

Clinical Effectiveness of Routine Pathological Exam after Bariatric Laparoscopic Sleeve Gastrectomy

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Received date: November 20, 2018; Accepted date: November 26, 2018; Published date: December 03, 2018

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Abstract

Aim: To evaluate the clinical effectiveness of routine pathology exam as a diagnostic tool after laparoscopic gastric sleeve.

Method: A review of diagnostics coming from 347 bariatric gastric specimens sampled over four years.

Results: Only 6.3% of histology diagnostics were labelled as "normal"; "chronic gastritis" was found in 43.8%. Acute chronic gastritis was found in 13.6%, lymphocytic infiltration/aggregation in 22.2% and atrophic gastritis in 4.6% of cases. Almost 17% of diagnostics were considered "clinically relevant": infection/infestation with *Helicobacter pylori* - 12.4% and serious incidental findings - 4.3%. No malignancy was discovered.

Conclusions: Routine basic pathology exam after laparoscopic sleeve is clinical effective and it should be maintained as gold diagnostic standard after bariatric surgery.

Keywords: Gastric histology; Laparoscopic gastric sleeve; Bariatric pathology; Gastritis; *Helicobacter pylori* infestation

Introduction

Obesity gathered global pandemic dimensions, affecting patients of all ages [1]. A strong association between obesity, serious comorbidities (type 2 diabetes, cardiovascular disease, musculoskeletal disorders and certain cancers) and an increased risk of premature mortality was clearly demonstrated [2,3]. Weight loss improves both morbidity and mortality of obese patients but achieving significant and sustained results over time using conservative strategies is not easy [4-6].

Bariatric surgery is, to date, the most successful long term treatment for obesity. Surgical interventions improve both weight and obesity comorbidities in a fast and durable manner [7-10]. Between many available surgical procedures, Laparoscopic Sleeve Gastrectomy (LSG) is widely adopted because of good efficacy and safety profile [11,12].

With the introduction of laparoscopic techniques, the number of bariatric interventions increased dramatically [13-15]. Because of high costs and the increased number of interventions, a serious burden is posed over healthcare budgets. Many associated medical specialties that are connected with the bariatric surgery are under scrutiny, in order to control geometrically increasing intervention costs. Routine histologic exam of the gastric samples is one of these. Bariatric surgery is performed in order to reduce weight and patients usually do not have complex pathology associated - the clinically relevant information provided is scarce (same category as appendectomies or simple cholecystectomies) [16,17]. Based on legal demands and historical experience [18,19] it is customary that a pathologist should

examine every surgical specimen. Some opinions considered a complete anatomic pathology exam as unnecessary and (in most of cases) at least the routine microscopy should be abandoned [20]. Others still consider microscopic examination of the gastric wall as relevant and recommend histopathology as a key diagnostic tool that may influence patients' post operative care [21-25].

The objective of our research was to evaluate the clinical effectiveness of the routine histology exam of gastric wall specimens sampled after LSG performed in a general surgery unit over 4 years.

Materials and methods

We reviewed 347 histology reports concerning gastric wall specimens sampled after LSG done over 4 years in a general surgical center. In essence, one pathologist evaluated all specimens [26]. After a careful anatomic (macroscopic) evaluation, six random slices were sampled, stained (Hematoxylin Eosin and Giemsa) and examined. All samples were then investigated using standard optical microscopy HE and Giemsa staining. Grading of gastritis followed modified Sydney system [27]. We considered "clinical relevant diagnostics" any diagnostic that will require at least one follow up with the patients over the routine care. "Serious Incidental" diagnostic will always require special clinical attention.

Statistics

Results were analysed using Microsoft Excel software and are presented here using descriptive statistic (mean and standard deviation) [28]. Differences between groups were analysed with Student's t-test or Mann-Whitney U-test, as appropriate. Statistical

correlations between previously published data were also evaluated. P-value was set at $p < 0.05$.

Ethics

Patients provided written, informed consent before surgery specifically agreeing with the process and analyze of the pathology gastric samples. The study was approved by the “Sfantul Ioan” University Hospital Ethics Committee.

