



Case report

Penetration of the gastric band through the gastric wall during pregnancy: A rare case report

Gabija Didziokaite^{a,b,*}, Tomas Poskus^c, Laura Malakauskiene^d, Diana Ramasauskaite^b

^a Faculty of Medicine, Vilnius University, M. K. Ciurlionio g. 21, 03101 Vilnius, Lithuania

^b Institute of Clinical Medicine, Faculty of Medicine, Vilnius University Clinic of Obstetrics and Gynaecology, Vilnius University Hospital Santaros Clinics, Santariskiu g. 2, 08661 Vilnius, Lithuania

^c Center of Abdominal Surgery, Faculty of Medicine, Vilnius University, Santariskiu g. 2, 08661 Vilnius, Lithuania

^d Faculty of Medicine, Medical Academy, Lithuanian University of Health Sciences, A. Mickeviciaus g. 9, 44307 Kaunas, Lithuania

ARTICLE INFO

Keywords:

Gastric band penetration
Conservative treatment
Pregnancy
LAGB
Bariatric surgery
Case report

ABSTRACT

Introduction and importance: Obesity is a major health problem. Obese women have an increased risk of pregnancy-related complications. Weight loss before conception is associated with improved fertility rates and pregnancy outcomes. Bariatric surgery (BS), such as laparoscopic adjustable gastric banding (LAGB), was a popular option for obese women planning pregnancy. However, long-term follow-up studies indicate high rate of failure and reoperations.

The work has been reported in line with the SCARE 2020 criteria.

Case presentation: We present a case of a 41-years-old multigravida who was diagnosed with intragastric penetration of the gastric band on the 27th week. Diagnostic laparoscopy and intraoperative esophagogastroduodenoscopy were performed. Gastric band was not removed and no other surgical interventions were performed. The patient underwent a caesarean section on the 37th week, due to the remaining risk of repeated gastric-band-related complications.

Clinical discussion: The management of pregnancy following LAGB has not been well defined yet. Gastric band erosion with intragastric band migration is considered to be one of the most worrisome of all LAGB-related complications.

Conclusion: International treatment consensus for pregnancy after BS is still missing. This case illustrates a need for practitioner to maintain a high index of suspicion of gastric-band-related complications during pregnancy. Gastric-band-related complications during pregnancy are rare with only limited number of published reports. To our knowledge, this is the first reported intragastric penetration of the gastric band in a pregnant woman, which was managed without gastric band removal during pregnancy and which had a good outcome for both, the patient and her baby.

1. Introduction

The World Health Organization estimates that in 2018, 39% of adults worldwide were overweight and 13% were obese [1]. There is a strong correlation between obesity and an increased risk of gestational diabetes, macrosomia, gestational hypertension, preeclampsia, spontaneous miscarriage, higher rate of caesarean section and even fetal (neurological and cardiovascular) malformations [1–3]. Additionally, later in life their children are more likely to develop diabetes,

hypertension or cardiovascular disease due to epigenetic changes [1,3].

Weight loss before conception, on the other hand, is associated with improved fertility rates and pregnancy outcomes [1,4]. While lifestyle modification and medical therapy have limited success in maintaining long-term weight loss, bariatric surgery (BS) has become a popular alternative for obese women planning pregnancy [4].

Laparoscopic adjustable gastric banding (LAGB) was one of the most popular procedures for the treatment of morbid obesity in the world, accounting for about 42.3% of all bariatric interventions. By 2016 the

Abbreviations: LAGB, laparoscopic adjustable gastric banding; BMI, body mass index; BS, bariatric surgery; CRP, C-reactive protein; ICU, intensive care unit.

* Corresponding author at: M. K. Ciurlionio g. 21, 03101 Vilnius, Lithuania.

E-mail addresses: didziokaite.gabija@gmail.com (G. Didziokaite), Tomas.Poskus@santa.lt (T. Poskus), laura.malakauskiene@ismuni.lt (L. Malakauskiene), Diana.Ramasauskaite@santa.lt (D. Ramasauskaite).

