



Original article

The effect of bariatric surgery on gout: a comparative study

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Abstract

Background: Obesity is a risk factor for the development of gout. An increased incidence of early gouty attacks after bariatric surgery has been reported, but the data is sparse. The effect of weight loss surgery on the behavior of gout beyond the immediate postoperative phase remains unclear. The objective of this study was to evaluate the pre- and postoperative frequency and features of gouty attacks in bariatric surgery patients.

Methods: Charts were reviewed to identify patients who had gout before bariatric surgery. Demographic and gout-related parameters were recorded. The comparison group consisted of obese individuals with gout who underwent nonbariatric upper abdominal procedures.

Results: Ninety-nine morbidly obese patients who underwent bariatric surgery had gout. The comparison group consisted of 56 patients. The incidence of early gouty attack in the first month after surgery was significantly higher in the bariatric group than the nonbariatric group (17.5% versus 1.8%, $P = .003$). In the bariatric group, 23.8% of patients had at least one gouty attack during the 12-month period before surgery, which dropped to 8.0% during postoperative months 1–13 ($P = .005$). There was no significant difference in the number of gouty attacks in the comparison group before and after surgery (18.2% versus 11.1%, $P = .33$). There was a significant reduction in uric acid levels 13-months after bariatric surgery compared with baseline values (9.1 ± 2.0 versus 5.6 ± 2.5 mg/dL, $P = .007$).

Conclusion: The frequency of early postoperative gout attacks after bariatric surgery is significantly higher than that of patients undergoing other procedures. However, the incidence decreases significantly after the first postoperative month up to 1 year. (Surg Obes Relat Dis 2014;■:00–00.) © 2014 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords:

Obesity; Bariatric surgery; Gout; Gouty attacks; Uric acid

Obesity is a major risk factor for the development of gout [1]. Characterized by monosodium urate crystal deposition, gout can lead to devastating arthropathies and significant renal disease. As the worldwide obesity epidemic grows, so will the relevance of gout in bariatric populations, and there is a paucity of literature addressing this uncommon but important

subject. The incidence of gout is also on the rise and recent data suggests that patients are developing gout at an earlier age. This is likely due to the same changes in dietary habits that contribute to obesity [2]. There have been reports of increased incidence of gouty attacks after obesity surgery and the immobility associated with acute arthropathies in the early postoperative period can pose a significant problem in the fragile postoperative bariatric surgery population. However, the effect that weight loss surgery has on gout activity beyond the early postoperative phase remains unclear.

Only 2 publications address gout in bariatric surgery and they focus on immediate postoperative outcomes in small

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retrospective cohorts [3,4]. Numerous studies have shown decreased uric acid levels after weight loss from dietary, medical, or surgical means [5–7], but there are no reports addressing the clinical effect bariatric surgery has on gout after the early postoperative period. Understanding the short- and long-term consequences of obesity surgery on gout disease activity may contribute to developing a more tailored approach for these patients. The aim of this study was to assess the postoperative and late effects of bariatric surgery on gout arthritis.

Methods

Approval for this study was granted by the Cleveland Clinic Institutional Review Board. Using our bariatric database, we identified morbidly obese patients with a diagnosis of active gout who underwent bariatric surgery at our center between January 2004 and December 2012. We defined active gout as the presence of at least 1 documented episode or evidence of medication usage. Obese patients with active gout who underwent upper abdominal surgery at the same institution during the same time were identified for the comparison group, based on relevant key words or codes. Patients' data 12 months before surgery and 13 months after the procedure were collected via electronic patient chart review. Preprocedure variables included age, sex, height, weight, co-morbidities, glycated hemoglobin, lipid panel, blood pressure, number of preoperative gout attacks, and uric acid level. Type of surgery, type of gout prophylaxis used, and body mass index (BMI) were the perioperative parameters extracted. Postoperative data included duration of follow-up, number of gout attacks, uric acid level, and need for ongoing medical treatment. We considered early attacks as those occurring within the first postoperative month and late attacks as those that took place from postoperative month 1–13. Allopurinol and febuxostat were considered prophylactic gout medications.