Results

In a 4 years retrospective review, we evaluated gastric wall specimens sampled from 347 obese patients after LSG. Patients (71% women) had an average age of 41.7 ± 3.9 years and a BMI of 40.1 ± 4.7 kg/m².

The most frequent histologic diagnostic was of gastritis: 291 patients (83%). Chronic gastritis was found in 51.2%, active chronic gastritis in 15.8%, follicular gastritis or benign lymphoid aggregates in lamina propria in 26.5% of cases and atrophic gastritis in 5.4% of all gastritis cases. 6.3% of specimens were labeled as “normal” [29-31]. 12.4% of patients had a Helicobacter pylori (HPyl) infestation diagnostic. Serious incidental diagnostics (3 gastric polyps, 6 cysts, 5 intestinal metaplasia and 1 case with GIST) were observed in 4.3% of patients. No neoplasms were detected in our data (Table 1).

	Histologic Diagnostic	% of patients
Normal	22	6.3
HPyl Infection/infestation	43	12.4
Incidental findings	15	4.3
Polyps	3	0.8
Cysts	6	1.7
Metaplasia	5	1.4
GIST	1	0.5
Gastritis (overall)	291	83.90%
Chronic Gastritis	152	43.8
Acute Chronic	46	13.3
Lymphocytic infiltrates	77	22.2
Atrophic Gastritis	16	4.6
Total patients	347	100%

Table 1: Post-bariatric gastric wall microscopic diagnostics over the whole study.

Discussion

The utility of a routine complete pathologic exam after bariatric laparoscopic gastric sleeve is a subject under debate. In order to evaluate the clinical effectiveness of histology in a well-characterized patient’s cohort, we retrospectively evaluated 347 histologic reports of gastric samples coming from severely obese patients that underwent LSG in a general surgical unit from a university hospital. In our

practice, a complete anatomic pathology exam is a medicolegal request and a trained pathologist must evaluate all surgical samples. All histology was performed in the university hospital pathology unit. We consider specific for our study an older, moderate to severe obesity population, possibly heavy infested with HPyl [32,33]. The absence of routine preop endoscopy and no HPyl serology diagnostics are also to be noticed.

Patients clinic demographic characteristics were: 70% females, average age 41.7 years and an average BMI of 40.1 kg/m². Our main histologic finding (in 83% of patients) was gastritis (chronic gastritis, acute chronic gastritis and lymphocytic infiltration) was. Atrophic gastritis was diagnosed in 4.6% of the patients. Serious incidental diagnostics were found in 4.3% of the cases but no neoplasms were identified in the study [34-38].

The number of direct positive HPyl diagnostics was lower than expected (12.4%) bearing in mind the high level of infestation previously reported at national level (68%) [39-41]. Considering all possible gastritis diagnostics associated with HPyl infection, were are coming close to the reported national infestation prevalence (Table 2) [10].

Age group	HPyl	ACG	FG	AG	Total Cases
less 20	0	1	1	0	2
21-30	6	8	14	2	30
31-40	13	11	23	1	48
41-50	9	9	18	5	41
51-60	7	11	13	2	33
more 60	8	6	8	6	28
Tot	43	46	77	16	182
% pts.	12.4	13.3	22.2	4.6	52.4

Table 2: HPyl histologic direct detection and possible associated pathologies (HPyl – Histologic Helicobacter diagnostic, ACG: Acute Chronic Gastritis; FG: Follicular Gastritis and Lymphocytic Infiltrations; AG: Atrophic Gastritis).

Our main research question was to evaluate the clinical effectiveness of the routine pathology exam after bariatric laparoscopic gastric sleeve [42,43]. Several publications already evaluated the clinical effectiveness (defined as histologic diagnostics that will need at least one clinical follow-up) of routine pathology in populations with different degree of HPyl infestation (Table 3).

