Gouty attacks occur frequently in postoperative gastric bypass patients

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Abstract

Background: Both obesity and surgery are known risk factors for instigating gouty attacks. We describe the incidence and management of postoperative gouty attacks after bariatric surgery.

Methods: We performed a retrospective, multi-institutional review of 411 consecutive laparoscopic gastric bypass patients and identified all patients with postoperative gouty attacks.

Results: Of the 411 patients reviewed, 21 (5.1\%) had a previous diagnosis of gout. Of these 21 patients, 7 (33.3\%) had an acute attack postoperatively. No patient who had never had a preoperative episode developed gout. In 4 of the 7 (57.1\%) patients, the attack was severe enough to require treatment with corticosteroids. Monoarticular attacks occurred in 5 (71.4\%) of the 7 patients, and polyarticular attacks occurred in 2 (28.6\%). The joints involved included the toes, ankles, and wrists. One patient presented with cervical gout and developed polyarticular gout that required a significant rehabilitation stay.

Conclusion: The morbidity of postoperative gouty attacks in bariatric surgery patients is significant. Patients with a history of gout should be given prophylactic treatment and closely monitored.

Keywords: Gout; Gastric Bypass; Obesity; Postoperative care

The incidence of gout is increasing and is thought to be related to the increasing prevalence of obesity and the metabolic syndrome in the United States \cite{1,2}. The Third National Health and Nutritional Examination Survey estimated that the prevalence of gout is >2\% in men \textgreater 30 years old and women \textgreater 50 years old \cite{3}. The Rochester Epidemiologic Project found the incidence of primary gout had doubled during the past 20 years \cite{4}. Gout is becoming a more common co-morbidity encountered by the physician caring for obese patients \cite{5}.

High levels of serum uric acid are required for gout to develop. Hyperuricemia leads to urate saturation, which causes the formation of monosodium urate crystals. The interaction between these crystals and leukocytes leads to the symptoms of gout \cite{6}. When these microcrystals of monosodium urate are deposited in articular and extra-articular tissues, these tissues can become inflamed.

Serum uric acid levels are dependent on a balance among dietary intake, synthesis, and excretion. Hyperuricemia is caused by urate overproduction or poor renal clearance of urate, or both. Obesity has been implicated as a cause of both urate overproduction and poor renal clearance \cite{7}. Other factors related to hyperuricemia include excess alcohol or rich food consumption and insulin resistance. Studies have shown that weight loss significantly changes the urate metabolism, causing a reduction in the serum urate concentration and increased renal clearance of urate \cite{8}.

The factors that have been identified that can precipitate an acute episode of gout include infection, trauma, surgery,
crash dieting, total parenteral nutrition, and the initiation of uric acid-lowering therapy [9]. However, very few studies have examined the relationship between weight loss surgery and the postoperative occurrence of gout. We examined the incidence of gout in the morbidly obese population who had undergone Roux-en-Y gastric bypass. We also determined the incidence of acute gouty attacks in these patients postoperatively and the treatment required.

Methods

In this multi-institutional retrospective study, we reviewed the medical charts of 411 consecutive patients who had undergone standard antecolic, antegastric Roux-en-Y gastric bypass surgery between July 2003 and September 2006 for age, height, weight, body mass index, a documented medical history of gout, and the postoperative course. All patients at both institutions had undergone similar preoperative preparation, including a clear liquid diet with protein supplementation for 4–7 days before surgery and a mechanical bowel preparation 2 days before surgery. The uric acid levels were not routinely measured before or after surgery; however, documentation of previous gouty attacks was required for inclusion in the study. All the patients who had undergone gastric bypass and experienced a postoperative gouty attack were included in this study.

Results

A total of 411 patients were included in this study. Of these 411 patients, 164 (40%) were treated at the Sacred Heart Institute for Surgical Weight Loss and 247 (60%) were treated at the Albert Einstein Healthcare Network. Of these 411 patients, 21 (5.1%) had a previous diagnosis of gout. All 21 of these patients had a history of gout that had required medical treatment. Of the 21 patients, 15 were men (71.4%). Six of the 21 patients were women (4.8%). The mean patient age was 52 years (range 32–73). The mean preoperative body mass index was 49.6 kg/m² (range 36.1–63). Of the 21 patients, 20 (95.2%) had undergone laparoscopic Roux-en-Y gastric bypass and 1 (4.8%) had undergone an open procedure. Seven (33.3%) of the 21 patients had an acute gouty attack postoperatively. In 4 (57.1%) of the 7 patients, the attack was severe enough to require treatment with corticosteroids. Monoarticular attacks occurred in 5 (71.4%) and polyarticular attacks occurred in 2 (28.6%) of the 7 patients. One patient with severe polyarticular gout required a significant rehabilitation stay. All attacks occurred within the first 6 months postoperatively. No additional significant complications occurred in these 21 patients.

