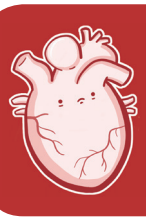

NOTES
VASCULAR COMPRESSION SYNDROMES

GENERALLY, WHAT ARE THEY?

PATHOLOGY & CAUSES

- Range of congenital/acquired anatomical compressions of vasculature/by vascular structure
- Acquired
  - Rapid changes in weight → changes to fat pad cushioning between vasculature, other structures → compression
- Vasculature squeezed between two structures → ischemia (artery)/vascular engorgement (vein)
- Vasculature compresses, obstructs another structure → obstruction

SIGNS & SYMPTOMS

- Vascular obstruction → ischemia
  - Pain, nausea, vomiting, weakness, cold, pulseless extremity
- Organ obstruction
  - Pain, nausea, vomiting, weight loss

DIAGNOSIS

DIAGNOSTIC IMAGING

- X-ray, CT scan, ultrasound

OTHER DIAGNOSTICS

- Physical exam

TREATMENT

SURGERY

- See individual disorders

OTHER INTERVENTIONS

- Weight gain/loss

NUTCRACKER SYNDROME

osms.it/nutcracker-syndrome

PATHOLOGY & CAUSES

- Left renal vein squeezed between superior mesenteric artery, abdominal aorta
- Three unpaired arteries
  - Celiac, superior mesenteric, inferior mesenteric
- Aortomesenteric angle
  - Between aorta, superior mesenteric artery
- Aortomesenteric angle reduced → arteries pinch left renal vein → prevents blood return to heart → blood backs up in left kidney → renal hypertension → small breaks in renal blood vessels → blood in urine
- Aortomesenteric angle may decrease to 6°
- Blood may back up in left testicle

CAUSES

- *Young people:* reduction of aortomesenteric angle due to normal growth
- *Adults:* extreme weight loss due to severe illness (e.g. HIV/AIDS, cancer, anorexia nervosa), compressing tumors (e.g. pancreatic)

COMPLICATIONS

- Varicocele
  - Left testicular vein drains into left renal vein → blood backs up into left testicle
- Ovarian vein syndrome
  - Dilated ovarian vein compresses ureter → abdominal/back/pelvic pain
- Renal vein thrombosis

SIGNS & SYMPTOMS

- Left flank pain
- Hematuria
- Nausea, vomiting (compression of splanchnic veins)
- Individuals who are biologically male
  - Scrotal mass → varicocele (engorgement of testicular veins)

DIAGNOSIS

DIAGNOSTIC IMAGING

Ultrasound, Doppler, CT scan, MRI, conventional angiography

- Left renal vein stenosis, reduced aortomesenteric angle
- Reduced blood flow through left renal vein on Doppler
- Collateral circulation
- Dilated testicular veins → varicocele

TREATMENT

SURGERY

- For tumors
  - Move vein, place stent

OTHER INTERVENTIONS

- Weight gain
  - Increase mesenteric fat pad → widen aortomesenteric angle → relieve compression

