



Original article

Obstetric outcomes after restrictive bariatric surgery: what happens after 2 consecutive pregnancies?

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Abstract

Background: The objective of this study was to compare the outcomes of 2 consecutive pregnancies of the same women who conceived after restrictive bariatric surgeries.

Methods: A retrospective study comparing consecutive pregnancy outcomes of the same women, who conceived before and twice after a restrictive bariatric surgery, was conducted.

Results: This study included 109 women, and therefore, 327 paired pregnancies: 109 pregnancies preceded and 218 followed restrictive bariatric surgery (87% had laparoscopic banding, and 13% had silastic ring vertical gastropasty). Both prepregnancy and predelivery body mass index were significantly lower after bariatric surgery (36.7 ± 4.4 versus 31.5 ± 5.5 , $P < .001$; 40.6 ± 5.5 versus 35.3 ± 6.1 , $P < .001$; respectively). This effect was preserved at the subsequent pregnancy (31.5 ± 5.5 versus 31.3 ± 6.3 , $P = .609$, and 35.3 ± 6.1 versus 35.1 ± 5.9 , $P = .706$, respectively). The rates of hypertensive disorders and gestational diabetes mellitus were significantly lower after the bariatric operation, for the first and the second pregnancy (21% versus 7.4% and 4.7%, $P = .009$, and 19% versus 5.6% and 6.6%, $P = .007$, respectively). The rate of macrosomic newborn was significant lower in the second postbariatric pregnancy (11.1% before versus 1.1% after second pregnancy, $P = .02$). Using multiple logistic regression models controlling for maternal age, prepregnancy body mass index, and the type of surgery, the reduction in hypertensive disorders (adjusted odds ratio (OR) .3, 95% confidence interval (CI) .12–.82; $P = .018$ for the first postoperative pregnancy and adjusted OR .2, 95% CI .06–.64; $P = .007$ for the second postoperative pregnancy), and gestational diabetes mellitus (adjusted OR .2, 95% CI .06–.48; $P = .001$ for the first postoperative pregnancy and adjusted OR .3, 95% CI .05–.51; $P = .002$ for the second postoperative pregnancy) remained significant.

Conclusions: A significant decrease in pregnancy complications, such as hypertensive disorders and gestational diabetes mellitus, is achieved after a restrictive bariatric surgery. This improvement is maintained at the second subsequent pregnancy. (Surg Obes Relat Dis 2013;■:00–00.) © 2013 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords:

Pregnancy; Restrictive bariatric surgery; Obesity; Hypertensive disorders; Diabetes mellitus

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The prevalence of overweight and obesity has increased significantly over the past 20 years, mostly in Western society [1–3]. Weight gain and obesity are posing a growing threat to health, and obesity has been termed an epidemic [1–3]. About 30% of women of childbearing age

(20–39 years) are classified as obese (body mass index [BMI] >30 kg/m²), and an additional 25% of women in this age group are overweight (BMI >25 kg/m²) [1,4].

Obesity has high rates of associated medical problems, such as coronary heart disease, hypertensive disorders, diabetes mellitus, and stroke. Adverse pregnancy outcome of obese women has been shown, including an increased incidence of the following complications: gestational hypertension and preeclampsia, gestational diabetes mellitus (GDM), and fetal macrosomia (birth weight above 4 kilograms). During labor, obesity increases the risk for cesarean delivery and the associated complications of anesthesia [5–10].

The target of obesity treatment is to achieve and maintain a healthier and lower weight [6]. Weight loss before conception is the best way to reduce the risk for medical and obstetric complications in obese women. As a result of the short-term success that lifestyle changes and medical treatments have had in maintaining weight loss, bariatric surgery has become a significant alternative for obese women planning pregnancy [11].

The few studies that have investigated pregnancy outcome after bariatric surgeries have reported that women are not at high risk for adverse perinatal outcomes after bariatric surgery [12–21]. Furthermore, the risk of obesity-related gestational complications decreased significantly after bariatric surgery compared with parturient obese women [12–21]. The effect of bariatric surgery on the percentage of cesarean deliveries is not entirely clear, because reported rates before and after surgery vary widely between studies [17,19–21]. Parity is a significant risk factor for weight gain and visceral obesity [22].

The long-term effect of bariatric surgery on subsequent pregnancies has not yet been studied. We hypothesized that weight gain in the second pregnancy after the bariatric operation would increase and, accordingly, the improvement in obesity-related gestational complications would decrease in the second pregnancy. The objective of the present study was to compare the outcomes of the consecutive pregnancies of the same women who conceived at least once before the restrictive bariatric surgery and at least twice after the operation.

Materials and methods

A retrospective population-based cohort study that compared pregnancy outcomes of the same women, who conceived before and at least twice after a bariatric surgery, was conducted. Deliveries occurred during the years 2006 and 2012 at the Soroka University Medical Center. This is the sole hospital in the Negev, the southern part of Israel, and serves the entire obstetric population in the area. Thus, the study represents nonselective data. During this time period, data was collected on women who had restrictive

bariatric surgery and who had at least 1 delivery before and 2 after the bariatric surgery.

Data were collected using the hospitalization files from the Obstetric and Gynecology Department and the Surgery Department of the medical center. Information regarding the pregnancies and deliveries were reported by an obstetrician directly after delivery and coded by skilled medical secretaries into the perinatal database. The secretaries routinely reviewed the information before entering it into the database. Coding was performed after assessing the medical prenatal care records together with the routine hospital documents. Pregnancies designated with the International Classification of Diseases (ICD-9) code V453 (pregnancy after bariatric surgery until 2007) or the code V4586 (pregnancy after bariatric surgery since 2007) were recorded and preceding pregnancies were matched. Most bariatric operations were performed by only 4 specialist surgeons.

The following clinical characteristics were analyzed: maternal age, gravidity, parity, BMI before pregnancy, BMI before delivery, BMI before the bariatric operation, smoking during pregnancy, and the type of the bariatric surgery (laparoscopic gastric banding [LAGB] or silastic ring vertical gastropasty).

In addition, the following pregnancy and labor characteristics were assessed: gestational age, hypertensive disorders (chronic hypertension, gestational hypertension, and preeclampsia), pregestational diabetes mellitus, GDM, infections during pregnancy, intrauterine growth restriction, polyhydramnios, oligohydramnios, abortions, labor induction and augmentation, malpresentation, mode of delivery (partum spontaneous, instrumental, or cesarean delivery), and maternal anemia (defined as hemoglobin <10 mg/dL).

The following perinatal outcomes were collected: gender, birth weight, Apgar score at 1 and 5 minutes, and perinatal mortality. The study was approved by the local ethics committee of the hospital.

Statistical analyses were performed using SPSS version 17 (SPSS, Chicago, IL). Paired categorical, dichotomous variables were compared using the McNemar's-Bowker test as appropriate. For continuous variables, paired *t* test were used. Multivariate logistic regression models were constructed to control for confounders. Odds ratios (OR) and their 95% CI were computed. *P* $< .05$ was considered statistically significant.

Results

After excluding patients without at least 1 delivery before and 2 deliveries after the bariatric operation, or those occurring before 2006, the study included 109 women and, therefore, 327 paired pregnancies; 109 pregnancies preceded and 218 followed restrictive bariatric surgeries. Of the restrictive bariatric surgeries, 87% were LAGB, and 13% were silastic ring vertical gastropasty.

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