<https://doi.org/10.1016/j.ijscr.2021.106640>

Received 1 October 2021; Received in revised form 22 November 2021; Accepted 28 November 2021

Available online 30 November 2021

2210-2612/© 2021 Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

LAGB use had decreased significantly and currently represents about 3.0% of all bariatric operations [5]. Long-term follow-up studies indicate a high rate of failure and reoperations, therefore band erosion, band leak, esophageal dilatation, port of catheter leak, port infection were the most common causes of gastric band removal. In general, about 30–50% of patients will need repeated operation to address the problem with their band [5]. Complications during pregnancy occur in about 5% of the cases and mostly include vomiting, gastric prolapse, stomal obstruction, gastric erosion and necrosis [6]. One of the main factors that contribute to the complications and especially to band slippage is the increased intra-abdominal pressure and frequent vomiting during pregnancy [2].

2. Presentation of case

A 41 year old woman at 27th week of gestation was admitted in compulsive supine position with acute “stabbing” upper abdominal pain, radiating to the scapula. The pain started two days ago and became more intensive 11 h before the admission. There was no vomiting, reflux or dysphagia and the patient reported normal bowel habits. Patient's weight on admission was 70 kg with body mass index (BMI) of 26,35 kg/m² as the patient has gained 2 kg during this pregnancy (BMI before conception was 25,6 kg/m²). She had laparoscopic gastric band insertion 13 years prior.

It was the third pregnancy of the patient. She had one missed abortion and one previous caesarean delivery. The patient had obstetrical scans at 13th and 19th weeks – no pathologies were detected and no further investigations were required. In the first trimester the patient was suffering from hyperemesis gravidarum and she was complaining of mild constipation throughout this pregnancy. On the 18th week she presented to the hospital due to abdominal pain, lasting for 2 days, which arose from the lower abdomen and the left lumbal region and migrated to the umbilical region. Appendicitis was suspected and the patient was admitted to the surgery department for further investigation. The levels of C-reactive protein (CRP) were observed to be gradually increasing (from 23 to 40 mg/l in two days). However, the diagnosis of appendicitis was excluded by ultrasonography and the patient was discharged from the hospital and referred to the perinatology center for further surveillance. However, the patient did not seek further medical attention.

On referral at 27th week, the patient's blood pressure was 90/62 mmHg, pulse rate was 112 bpm. Physical examination revealed a positive Blumberg sign and blood tests showed leukocytosis of $22.89 \times 10^9/l$ and CRP of 289,3 mg/l. Nonhomogenous fluid was observed in the abdominal cavity by ultrasonography and a fine needle aspiration from pelvis minor was performed. Reddish cloudy fluid was obtained. The diagnosis of acute peritonitis of an unknown origin was diagnosed and, given the patient's ongoing symptoms, she underwent a diagnostic laparoscopy. Peritoneal washing of the abdominal cavity and drainage was performed via laparoscopy as well as an intraoperative esofagogastroduodenoscopy. The latter revealed a 1 cm long gastric-band-related defect in the stomach wall, covered with a layer of purulent exudate. Gastric band was not removed and no other radical surgical interventions were performed due to an ongoing pregnancy. After the surgery, the patient spent 7 days in the intensive care unit (ICU). Antimicrobial therapy was initiated with Meropenem 2 g intravenously every 8 h and was adjusted accordingly when the cultures of peritoneal fluid collected during surgery revealed *Streptococcus pyogenes* (group A beta-hemolytic streptococcus). No additional surgical interventions were indicated, CRP level decreased significantly. The patient recovered well and was discharged on the 14th postoperative day.

The patient was readmitted to the hospital at 37 weeks' of gestation. She had no complaints on admission and weighted 7 kg more than during her previous hospitalisation. Due to the remaining potential risk of repeated gastric-band-related complications the decision was made to not to prolong the pregnancy for longer and an uneventful caesarean

section was performed. A male neonate weighing 3060 g with Apgar scores of 9 at 1 min and 10 at 5 min was born. Due to the increased risk of complications, the patient was observed in an ICU for 24 h after the surgery. As the condition was stable, the patient has spent another 3 days in a postnatal ward together with her healthy newborn. The post-operative period was uneventful and the patient was discharged.

The work has been reported in line with the SCARE 2020 criteria [7].

3. Discussion

LAGB insertion was commonly used in women of childbearing age [2,8]. According to United Kingdom (UK) Obstetric Surveillance System, LAGB insertion was the primary surgical method of surgical weight reduction in the UK and in 2007 1700 bands were inserted in women under 40-years-old [9].