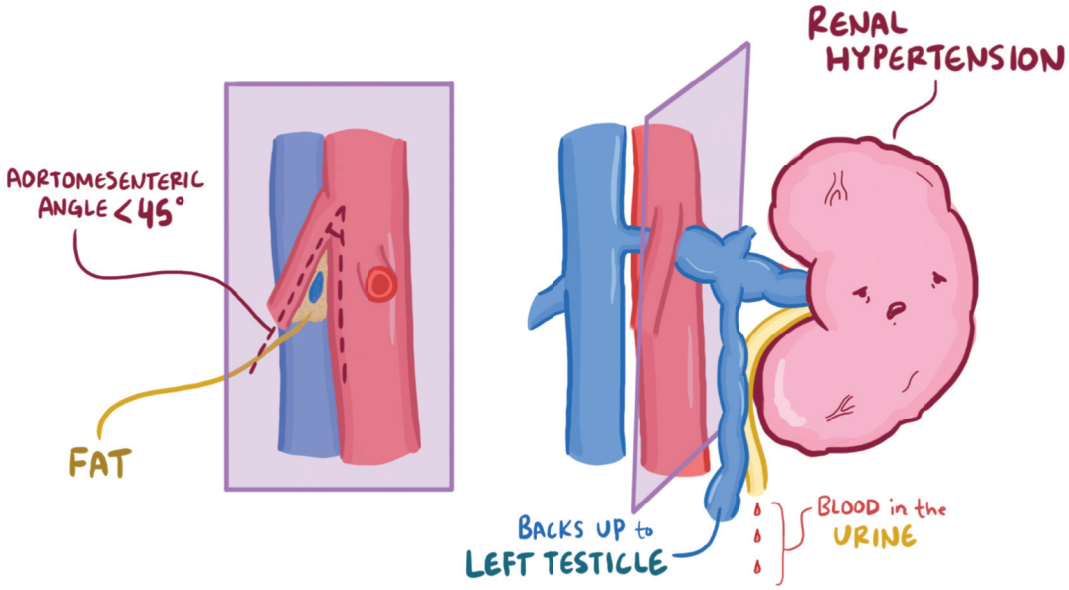

Figure 21.1 An illustration demonstrating the pathophysiology and sequelae of nutcracker syndrome.

SUPERIOR MESENTERIC ARTERY SYNDROME

osms.it/superior-mesenteric-artery-syndrome

PATHOLOGY & CAUSES

- Vascular structures compressing another structure
- Distal third of transverse section of duodenum compresses between abdominal aorta, superior mesenteric artery
- Three unpaired arteries
  - Celiac, superior mesenteric, inferior mesenteric
- Mesenteric fat pad thins out → reduces aortomesenteric angle → aorta, superior mesenteric artery pinch down on transverse duodenum → intestinal obstruction

CAUSES

- Extreme weight loss
  - Illness/intentional
- Post-scoliosis surgery
- Congenital anatomic abnormalities
  - Ligament of Treitz too short
  - Superior mesenteric artery branches off aorta further down

COMPLICATIONS

- Small bowel obstruction
- Severe malnutrition, wasting → increases compression, worsens condition

SIGNS & SYMPTOMS

- Gradual/quick onset; may be intermittent
- Early satiety; bilious emesis; weight loss; abdominal distention; burping; hypersensitive abdomen; reflux, heartburn
- Relieved when in left lateral decubitus (knee-to-chest) position/prone position; with Hayes maneuver (apply pressure below umbilicus towards head, spine)

DIAGNOSIS

DIAGNOSTIC IMAGING

Abdominal X-ray

- Dilated fluid/gas-filled stomach, proximal duodenum

CT scan with oral contrast/MRI

- Vascular compression of third part of duodenum, reduced aortomesenteric angle, collapsed small bowel distal to SMA crossing

Abdominal ultrasound

- Dilated proximal duodenum, stomach

OTHER DIAGNOSTICS

- High-pitched bowel sounds
- Succussion splash
  - Sloshing sound of built-up gas, fluid in distended digestive tract upstream of obstruction

TREATMENT

SURGERY

- E.g. ligament of Treitz → allow duodenum to move freely

OTHER INTERVENTIONS

- Management
  - Nasogastric tube to decompress stomach, early duodenum; fluids, electrolytes
- Weight gain (regrow mesenteric fat pad); may require feeding tube past obstruction

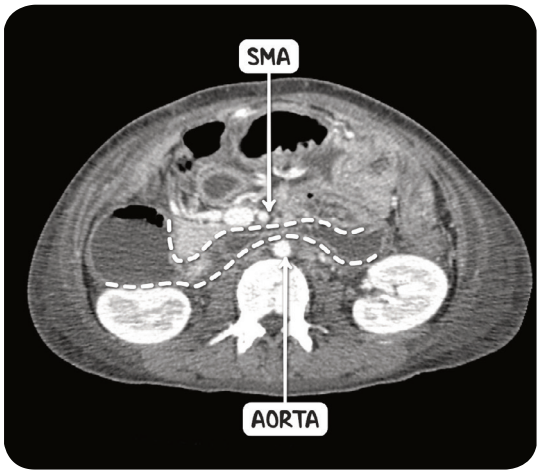

Figure 21.2 An abdominal CT scan in the axial plane demonstrating superior mesenteric artery compression syndrome. The third part of the duodenum (outlined) is compressed between the superior mesenteric artery and the aorta.