Superior Mesenteric Artery Syndrome with: Gastric Emphysema, Gas in the Portal Vein and Pneumoperitoneum Due to Anorexia Nervosa

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Case Report: A 12-year-old patient suffering from anorexia nervosa feeding implementation after a period of prolonged fasting cause a refeeding syndrome, which manifests itself as acute electrolyte deficiency resulting in dysfunction of the entire organism, including bowel transit time disorders. Gastric antral electrical dysrhythmas which develop in this mechanism promote dilatation of the stomach. Concomitant compression and obstruction of the third portion of the duodenum due to superior mesenteric artery syndrome (Superior Mesenteric Artery syndrome) results in stomach dilatation, which can lead to gastric emphysema and pneumoperitoneum. The pathomechanisms described above create a vicious circle mechanism general symptom in the young patient.

Conclusion: Gastric emphysema with gas in the portal vein and Superior mesenteric artery syndrome are potentially threatening complications of chronic malnutrition and anorexia.

Intensive conservative treatment with a control CT scan after 24 to 48 hours may be useful when making the decision to withdraw from surgical procedure.

Releasing the duodenum from the compression gives the opportunity to eliminate one element of the vicious circle mechanism as far as the treatment of eating disorders is concerned.

Keywords
Superior mesenteric artery syndrome; Gastric emphysema; Portal vein gas; Anorexia nervosa

Introduction
Medical symptoms associated with chronic malnutrition have long been observed. These include: superior mesenteric artery syndrome (Superior mesenteric artery syndrome), pneumatosis intestinalis (PI) as well as the refeeding syndrome symptoms. Superior mesenteric artery syndrome was first described by Rokitansky in 1861 with a frequency estimated at 0.3% of the population [1,2,3]. Symptoms of pneumatosis intestinalis have been reported by DuVeroni in 1754.

Discussion
Superior mesenteric artery syndrome is described as an exogenous compression of the third portion of the duodenum by narrowing of the angle between the abdominal aorta and the overlying superior mesenteric artery (<25°C). This pathology is caused by involution of retroperitoneal and mesenteric fat which is physiologically present in this area. Compression and obstruction of the third portion of the duodenum results in stomach dilatation, which can further lead to gastric emphysema. Massive distension of the stomach causes hypoperfusion and ischemia with gas penetration into the gastric wall [4,5]. Feeding implementation after a period of prolonged fasting cause a refeeding syndrome as well, which manifests itself as acute electrolytes deficiency resulting in dysfunction of the entire organism, including bowel transit time disorders [1,6]. Gastric antral electrical...
dysrhythmias which develop in this mechanism promote dilatation of the stomach and lead to further consequences described previously.

Treatment of superior mesenteric artery syndrome may be conservative or surgical. The latter is connected with releasing the third portion of the duodenum by performing a duodeno-jejunal bypass anastomosis above the superior mesenteric artery (also known as Strong’s procedure) [2,5,7]. Norris proves that 73% patients suffering from anorexia-related superior mesenteric artery syndrome can be successfully treated conservatively [8]. In this presented case, the decision of surgical intervention was made not strictly because of the superior mesenteric artery syndrome but due to the presence of concomitant symptoms such as pneumoperitoneum and the co-occurrence of PVG with PI which could cause possible further serious consequences. Sooby quotes a 44% mortality rate due to the presence of PI and a 2% mortality rate for idiopathic PVG. However, the co-occurrence of PVG with PI increases the mortality rate up to 75-90% [9]. Additionally, the presence of free gas in the peritoneal cavity, which suggested a gastrointestinal tract perforation, determined the decision of surgical intervention (as statistical data presents an 80% mortality rate in patients suffering from anorexia [8]. Mularski quotes that the rupture of the intramural emphysematous bulla (which creates PI) is not synonymous with a full thickness gastrointestinal wall perforation, as the majority of emphysematous bullas are located in the submucosal or subserosal layers of the bowel and they do not communicate with its lumen [9,10].

When analyzing the presented case report and the literature data, intensive conservative treatment (as well as monitoring the patient with a control CT scan of the abdominal cavity after 24-48 hour) provides a tempting alternative to urgent surgical treatment. The presented patient is one of the youngest patients suffering from anorexia (12 years old) with such severe general symptoms. Norris quotes 12 patients under 18 years of age, in whom, in course of anorexia, gastric complications have been observed [8]. However none of the patients have presented gastric PI, nor gas in the portal vein or pneumoperitoneum.

Conclusion

- Gastric emphysema with gas in the portal vein and superior mesenteric artery syndrome are potentially threatening complications of anorexia and chronic malnutrition.
- Despite distressful radiological signs, an intensive conservative treatment with a control CT scan after 24-48 hours may be useful when making the decision to withdraw from surgical procedure.
- Releasing the duodenum from the compression gives the opportunity to eliminate one element of the “vicious circle” mechanism as far as the treatment of eating disorders is concerned.

Conflict of Interest

The authors have no disclosures of funding or financial support to disclose with regards to the preparation of this manuscript. Additional informed consent was obtained from participant for whom identifying information is included in this article.

References


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