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CASE REPORT

Refractory Hyperemesis Gravidarum in a Patient with Type 1 Diabetes Treated with Laparoscopically Assisted Feeding Jejunostomy Tube Placement

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Abstract

Background: Severe Hyperemesis gravidarum (HG) is a debilitating condition that affects less than 1% of pregnant women. Management of HG is further complicated in women with type 1 diabetes due to oscillations between hypo and hyperglycemia, often exacerbated by the presence of gastroparesis.

Case report: We report a 25-year-old G1P0 with longstanding uncontrolled type 1 diabetes mellitus (HbA1C 10.5%), who presented to our service multiple times with hyperemesis and ketosis. On each of these admissions, she was diagnosed with starvation ketosis due to inability to tolerate any oral intake since the start of pregnancy. Stepwise approach for management of HG with presumed gastroparesis was followed, starting with optimization of glucose control with multi-dose insulin, attempts at dietary modification, intravenous hydration, and pharmacologic therapy with prokinetics and antiemetics. Total parenteral nutrition (TPN) became necessary as she was unable to tolerate any oral intake and continued to experience weight loss.

With no improvement in the patient's condition and due to concerns related to long-term TPN, the option of a Feeding jejunostomy (FJ) was discussed with a multidisciplinary team consisting of the gastroenterology, nutrition, MFM, and general surgery services. At 23w0d, the patient underwent uncomplicated laparoscopically assisted J-tube placement, and enteral feedings were slowly advanced to goal and TPN was discontinued. Tube dislodgement was experienced on one occasion and was easily replaced. Obstruction of the J-tube was a recurrent difficulty but was easily manageable by the patient. The patient was able to be discharged home and continued managing the FJ until deliveryof a healthy female infantat 33w2d. Gastric function improved dramatically postpartum allowing for removal of the J-tube.

Conclusion

Enteral nutrition via J-tube proved to be a safe and effective option to treat intractable HG complicated by diabetic gastroparesis. Most complications were minor and were managed with simple measures. FJ should be considered as a viable option for treating women with gastroparesis presenting with intractable HG.

Introduction

Gastroparesis is a complication of longstanding Diabetes Mellitus characterized by delayed gastric emptying. Symptoms can be exacerbated by the reduction in gastric contractility from progesterone during pregnancy. Traditionally diabetic gastroparesis has been considered a contraindication to pregnancy due to its potential risks to the life of the mother and her fetus, especially when presenting with hyperemesis gravidarum [1]. Management can be difficult and there are limited reports describing surgical treatment for refractory gastroparesis in the pregnant population [2,3].

Case Presentation

This report describes the case of a 25 y/o G1P0 with Type I diabetes mellitus (T1DM) who initially presented at 10w1d by first trimester ultrasound with an unplanned but desired pregnancy. The patient was diagnosed with T1DM at age 12 after presenting with polyuria and polydipsia. She had a history of poorly controlled diabetes complicated by peripheral

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Table 1: Prepregnancy and pregnancy weight.

Prepregnancy weight	Weight at initial prenatal visit at 10w1d	Weight on admission at 17w0d	Weight at start of TPN	Weight at start of J-tube feedings	Weight at time of delivery at 33w2
118 lbs	95 lbs	95 lbs	96 lbs	98 lbs	113 lbs

neuropathy and had several admissions for Diabetic ketoacidosis (DKA) within the previous year. She was previously treated with an insulin pump but was dissatisfied and transitioned to multiple subcutaneous insulin injections. HbA1c at her first prenatal visit was 10.5%. The patient had no additional medical or surgical history. Social history consisted of marijuana use, however the patient reported that she had discontinued use once she discovered she was pregnant. At her first prenatal visit she was transitioned to insulin Detemir 12 U BID and Aspart boluses before meals at a ratio of 1 u/10 gm carbohydrates.

