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Gastric resection with Roux-en-Y reconstruction

Thesis summary

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INTRODUCTION

The first gastric resection performed was indicated for gastric cancer, later, in the 20th century, along with the standardization of the surgical and anesthetic procedures, peptic ulcer became the main indication for gastrectomy. The modern treatment of the peptic ulcer with antihistamines and proton pump inhibitors reduced drastically the gastric resections for gastric and duodenal ulcers, gastric cancer becoming the main indication. The development of modern diagnostic procedures has significantly contributed to the understanding of the mechanisms involved in the pathology of the upper gastrointestinal tract, diseases like gastroesophageal reflux disease or morbid obesity became new indications for gastrectomy.

The reconstruction of the digestive tract after a gastric resection has known throughout the time a series of modifications, some of the classic procedures like Billroth I, Billroth II or Roux being nowadays as actual as they were one century ago. Along with the current use of the stapling devices, the diversity of the reconstructive procedures has boomed, due to the decrease of the complexity of these operations.

The multitude of these reconstructive techniques and the broad spectrum of diseases of the upper digestive tract in which the gastrectomy is indicated, has determined a significant heterogeneity of the clinical studies, as a result, for many conditions there is no current standard surgical treatment.

All these facts have motivated the topic of this thesis – gastric resection with Roux-en-Y reconstruction. This procedure is widely performed and indicated in the pathology of the upper gastrointestinal tract, the subject being very modern, its approach combining elements of surgical technique and advanced statistical analysis.

LITERATURE REVIEW

The general part of the thesis is comprised in four chapters, containing up-to-date notions regarding the gastric anatomy and surgery.

The first chapter contains a historical review of the gastric surgery, with an emphasis of the chronological landmarks in the evolution of the gastric resection.

The second chapter details an anatomical description of the stomach, the pyloric region and the gastroesophageal junction, outlining the new findings with major importance in the gastric surgery.

In the third chapter of the thesis the main diseases of the upper digestive tract with surgical indications are summarized. The etiology, the pathophysiology, the medical and surgical treatment are detailed here. The data comprised in this chapter are based on many citations of the current literature.

The last chapter of the general part describes the post-gastrectomy syndrome, a syndrome that represents of the main motivations for the

preferential use of the Roux-en-Y loop reconstruction after gastric resection. I emphasized here two of the most important aspects of this syndrome – dumping and reflux, complications that through the use of the Y loop have a significantly lower incidence.

PERSONAL CONTRIBUTIONS

The original part of the thesis is also structured in four chapters, the first three containing the personal research on the gastric resection with Roux-en-Y reconstruction, each chapter being followed by conclusions. The last chapter represents the main conclusions of the thesis and synthetizes my contribution to the researched subject.

The first chapter of the special part is an analytic study that underlines the current indications of the gastric resection, detailing the reconstructive procedures based on the Roux-en-Y anastomosis.

The comparison between different clinical studies has allowed me to establish that the gastric and gastroesophageal cancer is nowadays the main indication for gastrectomy. The reconstructive procedures using the Roux-en-Y jejunal loop seem to offer the best postoperative results.

The gastroesophageal reflux disease, the most frequent benign pathology of the upper digestive tract in the western countries, is another major indication for Roux-en-Y gastric resection. This operation is reserved

though, for the cases where the first line of treatment (fundoplication) fails to improve the symptomatic or is followed by frequent recurrences.

Three other indications are: peptic ulcer (in selected cases), severe duodenal trauma (as a bypass procedure) and morbid obesity (biliopancreatic diversion).

The same chapter details the advantages and disadvantages of the reconstructive techniques with restoration of the duodenal passage and gastric pouch. Regarding these two procedures, the current literature studies show no homogeneity, many of the studies having contradictory results. This fact has motivated the two clinical studies the represent the chapter VI and VII of the thesis.