Categorical and continuous variables were reported as frequencies (%) and mean $\pm$ SD, respectively. Comparisons between the 2 groups were performed using the χ^2 and t test, where applicable. Z-test was used to compare 2 dependent proportions. Paired differences between the follow-up point and baseline were calculated using paired t test. A P value of $<.05$ was considered statistically significant.

Results

The prevalence of gout in our bariatric population was 2.6% (99 patients out of 3,808 during the study period). Only 2 patients developed gout de novo after the bariatric procedure. The bariatric surgery group with prior diagnosis of gout had a male-to-female ratio of 3:1, a mean age of 52.1 ± 10.3 years and an average BMI of 49.5 ± 11.9 kg/m².

Table 1
Baseline Characteristics

	Bariatric group	Nonbariatric group	<i>P</i> value
Gender, f	74 (75)	34 (61)	.07
Age, yr	52.1 ± 10.3	63.3 ± 11.9	$<.001$
BMI, kg/m ²	49.5 ± 11.9	36.8 ± 9.8	$<.001$
Use of prophylaxis	53 (56)	23 (42)	.09
Incidence of preop attacks (1 yr)	20 (23.8)	10 (18.2)	.43
Uric acid level, mg/dL	9.1 ± 2.0	7.7 ± 2.0	.91

BMI = body mass index.

Values are mean $\pm$ standard deviation or n (%).

At the time of surgery, there was no significant difference in the baseline characteristics between the bariatric and nonbariatric groups with respect to gender ($P = .07$), uric acid level ($P = .91$), use of allopurinol (56% in bariatric, 42% in comparison group, $P = .09$), and incidence of early gout attack in the preceding 12 months ($P = .43$). However, bariatric cases were, on average, 11.2 years younger ($P < .001$) and 12.7 BMI points heavier ($P < .001$) than the nonbariatric group (Table 1). Bariatric procedures performed in the study group included Roux-en-Y gastric bypass ($n = 69$), sleeve gastrectomy ($n = 22$), and adjustable gastric banding ($n = 8$). All procedures were done laparoscopically. In the comparison group ($n = 56$), 44 (78.6%) patients had a laparoscopic cholecystectomy, 6 (10.7%) had open cholecystectomy, 5 (8.9%) had open cholecystectomy with another concomitant procedure, and 1 (1.8%) had a laparoscopic Heller myotomy.

The bariatric surgery group showed satisfactory BMI reductions of 3.8 ± 5.1 kg/m² at 1 month and 10.8 ± 6.8 kg/m² at 13 months after surgery. The mean BMI decrease for the comparison group at 1 month was minimal ($-.4 \pm 1.9$ kg/m²), and patients experienced weight gain at 13 months ($.5 \pm 3.1$ kg/m²). Differences between the groups were significant at 1 month ($3.4 \pm .6$ kg/m², $P < .001$) and at 13 months (11.3 ± 1.0 kg/m², $P < .001$).

The incidence of postoperative gout attack within the first month after surgery was significantly higher in the study group compared to the nonbariatric group (17.5% versus 1.8%, $P = .003$). In the bariatric cohort, 23.8% of patients had at least 1 gouty attack during the 12-month period before surgery compared to 8.0% during postoperative months 1–13 ($P = .005$). However, in the comparison group, the rate of occurrence of at least 1 gouty attack during the 12-month period before surgery and during postoperative months 1–13 was not statistically significant (18.2% versus 11.1%, $P = .33$) (Table 2). Incidence of gout attacks within the first month after surgery and between months 1–13 was not statistically different among specific bariatric procedures. There was a significant reduction in uric acid levels 13 months after bariatric surgery compared with baseline values (9.1 ± 2.0 versus 5.6 ± 2.5 mg/dL, $P = .007$) but no significant change was observed for this variable in the nonbariatric group (7.7 ± 2.0 versus 7.0 ± 1.6 mg/dL, $P = .10$) (Fig. 1).

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