Short Report

Is histopathological examination of sleeve gastrectomy specimens necessary in areas endemic for gastric cancer?

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ABSTRACT

Background. The value of histopathological examination of a laparoscopic sleeve gastrectomy (LSG) specimen in areas endemic for *Helicobacter pylori* (*H. pylori*) and gastric cancer is not known. We assessed the histopathological findings of LSG specimens to determine whether routine histopathological examination of these would be useful in patients with normal preoperative upper gastrointestinal endoscopy findings in an area endemic for gastric cancer.

Methods. We did a retrospective analysis of the histopathological findings of LSG specimens in patients who underwent the procedure between March 2015 and March 2017. We ascertained the association of positive histopathological findings with the clinical profile of patients and preoperative upper gastrointestinal endoscopy findings.

Results. Twenty-six patients (16 females) with a mean age of 37.5 years underwent LSG during the study period. On preoperative upper gastrointestinal endoscopy, 18 patients had unremarkable findings. Of the three patients with gastric or duodenal erosions on upper gastrointestinal endoscopy, two had *H. pylori* infection. On histopathological examination, 14 patients had unremarkable findings. Chronic gastritis with or without follicle formation was the most common finding ($n = 7$). None of the patients with normal upper gastrointestinal endoscopy findings had significant histopathological findings or evidence of *H. pylori* infection. No significant association was found between age, gender, body mass index, smoking and alcohol intake with positive histopathological findings ($p = 0.64$, 0.91, 0.90, 0.10 and 0.94, respectively).

Conclusions. We did not find clinically important histopathological findings on routine examination of the LSG specimen in bariatric patients with normal preoperative upper gastrointestinal endoscopy findings.

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INTRODUCTION

Laparoscopic sleeve gastrectomy (LSG) is a common bariatric procedure for morbidly obese patients. Most studies have focused on the surgical procedure, perioperative complications and outcomes of the procedure and not on the histopathology of the resected stomach.[1] Unlike Roux-en-Y gastric bypass, most of the stomach is resected in LSG, providing a specimen for pathological examination. Patients undergoing LSG are expected to have no significant abnormalities in the stomach. However, it has been reported that a considerable proportion of patients have histopathological changes in the specimen necessitating medical management and follow-up.[2] However, a few studies have reported that most of these LSG specimens had pathologically insignificant findings, and were an unnecessary burden for pathologists.[3,4]

Upper gastrointestinal endoscopy (UGIE) is the initial investigation of choice for gastro-oesophageal mucosal abnormalities. However, it is not done as a part of the preoperative evaluation of all morbidly obese patients in many centres.[5,6] Hence, the importance of histopathological examination of the LSG specimen in the setting of routine UGIE before surgery is not known. The association between *Helicobacter pylori* and gastric cancer is well established.[7] It is not uncommon to find *H. pylori*-induced gastritis during UGIE of asymptomatic patients in endemic areas.[8] The value of routine histopathological examination of LSG specimen in areas endemic for *H. pylori* and gastric cancer is not known.

We assessed abnormal histopathological findings in the LSG specimen to determine whether such examination would be useful in patients with no significant findings on UGIE in an area endemic for gastric cancer.

METHODS

This retrospective analysis was of a prospectively collected database of morbidly obese patients who underwent LSG from March 2015 to March 2017. Preoperative UGIE was done as part of the work-up in all patients. Antral biopsy was taken in patients with positive UGIE findings at the discretion of an endoscopist. The LSG specimen sent to a histopathology laboratory in formalin was grossly examined for any morphological abnormality. As a routine, four random 2-mm thickness sections taken from the LSG specimen were fixed in formalin and paraffin blocks were prepared. Additional sections were taken from the lesions found on gross examination or if there was any unexpected significant pathology on histological evaluation of the initial sections. Slides were stained with haematoxylin–eosin and were examined by pathologists in the form of permanent slides sliced to 3 μ thickness. The parameters analysed in the study included patient demography, UGIE findings and histopathology report of the LSG specimen.

Categorical variables were expressed as frequency and percentage and continuous variables as mean (SD). Chi-square or Fisher's exact test as appropriate was used to find associations between two or more categorical variables. Associations between two independent groups of quantitative variables were determined using unpaired *t*-test or Mann–Whitney U-test. Statistical analysis was done using the SPSS software version 19.0 (SPSS Inc.,

Chicago, IL, USA). p<0.05 was considered as statistically significant.

RESULTS

Demographic details

The mean (SD) age of the 26 patients was 37.5 (12.95) years, 16 of them were females. The mean (SD) body mass index (BMI) of patients was 45.3 (6.32) kg/m^2. Women had a slightly higher BMI than men (47.7 [5.79] *v.* 41.5 [5.36] kg/m^2) though the difference was not statistically significant (p=0.1). Six patients had diabetes, 12 had hypertension, 4 were smokers and 5 consumed alcohol.

UGIE

Preoperative UGIE was done in all patients, and it was unremarkable in 18 patients. Five patients had a lax lower oesophageal sphincter associated with hiatal hernia and oesophagitis in two patients and one patient, respectively. Two patients had gastric erosions and one had duodenal erosions. Antral biopsy was taken from five patients. Two patients had *H. pylori*-induced gastritis and received *H. pylori* eradication therapy.