By 17 weeks of gestation, the patient had experienced 4 hospital admissions for treatment of hyperemesis and starvation ketosis, together with complaints of unrelenting epigastric pain (6w4d, 13w3d, 15w5d, 17w0d). Her admission at 17w0d was prolonged for 11 weeks due to severe Hyperemesis gravidarum (HG) with unremitting nausea and vomiting (N/V), abdominal pain, weight loss (23lbs from prepregnancy weight), and malnutrition. See Table 1 for trend of patient's weight. These continued despite treatment with pharmacologic agents that included stepwise use of vitamin B6, doxylamine, metoclopramide, ondansetron, famotidine, diphenhydramine, erythromycin, lorazepam, prochlorperazine, chlorpromazine, and dicyclomine for abdominal cramping. Multidisciplinary discussions were convened with the gastroenterology, endocrinology, psychiatry, social work, nutrition, general surgery, and MFM teams to discuss options for the management of her refractory N/V. It was assumed that her hyperemesis was likely exacerbated by gastroparesis from her longstanding diabetes. Nasogastric tube (NGT) placement was attempted to assist with gastric decompression but was almost immediately removed due to patient intolerance. Severe persistent symptoms despite medical management subsequently required total Parenteral nutrition (TPN) via a Peripherally inserted central catheter (PICC) line that stayed in place for 35 days. Recognizing the potential for severe complications related to prolonged TPN, the option of placing a feeding jejunostomy that would bypass the stomach was considered. At 23 weeks gestation, the patient underwent laparoscopically assisted placement of a feeding jejunostomy tube under general anesthesia. Tube feeding was initiated and was well tolerated by the patient and TPN was discontinued. The patient was eventually discharged home at 27w6d tolerating small orals feeds with the jejunostomy tube in place, on tube feeds via pump at a rate of 90 cc/hour and with home nursing care. The patient was instructed to flush the tube every 3 hours and before/after disconnecting the feeding bag as it had been intermittently clogging. Outpatient follow up with gastroenterology, general surgery, and maternal fetal medicine services was arranged.

The patient was readmitted at 31w6d for evaluation after the tube had partially dislodged. At this time patient was evaluated by the general surgery team, who was able to advance tube along tract and secure it back in place. She was discharged and admitted again at 32w5d with N/V, fatigue, hyperglycemia, and new onset of severe hypertension (160 s/90 s; baseline 100-110/60-80 s). The patient was diagnosed with gestational hypertension with severe features, was given a course of steroids for fetal lung maturation, was started on magnesium sulfate for prevention of eclampsia, and was delivered by cesarean section at 33w2d. A vigorous female infant was delivered with Apgar of 7 at one minute and 8 at 5 minutes. The jejunostomy tube was removed 4 days post-delivery when the patient was tolerating oral intake and she was discharged on postoperative day 5 with excellent glycemic control. The patient had an uncomplicated postpartum course and established care with a new endocrinologist while continuing to be followed by gastroenterology.

Discussion

N/V is a common condition in pregnancy affecting approximately 70% of women worldwide. Severe N/V, however, usually described as hyperemesis gravidarum, is a debilitating condition that affects less than 1% of pregnant women [4]. This case illustrates how severe hyperemesis of pregnancy is further complicated by T1DM and diabetic gastroparesis, becoming a life-threatening condition. Successful treatment was achieved with laparoscopically assisted J-tube placement, which has been used for refractory diabetic gastroparesis; there are, however, few data describing this mode of therapy in pregnancy.

A past medical history of N/V predating pregnancy, as well as associated symptoms and findings on physical exam are crucial in differentiating the possible etiologies of N/V of pregnancy.

HG typically manifests before 9 weeks of gestation and patients rarely experience fever or abdominal pain beyond mild epigastric discomfort. At least 5% of prepregnancy weight loss is commonly used to define cases of HG, but patients will occasionally have considerably more weight loss and ketonuria, as well as electrolyte, thyroid, and liver abnormalities. Conversely, if a patient reports a history of thyroid disease or has findings consistent with Graves' disease (goiter), thyroid disease

should be suspected [5,6].

Other possible etiologies of N/V in pregnancy include gastrointestinal conditions, conditions of the genitourinary tract, metabolic, neurologic, psychologic conditions, or drug toxicity [7].

These conditions, as well as an eating disorder, such as anorexia and bulimia were ruled out in this patient. The patient had a history of cannabis use, raising the possibility of cannabis related hyperemesis or Cyclic vomiting syndrome (CVS). Cannabis related hyperemesis was first described in a case series from Adelaide, Australia, by Allen, et al., who identified 19 chronic cannabis users with N/V associated with marijuana use [5]. These patients displayed compulsive patterns of bathing with hot water that relieved their symptoms and N/V resolved when cannabis use was stopped [8]. CVS is characterized by incapacitating N/V interspersed with relatively symptom-free intervals lasting from a few days to several months. A history of seeking relief with hot showers is also common. Cannabis withdrawal has been proposed as the cause of these symptoms but with persistence of N/V beyond 2 weeks of abstinence, further workup in search of a different etiology is recommended [9]. Our patient did indeed engage in repetitive hot water bathing, but all urine drug screens during the course of her antenatal care were negative.

