malformation (AVM). Nonenhanced CT(a) shows high density hemorrhage in right renal pelvis. Contrast enhanced axial(b) and coronal(c) CT reveals conglomerate of vessels in the lower pole of the right kidney. Doppler image(d) also demonstrates vascular structures in the lower pole of the right kidney. Right renal angiography(e) shows nidus at the lower pole of kidney with early draining vein the AVM. After embolization of feeder to the nidus with NBCA, no hematuria was evident.

**Brief discussions**
Renal arteriovenous malformations (AVMs) are rare vascular disorders, which may require treatment as they are frequently associated with gross hematuria. Other symptoms include flank pain, hypertension, and high-output heart failure. Treatment for renal AVMs has evolved from partial or total nephrectomy to transcatheter embolization. The development of microcatheter systems enabled the selective embolization of renal AVMs with preservation of the renal parenchyma. As the result, the frequency of post-embolization syndrome, which consists of fever, loin pain, nausea, and vomiting, has been significantly reduced. Contemporary embolization techniques aim to permanently occlude the multiple small channels between arteries and veins, which form the nidus of the AVM. Several embolization agents used in the past, such as gelatin sponge particles, stainless steel or platinum microcoils, or polyvinyl alcohol are not adequate for the procedure because of high recanalization rate and subsequent recurrence of hematuria. Recently, absolute alcohol or n–butyl 2–cyanoacrylate (NBCA) mixed with lipiodol has provided good outcomes, in terms of safety, efficacy, and duration of results.

**References**
Question
What is your diagnosis?

1) Mediastinal hemangioma
2) Intrathoracic goiter
3) Mediastinal paraganglioma
4) Thymic carcinoid
5) Thoracic aneurysm

Answer: 3) Mediastinal paraganglioma

Imaging features
Contrast-enhanced CT images demonstrate a vividly enhancing mass in the aortopulmonary window. On MR images, the mass shows intermediate signal intensity on T1WI and slightly high signal intensity on T2WI, and intense enhancement. No calcification is demonstrated in the lesion.

Discussion
Thoracic paragangliomas are rare, constituting only 1–2% of all paragangliomas, and making up less than 1% of mediastinal tumors. Most occur in the mediastinum, of which two main groups can be identified based on anatomic location and innervation: (1) mass arising from the parasympathetic paraganglia in the anterior mediastinum; and (2) mass arising from the sympathetic chain along the
paravertebral area. Paragangliomas arising from the parasympathetic paraganglia are usually located in the aortopulmonary window in patients older than 40 years. Patients may be asymptomatic, with the tumor being detected incidentally. Approximately half of patients demonstrate symptoms related to the functional activity of the tumors.

Best diagnostic clue is a well-enhancing mass located in characteristic sites, either the aortopulmonary window or the posterior mediastinum. On non-enhanced CT, paragangliomas have no characteristic features. However, after contrast enhancement, paragangliomas demonstrate vivid enhancement. Some tumors have extensive hemorrhage or cystic degeneration. Angiography usually shows marked hypervascularity, multiple feeding vessels, and a homogeneous capillary blush. Mediastinal paragangliomas show homogeneous or heterogeneous intermediate signal intensity similar to that of liver on T1-weighted MR images. On T2-weighted images, increased signal intensity greater than liver parenchyma but less intense than subcutaneous fat is observed.

The only effective treatment is complete resection, which may result in a surgical challenge because of its proximity to the heart, great vessels, and trachea, often rendering a complete resection difficult to achieve.

References

Question
What is your diagnosis?

1) Coronary artery fistula
2) Myocardial bridging
3) ALCAPA (anomalous left coronary artery from the pulmonary artery)
4) Dual LAD (left anterior descending coronary artery)
5) Single coronary artery
Answer: 5) Single coronary artery

Imaging features
The maximum intensity projection axial images of computed tomography coronary angiography show single coronary artery arising from the left sinus of vallalva with right coronary artery (RCA) arising from the mid left anterior descending artery (LAD). Volume-rendered 3-dimensional images demonstrate the RCA from the mid LAD and coursing anterior to the main pulmonary artery.

Discussion
Single coronary artery is among the rarest of coronary artery anomalies, with a prevalence of 0.024% to 0.066% in the general population. It is most commonly found as an isolated finding (60%), but it has also been associated with other congenital heart disorders (40%) with a higher mortality. This anomaly shows a single coronary artery arises from the aorta. This single coronary artery provides blood supply to the entire heart. The classification proposed by Lipton et al is most commonly accepted and divides single coronary artery into 3 groups according to the location of the ostium, the anatomical distribution, and the course of its branches. In group I, the artery follows the anatomic course of LCA or RCA. In group II, one coronary artery arises from the proximal part of the normally located other coronary artery. In group III, the LAD and left circumflex artery each arise separately from the normally positioned RCA. Single coronary artery is thought to be associated with a risk of sudden cardiac death, even in patients without a malignant arterial course. It is due to high coronary flow, which may predispose to early atherosclerotic disease through endothelial injury. Currently, there are no treatment guidelines or follow-up recommendations. Revascularization is recommended only with significant atherosclerosis and documented ischemia.

References
Question
What is your diagnosis?