Despite the fact that LAGB is contraindicated for women who may become pregnant, the number of pregnancies after LAGB is increasing [2]. Moreover, the management of pregnancy following LAGB has not been well defined. Some clinicians advocate leaving the balloon inflated to limit food intake, reduce gestational weight gain and associated adverse perinatal outcomes [10]. Literature suggests that in pregnancies following LAGB a decreased incidence of gestational diabetes [11,12], maternal hypertension [11,12], abnormal fetal weight [13] and rates of caesarean delivery [13] can be observed in comparison with the obese control groups [11–13]. However, there are concerns that leaving a balloon inflated might reduce the intake of essential nutrients needed for normal fetal development and growth. In addition, band complications might occur more frequently if the balloon is left inflated due to increased intra-abdominal pressure during pregnancy [10]. In 2013 a systematic review, which compared the outcomes for mothers and babies in cases when a balloon was deflated at the beginning of the pregnancy versus the cases when balloon inflation was maintained during the pregnancy, was carried out. However, no studies met the criteria of inclusion and no conclusions could be drawn. To date no randomised controlled trials, which would compare elective deflation of a gastric band balloon in pregnancy with the intention to maintain balloon inflation, exist [10].

Nevertheless, a retrospective study of 5 years published in 2014 concluded that gastric bands are tolerated during pregnancy and have no negative implications on the fetus [2].

Gastric-band-related complications during pregnancy are rare with only a limited number of published reports available, such as gastric band slippage, migration and erosion, gastric torsion [2,14,15]. Only a few recent publications report gastric band penetration through the gastric wall during pregnancy [15–17]. In both cases at least a part of a gastric band had been removed and some additional surgical procedures on the stomach had been performed [15,17]. Moreover, in one of these cases the pregnancy ended in fetal demise [17]. However, very limited data on this topic is available and, to our knowledge, this is the first reported case of intragastric penetration of the gastric band in a pregnant woman, which was managed without any surgical procedures on the stomach or gastric band removal during pregnancy and which had a good outcome for both, the patient and her baby.

The clinical presentation of gastric band erosion is usually nonspecific [1], while intragastric penetration of the gastric band may present with epigastric pain, hematemesis, transient or complete gastric obstruction, peritonitis [18].

Gastric band erosion with intragastric band migration is considered to be one of the most worrisome LAGB-related complications because of the risk of a subsequent obstruction, peritonitis, and sepsis [1]. Therefore, prompt and accurate diagnosis is crucial. Our case posed a challenge in diagnosis. First, the patient presented with nonspecific abdominal pain and there were no symptoms of bowel obstruction. Second, her status of being pregnant posed a further challenge in the diagnosis as there were limited helpful imaging modalities that could be used safely without posing radiation risk. The decision to operate early

was correct and we believe that the delay in the operation could have led to an extremely critical condition of the patient and the loss of pregnancy.

4. Conclusion

The management of LAGB-related complications during pregnancy remains controversial. While the removal of gastric band is considered to be the most effective way of managing this complication and preventing repeated complications, medical evidence suggests that keeping the gastric band during pregnancy may as well be an option.

This case illustrates the need for a practitioner to maintain high index of suspicion of gastric-band-related complication during pregnancy and early referral for bariatric surgical assessment is recommended. Ideally, these patients should be taken care of by a multidisciplinary team with experience in the management of pregnancies as well as surgical complications of BS.

Sources of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

Ethical approval has been given.

Relevant ethics committee: Vilnius University Hospital Santaros klinikos Clinical Research Department.

Ref. No.: 21VR-16494.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Gabija Didziokaite: conceptualization, manuscript drafting, acquisition and interpretation of data, manuscript drafting, critical revision and approval of the manuscript, project administration, guarantor.

Diana Ramasauskaite: conceptualization, acquisition and interpretation of data, critical revision and approval of the manuscript, supervision, guarantor.

Tomas Poskus: conceptualization, acquisition and interpretation of data, critical revision and approval of the manuscript.

Laura Malakauskiene: conceptualization, acquisition and interpretation of data, critical revision and approval of the manuscript.

Research registration

None.

Guarantor

Gabija Didziokaite, Diana Ramasauskaite.

Declaration of competing interest

The authors declare no conflict of interest.

Acknowledgements

Assoc. Prof. Dr. Saulius Mikalauskas MD, PhD.

Provenance and peer review

Not commissioned, externally peer-reviewed.