Histopathological changes of LSG specimen

More than half the LSG specimens were microscopically normal (Table I). Chronic gastritis with or without follicle formation was the most common abnormality identified. None of the patients with follicular gastritis had associated *H. pylori* infection. None of them had precursors of adenocarcinoma such as dysplasia or carcinoma *in situ*.

Factors predicting histopathological changes

Histopathological changes in the LSG specimen were slightly more common in young men and those with higher BMI (Table II). However, none of these factors were found to be statistically significant. Smoking and alcohol consumption also lacked an association with the histopathological findings of the LSG specimen. Of the 18 patients with normal UGIE findings, 8 had histopathological abnormalities that included lymphoid follicles with lymphocytic infiltration (*n*=2), chronic inactive gastritis (*n*=2), lymphoplasmacytic infiltration (*n*=1), focal lymphocyte and eosinophil infiltration (*n*=2) and parietal cell hyperplasia (*n*=1). On histopathology, none of the patients with normal UGIE had evidence of *H. pylori* infection.

All patients except one had an uneventful postoperative course and were discharged on postoperative day 3. One patient had mild intolerance to liquids in the immediate postoperative period. This improved by postoperative day 5 and the patient was discharged on postoperative day 7. The patient had normal UGIE and no histological abnormalities in the LSG specimen.

Table I. Prevalence of histopathological changes in 26 laparoscopic sleeve gastrectomy specimens

Histopathology findings	*n* (%)
Unremarkable	14 (53.8)
Lymphoid follicles with lymphocytic infiltration	3 (11.5)
Chronic inactive gastritis	2 (7.7)
Chronic gastritis with lymphoid nodule formation	2 (7.7)
Lymphoplasmacytic infiltration	2 (7.7)
Focal lymphocyte and eosinophil infiltration	2 (7.7)
Parietal cell hyperplasia	1 (3.8)
Dysplasia or carcinoma	0

Table II. Factors predicting histopathological changes in laparoscopic sleeve gastrectomy specimens

Parameter	Abnormality (*n*=12)	No abnormality (*n*=14)	p value
Mean (SD) body mass index (kg/m^2)	46.46 (6.03)	44.6 (6.58)	0.635
Mean (SD) age (years)	34.6 (12.62)	39.3 (13.02)	0.906
Gender, n (%)			
Male	4 (40)	6 (60)	0.899
Female	6 (37.5)	10 (62.5)	—
Smoking, n (%)			
Yes	3 (75)	1 (25)	0.105
No	7 (31.8)	15 (68.2)	—
Alcohol intake, n (%)			
Yes	2 (40)	3 (60)	0.937
No	8 (38.1)	13 (61.9)	—

DISCUSSION

LSG is gaining popularity as a bariatric procedure due to its simplicity and reproducible results. The proportionate increase in the operative specimens increases the workload of pathologists. The reported abnormalities on histopathological examination of LSG specimens ranges from 31% to 65%.[1–3,9,10] In our study, abnormalities were found in less than half (46.2%) of the LSG specimens.

Most previous studies had chronic gastritis as the most common abnormal histopathology in the LSG specimen.[1–3] In our study, follicular gastritis and non-specific lymphoid aggregates were more common than chronic gastritis. The association of follicular gastritis and lymphoid aggregates with *H. pylori* infection or autoimmune gastritis has been previously reported with lymphoid follicles being frequently seen with *H. pylori* infection.[11] However, we did not observe an association with *H. pylori* infection.

The presence of lymphoid follicles on microscopic examination of the stomach can be a precursor for mucosa-associated lymphoid tissue (MALT) lymphomas.[12] However, the absence of immature cells in these follicles reduces the risk of evolution of lymphomas from these supposed precursor lesions. Furthermore, a few studies have described that such abnormalities in the stomach are insignificant and unlikely to progress to malignancy.[13]

Dysplasia or carcinomas were not identified in any of the specimens in our study. This is particularly interesting as carcinoma stomach is more prevalent in this part of the world and the incidence in well-preserved patients is on the rise.[14,15] Malhotra reported an incidence of 11.2/100 000 population in southern India; four times more than the incidence of gastric cancer in northern India.[14] However, incidental diagnosis of adenocarcinoma in an operative specimen following a bariatric procedure is extremely rare in the background of a normal UGIE. Although there are a few reports of gastric cancer diagnosed in patients several years after LSG, histological surprises in LSG specimens are unlikely if the preoperative UGIE was normal.[16]

Among the predictors of risk factors, we found that younger patients, male gender and higher BMI were associated with histological abnormalities in the LSG specimen. However, the association was found to be statistically insignificant possibly because of small numbers. None of the patients with histological abnormalities in the LSG specimen had an abnormal postoperative course. There was no need for any medical intervention or prolonged surveillance for the reported histological findings,

except for positive *H. pylori* infection that was detected on endoscopic biopsy. Thus, we infer that although few changes are found in nearly half of the LSG specimens, these are of not much clinical importance.

Despite the limitations of the study such as a retrospective analysis and small sample size, our report is possibly the first to analyse the role of histopathological examination of LSG specimens in the setting of preoperative UGIE in all patients in a gastric cancer-endemic area. We did not find clinically important pathology findings on histopathology of the LSG specimen in patients with normal preoperative UGIE. More and larger studies will be required in areas endemic for gastric cancer to confirm that histopathological examination of all LSG specimens could be avoided in bariatric patients with normal preoperative UGIE findings to reduce the unnecessary burden for pathologists.

Conflicts of interest. None declared

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