1) Lymphoma
2) Inflammatory myofibroblastic tumor
3) Hemangioma
4) Angiosarcoma
5) Sclerosing angiomatoid nodular transformation

Answer: 5) Sclerosing angiomatoid nodular transformation
Imaging features
Contrast-enhanced CT shows a hypodense mass in the spleen.
On T2-weighted image, the splenic mass shows hypointensity.
Dynamic gadolinium-enhanced fat-suppressed T1-weighted images show the delayed progressive enhancement of the splenic mass.

Discussion
Sclerosing angiomatoid nodular transformation (SANT) is a recently described benign vascular splenic lesion consisting of multiple angiomatoid nodules surrounded by dense fibrous tissue that often coalesces centrally to form a scar. The term SANT first described in the literature in 2004 by Martel et al. The majority of lesions seem to be incidentally found on imaging.
SANT shows characteristic CT and MRI findings reflecting the underlying pathology. Typical features are a solitary, round, lobulated mass with early peripheral enhancing radiating lines and progressive enhancement of the angiomatous nodules; delayed enhancement of the fibrous tissue; and hypo-intense T2 signal intensity from hemosiderin deposition.

References
Case 9.
Genitourinary by Nam Kyung Lee

56/F, Gross hematuria

Fig. 1. Transabdominal ultrasound

Fig. 2. Nonenhanced CT

Fig. 3. Contrast-enhanced CT
Question
What is your diagnosis?

1) Transitional cell carcinoma
2) Lymphoma
3) Suburothelial hemorrhage
4) Ureteral tuberculosis
5) Ureteritis

Answer: 3) Suburothelial hemorrhage

Imaging features
Ultrasound shows hydronephrosis. Nonenhanced CT scans show hyperattenuated wall thickening of the right renal pelvis and upper ureter. On contrast-enhanced CT, hyperattenuated wall thickening in the renal pelvis and ureter shows no enhancement. This patient had been on warfarin after mitral valve replacement. International normalized ratio level was 2.06 (normal range: 0.88–1.12)

Discussion
Suburothelial hemorrhage is a rare condition with clinical presentation and imaging findings that may mimic a neoplasm of the renal collecting system. More recently, the association between Coumadin anticoagulant therapy and suburothelial hemorrhage has been established. Other bleeding diatheses, including hemophilia and factor V deficiency, have also been associated with this condition. On CT, suburothelial hemorrhage manifests as mural thickening of the renal pelvis and upper ureter that may compromise the lumen of the renal pelvis and ureter and cause calyceal dilatation. Suburothelial hemorrhage is best appreciated on unenhanced images, when the high density of the lesion is most conspicuous. Other conditions such as pyeloureteritis cystica, uroepithelial tumor, and vascular impressions from collateral circulation do not show high density. In patients with suburothelial hemorrhage, the hemorrhage tends to resolve rapidly once Coumadin is withdrawn and the coagulopathy had been corrected.

References
**Case 10.**

Pediatric by Jae-Yeon Hwang

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**Question**

A 3 days old male presented with non-projectile, bilious vomiting. What is your diagnosis?

1) Preduodenal portal vein
2) Ladd band
3) Annular pancreas
4) Duodenal atresia
5) Midgut volvulus

**Answer:** 3) Annular pancreas

**Imaging features and discussion**

Duodenal obstruction is usually caused by duodenal atresia, annular pancreas, and midgut volvulus. Less frequently, it may be secondary to duodenal web, Ladd bands, or preduodenal portal vein.

Annular pancreas is an anomalous band of pancreatic tissue that arises from the head of the pancreas and encircles the second portion of the duodenum. It is believed to result from the failure of normal pancreatic tissue to rotate around the duodenum. If a complete ring is formed, there may be total obstruction of the duodenum at the time of birth; if the ring is incomplete, obstruction may occur later in life or may never produce symptoms. Annular pancreas is frequently diagnosed in infancy because of associated duodenal obstruction. However, in approximately half the cases, the diagnosis is made beyond infancy.
At sonography, the annular pancreas appears as a circumferential band of echogenic tissue encircling a fluid-filled, dilated descending duodenum. MRI has advantages over CT in the diagnosis of annular pancreas, because with MRI it is easier to detect and characterize the tissue surrounding the duodenum as pancreatic. ERCP and MRCP are used to investigate ductal anatomy. Coincidence of congenital short and annular pancreas with gallbladder agenesis and splenic malrotation is rare.

References

57/M, Past history: CVA (30 years ago)

**Question**
What is your diagnosis?

1) Superior cerebellar artery infarct
2) Cerebellitis
3) Olivopontocerebellar atrophy
4) Crossed cerebellar diaschisis
5) Wallerian degeneration

**Answer**: 4) Crossed cerebellar diaschisis
Imaging features
1. Volume loss and hyperintensity in the left subcortical white matter on T2WI with multiple calcifications at left basal frontal and parietal area.
2. Volume loss of the right cerebellar hemisphere

Discussion
Crossed cerebellar diaschisis (CCD) refers to a depression of blood flow and metabolism affecting the cerebellar hemisphere occurring as a result of a contralateral focal, supra-tentorial lesion. Mechanism is thought to be interruption of cortico–ponto–cerebellar connections due to the infarct which then causes deafferentation and transneural metabolic depression of the contralateral cerebellar hemisphere.

References