



Perplexing findings during laparoscopic evaluation for tubal factor infertility resulting from a gastric leak after bariatric surgery: A case report

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ABSTRACT

Tubal factor is the primary type of female infertility, accounting for 25–35% of cases. Common causes include inflammation due to pelvic inflammatory disease, septic abortion, tubal surgery, and surgical adhesions. Bariatric surgery is becoming increasingly popular as rates of obesity rise, with over 256,000 surgeries performed in 2019. Half of these procedures were performed on women of reproductive age. This is the first reported case of a patient with tubal factor infertility as a result of a gastric leak from a remote sleeve gastrectomy that led to extensive abdominal and pelvic adhesions.

1. Introduction

Infertility is the inability of a couple to achieve pregnancy after one year of unprotected intercourse. According to the World Health Organization (WHO), the worldwide prevalence of infertility is 15%. It is a devastating condition for families and can have significant psychosocial impacts on affected individuals. Tubal factor is the primary type of female infertility, accounting for 25–35% of cases. Common causes of tubal factor infertility include pelvic inflammatory disease (PID), septic abortion, ruptured appendix, tubal surgery, and ectopic pregnancy [1]. Other causes include inflammation related to endometriosis, inflammatory bowel disease, and, notably, surgical adhesions [2]. Surgical adhesions result from over 50% of all abdominal operations, including bariatric surgery [3].

According to the US National Center for Health Statistics, in 2018, 39.7% of women of reproductive age were classified as obese [4]. Obesity has well-studied medical complications, including hypertension, type II diabetes, hyperlipidemia, coronary artery disease, stroke, cancer, gallbladder disease, obstructive sleep apnea, osteoarthritis, and psychiatric disorders. While lifestyle modifications remain the first-line treatment for obesity, bariatric surgery is becoming an increasingly popular second-line treatment for patients refractory to lifestyle optimization or medical management, and/or with significant medical comorbidities. In 2019, over 256,000 bariatric surgeries were performed, 80% on women [5–7]. Patients are often co-managed by bariatric surgeons and nutritionists to evaluate and treat for potential

nutritional deficiencies, and attempts at conception are often postponed for 12–24 months [6]. As weight loss is part of fertility optimization, it is likely that there will be an increasing number of patients presenting with infertility and a history of bariatric surgery. Moreover, obstetricians should expect an increase in the number of postoperative complications from these surgeries as potential contributors to infertility. This is the first reported case of tubal infertility as a result of remote unrecognized gastric leak following sleeve gastrectomy. Diffuse abdominopelvic adhesions and intraoperative findings further confounded the patient's presentation.

2. Case Presentation

A 28-year-old woman, G0, with a one-year history of primary infertility, polycystic ovarian syndrome (PCOS), and class I obesity presented to an academic reproductive endocrinology clinic for evaluation. She had been diagnosed with PCOS using Rotterdam criteria, with anovulation and hyperandrogenism. Her history was remarkable for a sleeve gastrectomy two years prior and an abdominal hernia repair. Her body mass index (BMI) was 34.9 kg/m². Her infertility evaluation included anti-mullerian hormone (AMH) 12.9 ng/ml, hemoglobin A1c 5.5%, total testosterone 66 ng/dl, normal prolactin, and normal thyroid studies. A saline infusion sonogram (SIS) demonstrated polycystic-appearing ovaries, a thickened endometrium, and a right hydrosalpinx.

Diagnostic laparoscopy and hysteroscopy were performed. On hysteroscopic assessment, diffuse polypoid tissue was removed through

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sharp curettage. Upon entering the abdomen laparoscopically, dense abdominopelvic adhesions were noted (Photos 1–2). Extensive lysis of adhesions was performed. Numerous nodules, 1–3 cm in diameter, were found throughout the pelvis and abdomen (Photos 3–5). An intra-operative gynecologic oncology consultation was obtained with the recommendation to obtain multiple biopsies and to discontinue the laparoscopy and await a final pathologic diagnosis. The biopsied samples were reviewed by multiple pathologists before the final report was issued of foreign material compatible with vegetable matter, and benign fibroconnective, heterotopic bone tissue. The pathologic evaluation of endometrial curettage was consistent with an endometrial polyp. With these pathologic findings, the treatment plan was to perform a laparoscopic salpingectomy and then proceed with in-vitro fertilization. Unfortunately, due to financial constraints, the patient did not elect to proceed with this treatment.