Early in the history, it is important to identify red flags. Our patient had a history of longstanding diabetes with poor glycemic control and peripheral neuropathy, raising the possibility of diabetic gastroparesis as a significant contributing factor to her symptoms, despite the absence of a clear antenatal diagnosis of gastroparesis. N/V, bloating, and upper abdominal pain resulting from delayed gastric emptying characterize this syndrome, which can be present in up to 5% of people with T1DM [10]. The pathophysiology underlying diabetic gastroparesis is not clearly defined but is likely multifactorial involving impaired function of the vagal nerve, abnormal myenteric neurotransmission, disturbances in the nitric oxygen regulation and loss of upregulation of the haeme-oxygenase 1 pathway, with resultant increased levels of reactive oxygen species. These are responsible for the loss of the interstitial cells of Cajal, the pacemakers of the intestine [11].

DKA symptoms can mimic the clinical presentation of gastroparesis with nonspecific symptoms of N/V, and abdominal pain [12,13]. By the same token, acute starvation ketosis, with ketonuria, anion gap metabolic acidosis, and electrolyte abnormalities can occur due to the inability to tolerate oral intake in severe gastroparesis, which again can create confusion when trying to differentiate starvation ketosis from an episode of DKA [14]. High levels of glucose are usually expected in DKA, althougheven modest glucose elevations can precipitate DKA in pregnant patients, further challenging the diagnosis [15]. Cause and effect relationship was difficult to establish in this case, but clinical impression was that N/V preceded and precipitated poor glucose control on most occasions. Our patient presented several times with ketosis, but in each instance the cause was determined to be starvation ketosis, and DKA was ruled out.

Regardless of the contributing factors to our patient's condition, a stepwise approach for the management of N/V was followed, starting with optimization of glucose control, dietary modification, hydration, and pharmacologic therapy with prokinetics and antiemetics [11].

Dietary modification included small and frequent meals throughout the day with foods low in fat and nondigestible fiber and the addition of nutritional shakes [11]. In addition, our patient was advised to elevate the head of the bed while eating to facilitate gastric emptying. Micronutrient deficiencies were treated with iron infusions and intravenous administration of vitamins and minerals.

Several prokinetics were used. These included metoclopramide, a dopamine agonist that is considered first-line therapy for gastroparesis due to its mechanism of action that includes enhancing gastric antral contractions and decreasing postprandial fundal relaxation [16]. Erythromycin, a macrolide with motilin agonist properties [17] was used as well. Doperidone (dopamine 2 antagonist) and cisapride (5HT4 agonist), have also been described in patients that fail to improve on metoclopramide, however these medications are not readily available in the United States [18].

Management with antiemetics is based on their efficacy in controlling nonspecific N/V [10]. We treated our patient with diphenhydramine, ondansetron, chlorpromazine, and prochlorperazine with attention to avoid polypharmacy to limit potential drug interactions and side effects. Unfortunately, symptoms continued despite pharmacologic therapy.

Placement of a NGT was attempted during an episode of severe N/V and abdominal pain as a temporary measure to allow decompression of the upper gastrointestinal tract, however patient was not able to tolerate the tube and it was removed.

TPN became necessary as our patient was unable to tolerate any oral intake and she continued to experience weight loss. The morbidity associated with long-term TPN (venous thrombosis, catheter related infections) prompted us to seek an alternative means of nutrition for this patient during the remaining months of her pregnancy [19].

Surgery is rarely indicated in pregnant patients with hyperemesis and/or gastroparesis and is used only as a last resort, as general anesthesia and surgery in pregnancy pose risks to both the mother and fetus. In this

case,after a multidisciplinary discussion, it was deemed necessary to proceed with surgical intervention, as none of the non-surgical approaches proved successful and the patient continued to be severely debilitated and in pain and continued to lose weight. Following surgery, enteral feedings were slowly advanced to goal and TPN was discontinued, providing good nutritional support as evidenced by weight gain, improvement of weakness, achievement of fluid and electrolyte balance, and resolution of abdominal pain, allowing her to be discharged from the hospital and continue outpatient follow-up with minimal tube-related complications.

Other surgical options have been described including Per-endoscopic jejunostomy (PEJ), that is more technically challenging and per-endoscopic gastrotomy with Jejunal extension (PEG-J), an intervention that is plagued by the difficulties caused by ongoing vomiting and gastric coiling [20].

