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COMPLICATIONS OF MECKEL'S DIVERTICULITIS

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Meckel's diverticulum is a congenital anomaly found in 2% of the population. It is a remnant of the vitelline duct, which is usually located on the antimesenteric border of the ileum, within about 60 cm of the terminal ileum. As a congenital variant, Meckel's diverticula are often found in children and less commonly present in the adult population. It follows the "Rule of 2s" (occurring in 2% of the population, located 2 feet from the ileocecal valve, and typically 2 inches long), it is often asymptomatic. However, when complications arise – most notably diverticulitis – they present as surgical emergencies that challenge even experienced clinicians due to their ability to mimic other abdominal pathologies.

The inflammation of a Meckel's diverticulum – referred to as diverticulitis – typically occurs through three primary physiological pathways: luminal obstruction, ectopic tissue irritation, and mechanical torsion. The most frequent cause is luminal obstruction. Meckel's diverticulitis marks the beginning of a potentially dangerous clinical progression. The primary danger of this condition lies not just in the localized inflammation, but in the severe secondary complications that can arise if the condition is not diagnosed and surgically managed promptly. These complications include perforation, peritonitis, intestinal obstruction and hemorrhage.

Perforation and peritonitis are the most immediate and life-threatening complication of Meckel's diverticulitis. As the inflammatory process intensifies, the intraluminal pressure within the diverticulum increases, compromising the blood supply to the diverticular wall. This leads to ischemia and eventually transmural necrosis (tissue death). Once the wall loses its structural integrity, it ruptures, spilling fecal matter, digestive enzymes, and bacteria into the sterile peritoneal cavity. This results in acute peritonitis – a systemic inflammatory response characterized by rigid abdominal guarding, high fever, and potentially septic shock. Perforation is more common in Meckel's diverticulitis than in appendicitis due to the thinner walls of the diverticulum.

Intestinal obstruction in Meckel's diverticulitis is a frequent "lead point" for various forms of bowel obstruction. Inflammation causes the diverticulum to become swollen and rigid, which can trigger intussusception, a condition where the diverticulum is pulled into the downstream segment of the ileum, much like a folding telescope. Furthermore, many diverticula are attached to the umbilicus by a persistent fibrous band. An inflamed diverticulum can cause the small bowel to twist around this band, leading to a volvulus. Both scenarios result in a mechanical blockage that cuts off blood flow to the intestines, requiring emergency surgical intervention to prevent massive bowel infarction.

Gastrointestinal bleeding is common complication of a Meckel's diverticulum (usually due to ectopic gastric mucosa), it can complicate the course of diverticulitis. The presence of acid-secreting stomach tissue within an inflamed diverticulum can lead to deep peptic ulceration of the adjacent ileal wall. When these ulcers erode into small mesenteric arteries, significant hematochezia may occurs. In the context of active diverticulitis, the combination of infection and hemorrhage can rapidly deplete a patient's hemodynamic stability.

Abscess formation happens as a result of immune system attempts to "wall off" a micro-perforation of the diverticulum. This leads to the formation of an intra-abdominal abscess. While an abscess may temporarily prevent generalized peritonitis, it serves as a persistent reservoir of infection. These localized collections of pus can cause chronic pain, intermittent fevers, and can eventually fistula into other organs, such as the bladder or other loops of the small or large intestine.

Main treatment of mentioned above complications includes segmental ileal resection, that is typically preferred over a simple diverticulectomy to ensure the complete removal of all ectopic gastric tissue. Peritoneal lavage supported by intravenous antibiotics and fluid resuscitation should be added in case of peritonitis or abscess.