The first clinical study contains a series of 138 patients (cases of Acad. Prof. Dr. Zeno Popovici), operated between 1984 and 2002 in the surgical departments of the Clinical Emergency Hospital Bucharest and Clinical Emergency County Hospital Sibiu. The pathology for which the gastric resection was indicated includes both benign and malignant conditions: cancers (gastric, gastroesophageal junction and gastric remnant), peptic ulcers (gastric, duodenal and anastomotic), caustic stenosis and gastritis (reflux, hemorrhagic and caustic). The varied pathology, on which this study is based, provides the analysis a high degree of complexity.

The surgical procedures performed included different types of gastric resection: hemigastrectomy, 2/3 distal gastric resection, subtotal gastrectomy, total gastrectomy, degastro-gastrectomy. In some cases (especially for gastric carcinoma) multivisceral resections were performed.

The reconstructive procedures, based on the Roux-en-Y jejunal loop, were grouped into 2 categories: bypass procedures (gastrojejunostomy, esophagojejunostomy) and procedures with restoration of the duodenal passage (gastrojejunoduodenostomy, esophagojejunoduodenostomy). The overall morbidity in this series, in which more than half of the cases were emergency procedures, was 20.28% and the mortality 5.07%.

Through advanced statistical analysis, I was able to highlight the factors that significantly influenced the postoperative results. It has been proven that the patient’s chronological age has no influence on the postoperative results, the biological status being a far more important parameter in the establishing of the surgical indication.

Finally, based on the cancer cases (which nowadays are the main indication for gastric resection) I was able to draw pertinent conclusions regarding the emergency surgery for gastric cancer, the association of splenectomy and the multivisceral resection, the gastrectomy for palliative cases. Subtotal is preferred over total gastrectomy, in the cases where the first procedure is oncological feasible (distal tumors), due to the superior postoperative results. Emergency gastrectomy for complicated cancers is associated with high morbidity and mortality rates and should be avoided in the cases where the surgical procedure can be delayed. Also, due to the poor postoperative results, the palliative gastrectomy in advanced cancers is contraindicated in the cases where an alternative palliative procedure (that does not imply gastrectomy) is available. Splenectomy and multivisceral resections also increase the morbidity and mortality and thus are indicated only in the cases where a R0 resection can be obtained. The

statistical analysis has proven that the restoration of the duodenal passage has no negative influence on the postoperative results, and can successfully be used as an alternative reconstructive procedure.

The second clinical study of the thesis gathers my personal experience in a modern surgical department from Germany. The cases were represented by carcinomas of the stomach and the gastroesophageal junction. The series, comprising 35 patients (over a period of 2 years) was studied as a whole and by dividing it into 3 different groups. All the patients underwent an elective radical gastrectomy (subtotal or total) and the 3 groups were composed according to the reconstructive procedure: subtotal gastrectomy with gastro-jejunostomy, total gastrectomy with esophagojejunostomy and total gastrectomy with pouch reconstruction. All of these procedures were based on the Roux-en-Y jejunal loop and the anastomoses were performed using surgical staplers.

The analysis conducted on the entire series show results similar to the ones obtained in the first study, establishing the advantages of the subtotal over total gastrectomy and the negative influence of the poor biological status (expressed by low levels of serum proteins and albumin), the splenectomy and the multivisceral resections on the postoperative results.

Comparing the 3 groups (that were homogenous in regards to the clinical and biological characteristics) I was able to establish the influence if the reconstructive procedure on the postoperative nutritional status. This was obtained by comparing the evolutive curves of the hematocrit, hemoglobin, calcium, total serum protein and albumin levels. I was able to

prove the clear superiority of the pouch reconstruction after total gastrectomy. This type of reconstruction showed results similar to the gastro-jejunostomy after subtotal gastrectomy, thus being indicated as the choice reconstructive procedure after total gastrectomy.

The final conclusions of the thesis, presented in the last chapter, represent a review of the main personal contributions to the gastric resection with Roux-en-Y anastomosis. Through this thesis, I established the current indications of this surgical procedures, I pointed out a sum of ideas that are also present in the actual literature data regarding the gastrectomy for gastric cancer and I underlined the advantages of the pouch reconstruction based on the Roux-en-Y jejunal loop.

The final part of the thesis, the bibliography, contains 270 titles, cited in the order of appearance in text, most of them international articles published after 2000.