A prior case report described the successful placement of a percutaneous endoscopic jejunostomy in a pregnant patient with gastroparesis secondary to T1DM and proposed this as a more secure alternative to percutaneous gastrojejunostomy in those patients in whom intragastric feeding is contraindicated [2]. This procedure, however, has lower rates of successful placement because it requires deep bowel endoscopy, expertise that is not always accessible.

Other institutions have described the use of a surgically placed feeding jejunostomy tube through an epigastric midline incision in women with refractory HG. All pregnancies (N = 5) in a published case series resulted in term deliveries of healthy neonates [3]. It is possible that laparoscopically assisted jejunostomy tube placement, such as in our case, offers patients the benefits of a minimally invasive approach, including less postoperative pain and faster recovery.

Conclusion

Enteral nutrition via J-tube proved to be a safe and effective option to treat intractable HG complicated by diabetic gastroparesis and should be considered as a viable option for treating these women.

References

1. Hawthorne G (2011) Maternal complications in diabetic pregnancy. Best Pract Res Clin Obstet Gynaecol 25: 77-90.
2. Rupani SV, Ergen WF, Weber F, Peter S (2018) Direct percutaneous endoscopic jejunostomy for the management of gastroparesis in pregnancy. Obstet Gynecol 131: 871-874.
3. Saha S, Loranger D, Pricolo V, Degli-Esposti S (2009) Feeding jejunostomy for the treatment of severe hyperemesis gravidarum: A case series. JPEN J Parenter Enteral Nutr 33: 529-534.
4. Einarson TR, Piwko C, Koren G (2013) Quantifying the global rates of nausea and vomiting of pregnancy: A meta analysis. J Popul Ther Clin Pharmacol 20: 171-183.
5. Goodwin TM (2008) Hyperemesis gravidarum. Obstet Gynecol Clin North Am 35: 401-417.
6. Koot MH, Boelig RC, Van't Hooft J, Limpens J, Roseboom TJ, et al. (2018) Variation in hyperemesis gravidarum definition and outcome reporting in randomised clinical trials: a systematic review. BJOG 125: 1514-1521.
7. (2018) ACOG Practice Bulletin No. 189: Nausea And Vomiting Of Pregnancy. Obstet Gynecol 131: 15-30.
8. JH Allen, GM de Moore, R Heddle, JC Twartz (2001) Cannabinoid hyperemesis: Cyclical hyperemesis in association with chronic cannabis abuse. Gut 53: 1566-1570.
9. Mithun B Pattathan, Reza A Hejazi, Richard W McCallum (2012) Association of marijuana use and cyclic vomiting syndrome. Pharmaceuticals (Basel) 5: 719-726.
10. Camilleri M, Parkman HP, Shafi MA, Abell TL, Gerson L, et al. (2013) Clinical guideline: Management of gastroparesis. Am J Gastroenterol 108: 18-37.
11. Tang DM, Friedenberg FK (2011) Gastroparesis: Approach, diagnostic evaluation, and management. Dis Mon 57: 74-101.
12. Carroll MA, Yeomans ER (2005) Diabetic ketoacidosis in pregnancy. Crit Care Med 33: 347-353.
13. Sibai BM, Viteri OA (2014) Diabetic ketoacidosis in pregnancy. Obstet Gynecol 123: 167-178.
14. Keay S, Fox R (2000) Maternal ketoacidosis complicating acute starvation in pregnancy. J Obstet Gynaecol 20: 539.
15. Modi A, Agrawal A, Morgan F (2017) Euglycemic diabetic ketoacidosis: A review. Curr Diabetes Rev 13: 315-321.
16. Shakhatreh M, Jehangir A, Malik Z, Parkman HP (2019) Metoclopramide for the treatment of diabetic gastroparesis. Expert Rev Gastroenterol Hepatol 13: 711-721.
17. Prather CM, Camilleri M, Thomforde GM, Forstrom LA, Zinsmeister AR (1993) Gastric axial forces in experimentally delayed and accelerated gastric emptying. Am J Physiol 264: 928-934.
18. Enweluzo C, Aziz F (2013) Gastroparesis: A review of current and emerging treatment options. Clin Exp Gastroenterol 6: 161-165.
19. Koretz RL, Lipman TO, Klein S, American Gastroenterological Association (2001) AGA technical review on parenteral nutrition. Gastroenterology 121: 970-1001.
20. Sarosiek I, Davis B, Eichler E, McCallum RW (2015) Surgical approaches to treatment of gastroparesis: Gastric electrical stimulation, pyloroplasty, total gastrectomy and enteral feeding tubes. Gastroenterol Clin North Am 44: 151-167.