Author	Patient s	HPyl Dg.%	Serious Incident Dg.%	Relevant %	Maintain
Abdul Gaffar	546	10	2.9	12.9	N
Saafan	1555	3.2	3.2	6.4	N
Hansen	351	2.6	6.2	8.9	N
Almazeedi	656	7.3	3.6	10.9	Y
Lauti	976	8.6	8.3	16.9	Y

Vardar	109	17.4	10.9	28.3	Y
Vrabie	347	12.4	4.3	16.7	Y
Danciu	70	11.4	3.1	14.5	NA
Clapp	145	18	0.7	18.7	NA
Raess	248	5.2	3.2	8.4	NA
Ohanessian	311	3.2	3.5	6.7	NA
Waledziak	82	13.7	2.3	16	NA
Kopach	511	2.7	5.8	8.5	NA

Table 3: Clinically relevant diagnostics in published histopathology studies after LGS

Specimen data not reported, all infected patients (41%) were treated pre-op with triple therapy, we presumed a 3.2% failure rate as reported by others.

Analysing published data, we observed a degree of differentiation in reporting results; finally all authors considered HPyl infestation or

infection and serious incidental findings as numbers of interest. In all studies, the most reported diagnostics were gastritis followed by “normality”. Relevant diagnostics were reported, on average in 13% of all data. Authors that were not adhering to the histology “golden diagnostic standard” concept reported an average of 4.6% HPyl infestation and a 3.5% of serious incidental findings. Authors that were in support of maintaining routine histology after all LSG reported an 8.2% of diagnostics with HPyl and a 6.7% of serious incidental diagnostics.

A strong correlation was found between the number of patients, the number of HPyl diagnostics ($r=0.847$, $p=0.0002$) and the number of incidental diagnostics ($r=0.811$, $p=0.0007$) in the cited literature.

It is true that there is a rarity of clinically serious incidental findings in LSG specimens (Table 4). Reported serious incidental findings vary between authors between 0.2 to 5.5%. Atrophic gastritis (not always included in the category of serious incidental), polyps and intestinal metaplasia are the most reported diagnostics and any of these findings can have a significant consequence over the life of the bariatric patient. In the light of increasing the number of LSG interventions and the increasing age of patients that are benefiting from it, a 1.5% reporting serious incidental diagnostics can be considered important.

	Metaplasia	Atrophy	Polyps	Granulomas	GIST	Other
Clapp	NA	NA	1.4	NA	NA	0.7
Almazeedi	0.2	1.8	0.6	0.5	0.2	0.6
AbdulGaffar	0.9	1.1	0.4	NA	NA	0.4
Vardar	8.7	4.3	NA	NA	1.4	1.4
Saafan	1.4	0.9	0.19	0.13	0.7	0.32
Ohanessian	1.3	3.9	5.5	0.3	1	1
Waledziak	NA	NA	NA	NA	1.3	1
Lauti	2.6	0.3	4.4	NA	0.4	0.5
Kopach	0.6	NA	3.9	NA	1	0.4
Hansen	2	NA	2.3	NA	NA	NA
Vrabie	1.4	4.6	0.8	NA	0.5	1.7
AVERAGE	2.1	2.4	2.2	0.3	0.8	0.8

Table 4: Serious Incidental diagnostics in different studies.

Our study reports 4.3% of serious incidental diagnostics consisting of 3 polyps, 6 cysts, 1 GIST and 5 cases of intestinal metaplasia and 4.6 % of atrophic gastritis. No malignancy was found in our 347 reports cohort.

Based on the definition of clinical relevant diagnostic, we report 57% of diagnostics as relevant (197 cases). The percentage of serious incidental is similar with the reported rate in the literature. Differences between previously published data and our reported data can be related with the degree of HPyl infestation of the population. A more targeted study will bring answers to this important clinical research question.

Conclusions

In our experience, routine pathology exam is effective in detecting histology diagnostics with clinical significance after LSG. Non-bariatric surgical centers working with patients with medico-surgical risk, with specific populations and where more sophisticated diagnostic procedures are not available for different reasons should maintain histology as “gold standard” after all bariatric surgical interventions.

Conflicts of Interest

“The authors declare that there is no conflict of interest regarding the publication of this paper.” No financially supporting bodies funded this paper.

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