3. Discussion

This case is a novel presentation of tubal factor infertility in a patient with an undiagnosed gastric leak from a remote gastric sleeve procedure. The American College of Obstetrics and Gynecology (ACOG) reports steeply rising rates of obesity and half of all bariatric procedures being performed on women of reproductive age. Increasing numbers of adolescents are undergoing bariatric surgery, though its appropriateness and efficacy for this age group have not been determined. Additionally, bariatric surgery has been identified as a potential second-line treatment for PCOS when morbid obesity and anovulation are resistant to lifestyle intervention [6]. As weight loss is a significant component of fertility optimization, it is likely that more patients will be presenting to infertility clinics with a history of bariatric surgery. Therefore, obstetrics, gynecology, and reproductive endocrinologists need to be aware of the acute and delayed complications of bariatric surgery which could potentially present as infertility.

There are many different types of bariatric surgeries, including Roux-en-Y gastric bypass (RYGB), sleeve gastrectomy, laparoscopic adjustable gastric banding (LAGB), and vertical banded gastroplasty (VBG). It is important to understand the potential surgical complications of these procedures. Gastric sleeve surgery is the most common, comprising 59% of bariatric surgeries [5]. The major complications of gastric sleeve surgeries include sleeve stenosis, gastric leaks, and esophageal pathology. Gastric leak is a serious complication of gastric sleeve procedures, affecting up to 5.3% of patients. Patients can be asymptomatic or they can present with mild symptoms such as nausea, vomiting, and abdominal pain. However, patients often present with acute peritonitis, abscesses, fistulas, sepsis, or organ failure, and deaths are also reported [7,8]. Since the symptoms of gastric leak can have delayed presentation, patients with tachycardia, elevated c-reactive protein, or leukocytosis require further evaluation. In this patient, an unrecognized gastric leak is the most likely cause of the diffuse intraperitoneal lesions containing food material and of the extensive abdominal and pelvic adhesions resulting in tubal factor infertility.

Complications from the other bariatric procedures (RYGB, LAGB, VBG) will present similarly and often with nausea, vomiting, epigastric pain and/or gastrointestinal bleeding. The complications of Roux-en-Y gastric bypass surgery include anastomotic ulcerations, stenosis, gastro-gastric fistulas, surgical leaks, intestinal obstruction, cholelithiasis, and dilated gastrojejunal anastomosis [9]. The LAGB complications are more frequently delayed and include reflux esophagitis, esophageal dilation, band erosion, and band slippage. The VBG complications include anastomotic stenosis, staple line dehiscence, and/or band erosion [9,10].

Though these complications are serious, they may be asymptomatic. There is the potential for the development of severe adhesions in the pelvis involving the uterus, fallopian tubes, and ovary. This may result in tubal scarring, hydrosalpinx, or tubal occlusion presenting as tubal factor infertility. While many patients with tubal factor infertility will

proceed with in vitro fertilization, patients requiring advanced evaluation with diagnostic and operative laparoscopies may have significant pelvic adhesions which could explain altered tubal function. It is important for pelvic surgeons to be aware of the unique sequelae of potential complications of gastric sleeve bariatric surgery as they may point to the etiology of infertility in patients with tubal pathology.

Contributors

Alexandra M. Poch, the primary author, was involved in drafting the initial manuscript, editing, and approved the final submission.

Michael Dougherty was involved in the revision of the manuscript and approved the final submission.

Robert A. Roman was involved in the revision of the manuscript and approved the final submission.

Larisa Gavrilova-Jordan was the attending physician involved in the patient care, revised the manuscript, and approved the final submission.

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Patient consent

Obtained. The patient consented to the publication of this case report.

Provenance and peer review

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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Appendix A. Supplementary data

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