References

- [1] P. Hota, D. Caroline, S. Gupta, O. Agosto, Laparoscopic adjustable gastric band erosion with intragastric band migration: a rare but serious complication, *Radiol. Case Rep.* 13 (1) (2017 Dec 13) 76–80.
- [2] V. Pilone, A. Hasani, R. Di Micco, A. Vitiello, A. Monda, G. Izzo, et al., Pregnancy after laparoscopic gastric banding: maternal and neonatal outcomes, *Int. J. Surg. Lond. Engl.* 12 (Suppl 1) (2014) S136–S139.
- [3] V. Falcone, T. Stopp, M. Feichtinger, H. Kiss, W. Eppel, P.W. Husslein, et al., Pregnancy after bariatric surgery: a narrative literature review and discussion of impact on pregnancy management and outcome, *BMC Pregnancy Childbirth* 18 (1) (2018 Dec 27) 507.
- [4] A. Kumari, A. Nigam, Bariatric surgery in women: a boon needs special care during pregnancy, *J. Clin. Diagn. Res.* 9 (11) (2015) QE01–QE05. Nov.
- [5] L. Angrisani, A. Santonicola, P. Iovino, A. Vitiello, K. Higa, J. Himpens, et al., IFSO worldwide survey 2016: primary, endoluminal, and revisional procedures, *Obes. Surg.* 28 (12) (2018 Dec) 3783–3794.
- [6] I. Guelinckx, R. Devlieger, G. Vansant, Reproductive outcome after bariatric surgery: a critical review, *Hum. Reprod. Update* 15 (2) (2009 Apr) 189–201.
- [7] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, SCARE Group, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, *Int. J. Surg. Lond. Engl.* 84 (2020) 226–230. Dec.
- [8] G. Papadimitriou, K. Vardas, K. Alfaras, P. Alfaras, Laparoscopic adjustable gastric band: 4-year experience and learning curve, Available from, *JLSL* 19 (1) (2015), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4370035/>.
- [9] Pregnancy after Gastric Band Surgery | UKOSS [Internet], Available from, <https://www.npeu.ox.ac.uk/ukoss/completed-surveillance/pgbs>.
- [10] A.E. Jefferys, D. Siassakos, T. Draycott, V.A. Akande, R. Fox, Deflation of gastric band balloon in pregnancy for improving outcomes, *Cochrane Database Syst. Rev.* (4) (2013), CD010048. Apr 30.
- [11] A.J. Skull, G.H. Slater, J.E. Duncombe, G.A. Fielding, Laparoscopic adjustable banding in pregnancy: safety, patient tolerance and effect on obesity-related pregnancy outcomes, *Obes. Surg.* 14 (2) (2004 Feb) 230–235.
- [12] J.B. Dixon, M.E. Dixon, P.E. O'Brien, Birth outcomes in obese women after laparoscopic adjustable gastric banding, *Obstet. Gynecol.* 106 (5 Pt 1) (2005 Nov) 965–972.
- [13] G. Ducarme, A. Revaux, A. Rodrigues, F. Aissaoui, I. Pharisien, M. Uzan, Obstetric outcome following laparoscopic adjustable gastric banding, *Int. J. Gynaecol.* 98 (3) (2007 Sep) 244–247.
- [14] S.van Wessel, I. Dehaene, Y.V. Nieuwenhove, M. Coppens, K. Scharpe, K. Roelens, Unusual bariatric complication in pregnancy, Available from, *Gynecol. Obstet. Case Rep.* 2 (1) (2016), <https://gynecology-obstetrics.imedpub.com/abstract/unusual-bariatric-complication-in-pregnancy-8588.html>.
- [15] M. Alawad, M. Abukhater, K. Al-Mohaimed, Eroded adjustable gastric band migration causing gastric obstruction and perforation in a pregnant lady, *Int. J. Surg. Case Rep.* 19 (71) (2020 May) 192–195.
- [16] Y.F. Ongso, H.N. Beh, Gastric band tubing-related complication during pregnancy, *J. Surg. Case Rep.* 2017 (11) (2017), rjx241. Nov.
- [17] G. Matharoo, S. Shah, S. Binenbaum, F. Borao, Abdominal catastrophe during pregnancy due to a gastric band, *CRSLS MIS Case Rep SLS.* 16 (2014 Nov) 18.
- [18] D. Garrido, L.M. Bush, Liver abscess as a complication of laparoscopic gastric banding bariatric surgery, *Surg. Infect.* 14 (5) (2013 Oct) 464–469.