

Superior Mesenteric Artery (SMA) Syndrome

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Pathophysiology and Presentation

Also Known As

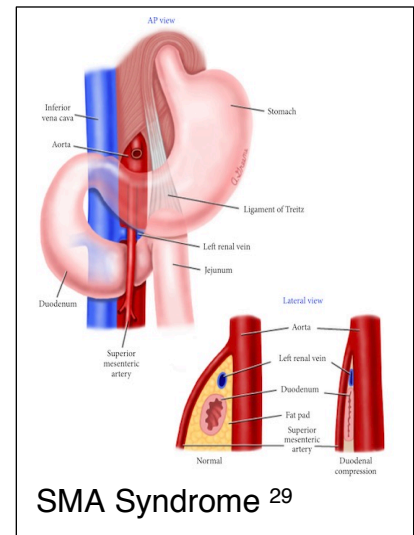
- *Wilkie Syndrome* ^{1,2}
- *Arteriomesenteric Duodenal Obstruction* ³
- *Chronic Duodenal Ileus/Stasis* ^{1,4}
- *Megaduodenum* ⁴
- *Cast Syndrome* – Specifically if Occurs After Corrective Surgery for Scoliosis ⁵

Pathophysiology

- Extrinsic Obstruction of the Third Portion of the Duodenum Between the SMA and Aorta
- Anatomic Features:
 - *Aortomesenteric Angle (AMA)*: Angle Between the SMA and Aorta (Normal: 38-65 Degrees) ^{6,7}
 - *Aortomesenteric Distance (AMD)*: Distance Between the SMA and Aorta (Normal: 10-28 mm) ^{7,8}
- A Sharp AMA and Decreased AMD Primarily Occurs from Loss of the Mesenteric Root Fat Pad – May Be Worsened in the Supine Position

Etiology

- **Profound Weight Loss** – Most Common Cause
 - Severe Illness (Cancer, AIDS, Burns, or Trauma) ⁸⁻¹⁰
 - Bariatric Surgery ¹¹⁻¹³
 - Paraplegia ¹⁴
 - Drug Abuse ¹⁵



- Anorexia ^{16,17}
- Pediatric Patients with Insufficient Weight Gain Relative to Height Growth ¹⁸
- Corrective Surgery for Scoliosis – Lengthens Spine and Displaces SMA ^{5,19,20}
- Other Surgeries Causing Weight Loss or Anatomic Changes (Esophagectomy, Colectomy, Appendectomy) ²¹⁻²³
- Abdominal Aortic Aneurysm (AAA) ²⁴
- Congenitally Short Ligament of Treitz (Rare) ^{25,26}

Presentation

- Nonspecific Signs of Proximal Small Bowel Obstruction ^{27,28}
 - Nausea and Vomiting (Bilious)
 - Esophageal Reflux
 - Postprandial Epigastric Abdominal Pain
 - Early Satiety
 - Weight Loss
 - Electrolyte Abnormalities
- Symptoms May be Relieved by Positioning to Decrease Compression ¹
 - Positions: Prone, Left Lateral Decubitus, or Knees-to-Chest

Diagnosis and Treatment

Diagnosis

- Generally a Diagnosis of Exclusion
- Radiographic Imaging: ²⁷
 - Upper GI Contrast Series (UGI)
 - Ultrasound (US)
 - CTA or MRA
- Imaging Findings:
 - Duodenum Dilation/Obstruction
 - Decreased Aortomesenteric Angle or Aortomesenteric Distance (AMA ≤ 25 Degrees is the Most Sensitive Measure for Diagnosis, Particularly if AMD is Also ≤ 8 mm) ^{30,31}



SMA Syndrome on CT ³⁶



SMA Syndrome on UGI – Obstruction at the Third Portion of the Duodenum ²⁹

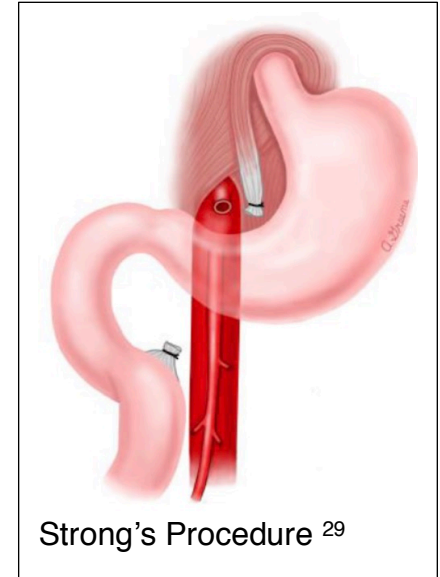
Medical Management

- Primary Treatment: Nutritional Support and High Calorie Diet ^{27,32}
 - May Require Nasojejunal (NJ) Tube Placed Beyond the Obstruction for Tube Feeding if Unable to Tolerate Oral Feeding
 - Enteral Nutrition is Preferred but TPN May Be Required
- Other Potential Treatment Requirements:
 - Correction of Electrolyte Abnormalities

- Nasogastric (NG) Tube Decompression for Significant Obstruction
- Psychologic Counseling – Many Are Associated with Underlying Psychologic Comorbidities (Drug Use, Anorexia, and Other Eating Disorders)
- Surgical Intervention Considered if Medical Management Fails

Surgical Options

- *Gastrojejunostomy*³³
 - Creates a Bypass Around the Obstruction
 - Does Not Relieve the Physical Obstruction – May Require a Second Procedure if Symptoms Persist
 - Risk for Bile Reflux Gastritis and Blind Loop Syndrome
- *Duodenojejunostomy*³⁴
 - Generally Accepted as Having **Superior Results to Other Surgical Options**³²
 - Can Be Done with or without Division of the Fourth Portion of the Duodenum
 - More Physiologic Than Gastrojejunostomy
 - More Technically Challenging
 - Risk for Blind Loop Syndrome if the Fourth Portion of the Duodenum is Not Divided
- *Strong's Procedure*³⁵
 - Procedure: Division of the Ligament of Treitz
 - Allows Mobilization of the Duodenum to Lay to the Right Side Away from the Aorta
 - Does Not Compromise Bowel Integrity or Require Any Anastomoses
- *Approaches Can Be Done Open or Minimally Invasive



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