Discussion

The incidence of primary gout has doubled during the past 20 years. Obesity is a documented risk factor for gout because it affects the metabolism and excretion of urate [10]. This increase in the incidence of gout is thought to be related to the increasing prevalence of obesity, which is now at epidemic proportions in the United States. A relationship has been demonstrated between an increasing body mass index and high serum urate levels [11]. Hyperuricemia is necessary for gout to develop. Several additional risk factors that can precipitate an attack of gout have been identified, including diet, alcohol consumption, hypertension, diuretic use, surgery, and trauma. In addition, active weight loss and periods of starvation have been identified as risk factors for hyperuricemia and acute gouty attacks [12]. Any or all of these risk factors could contribute to the high incidence of gouty attacks among bariatric patients with a previous history of gout in the postoperative period.

Several studies have documented decreased serum urate levels in the long term after weight loss induced by medication, diet, or surgery. Decreased purine synthesis and a reduction in urate levels have been observed in patients after weight loss using medication, such as sibutramine and orlistat [13]. The same effect was observed in patients who had lost weight from a diet consisting of calorie and carbohydrate restriction and increased protein and unsaturated fat [14]. The bariatric patients in the present study were instructed to consume a similar high protein diet postoperatively that primarily consisted of protein supplementation. The Swedish Obese Subjects Study demonstrated decreased serum urate levels 2 and 10 years after bariatric surgery [15]. In a literature review, only 1 other study addressed the effects of weight loss from bariatric surgery on gout.

In a similar previous retrospective study of the incidence of gout in bariatric patients, 5 (0.4%) of 1240 patients who had undergone laparoscopic gastric bypass had a history of gout. Of these 5 patients, 40% had an acute gouty attack in the postoperative period [16]. Our study found a significantly greater incidence of gout in our patient population (5.1%). In concordance with the previous study, we discovered a significant number of patients with a preoperative diagnosis of gout who developed an acute episode postoperatively (33.3%). All attacks occurred within the first 6 months postoperatively, the period in which the greatest amount of weight loss occurs. Frequently, the episodes of gout were very debilitating for the patients and required hospitalization. One patient (4.8%) required a significant rehabilitation stay. In addition, a significant number of these patients required treatment of their gouty attack with corticosteroids (57.1%).

A possible explanation for the high incidence of gouty attacks postoperatively is the diet these patients are instructed to consume after their operation. Postoperative bariatric patients at both institutions involved in this study are instructed to ingest a minimum of 60 g of protein daily. During the first few months after the operation, most of the protein is ingested through protein supplements. Patients gradually meet their protein requirements through dairy,
chicken, seafood, and meat products. Urate is formed from the metabolism of purines. Foods such as meat or seafood with a high purine content and high-protein diets have been implicated as risk factors for developing gout. The serum uric acid levels and the risk of gout increase in people consuming diets rich in meat and seafood [17]. A study showed that men who ingested a large amount of seafood had a 51% greater risk of developing gout than those who had a smaller amount of seafood in their diet. Men ingesting a large amount of meat had a 41% greater risk of developing gout than those who consumed a smaller amount of meat in their diet [18]. However, bariatric patients are not able to eat such a large amount of seafood or meat, making their diet an unlikely source of their gouty attacks. Bariatric patients are commonly instructed to eat a high-protein, low-carbohydrate diet postoperatively. This is similar to the diet that has been shown to reduce serum urate levels [19]. Bariatric patients are also dissuaded from drinking alcohol. Any diuretics that patients are taking preoperatively are commonly discontinued postoperatively to lower the risk of dehydration.

Trauma and surgery are both associated with acute attacks of gout because of increased tissue breakdown, periods of starvation, or dehydration. One retrospective study quoted a rate of gouty attacks after surgical procedures at 17% [20]. In addition, periods of accelerated weight loss after weight loss surgery could play a role in the high rate of gouty attacks in this patient population. All these factors could be related to the high occurrence of acute attacks of gout (33.3%), as well as the increased severity of these attacks in patients with a history of gout after gastric bypass surgery.

Our study had several limitations. One limitation was the small sample size. An additional limitation was that the serum uric acid levels were not measured. An interesting future study would be to measure the serum uric acid levels in all patients with a history of gout in the postoperative period.

Conclusion

We found that patients with a preoperative history of gout who undergo laparoscopic gastric bypass are at a significant risk of developing perioperative gouty attacks, despite significant weight loss. The pathogenesis could be multifactorial, related to ongoing weight loss, surgery, dehydration, dietary modification, and renal impairment. Patients thought that their symptoms of gout had worsened during the first 6 months postoperatively, the period in which their weight loss is greatest. Gout is an increasingly more common medical problem and is associated with obesity. Prophylaxis might be warranted in all patients with a history of gout who undergo bariatric surgery.

Disclosures

The authors have no commercial associations that might be a conflict of interest in relation to this article.

References