UNIVERSITY „OVIDIUS" of CONSTANŢA
GENERAL MEDICINE UNIVERSITY

PhD THESIS

THERAPEUTIC ATTITUDES IN POSTOPERATIVE INTESTINAL FISTULA

SCIENTIFIC COORDINATOR
Univ. PhD Dr. VASILE SÂRBU

PhD STUDENT
AHMED BERRO

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THE GENERAL PART

INTRODUCTION. HISTORY

The first mentioning of the Digestive Fistulas has been found inside the Old Testament, which is making reference to the post-traumatic entero-cutaneous fistula suffered by Eglon: "……and Eglon raised his hands, grabbed the dagger and he nestled in his belly…..and the dirt came out."

The first one who tried to surgically treat a Digestive Fistula was Celsius, who wrote: "When the colon has been penetrated, it can be sutured, without certainties, but with hope instead desperation, because sometimes it can be cured."

The purpose of this paper is to study the causes of the appearance of the external Digestive Fistulas, which are occurring after the surgery on the suture lines, represented either by nets or by digestive anastomosis and to propose solutions related to the diagnosis and the treatment, based on the cases of the Clinic of General Surgery from the Emergency Hospital of Constanta. The present thesis is including updates of certain problems that still spark contradicting discussion concerning the etio-pathogeny, the diagnosis and the treatment of postoperative Digestive Fistulas.

Inside the paper is also presented a pilot study of treatment of the postoperative Digestive Fistulas. The favorable results in 6 of 8 patients with digestive postoperative fistulas as a result of this treatment, however, must be confirmed by the original experimental studies and clinical trials, covering a larger number of patients.

This paper also gives me the opportunity to bring special thanks to PhD Sarbu Vasile, who guided my first steps in the surgery and who cultivated me with patience and wisdom the clinical sense and the one of the accuracy of the surgical act.

The given context is obliging me to limit the words of gratitude for Dr. Savin Silvia for her unconditional professional and moral support, who put her discrete but firm mark on each step of the long and the hard road of my professional becoming. With modesty, I'm thanking her for the quality of the surgical and personal moments offered in all these years, designed to establish a relationship based on respect and on a deep admiration, as well as for the qualities that I felt proud to borrow from her and to make them mine, although with less nobleness that their owner herself.

I'm reiterating, with my deepest love, the thanks that I'm bringing to my lovely family, to my wife and my boys, for both their patience and their love as well as for the permanent impetus provided, which offered me the necessary motivation and delicately excused the time spent away from them.

I'm dedicating my parents the result of my personal and professional becoming, which I'm hoping to make them proud and I'm infinite thanking them for all the support given along this very rough way that I have chosen.

The Definition of the Digestive Fistulas

The Fistulas are representing abnormal communications between two skinned surfaces. They may appear quickly, such as those arising iatrogenus or post-surgery or may be insidious, such as those malignant, inflammatory or radice.

The Internal Intestinal Fistulas are communications between the segments of the gastrointestinal tract and the adjacent organs or preformed cavities (hydatic cyst, abscess, etc.). The preformed cavities are not having tissue (epitalizate).

The External Intestinal Fistulas are viscera-parietal wounds, which are allowing the drainage of the digestive content (maybe the alimentary one), directly to the outside. The exteriorization may take place on the surface of the skin or in the vagina. Their diagnosis is

easy to establish at the moment of the eruption of the digestive content on the drain tube, on the wound or on the hole of the drainage tubes, after their extraction.

THE HEALING IN THE DIGESTIVE TRACT

For didactic purpose, the healing process can be divided in three phases which are overlapping:

1. The hemostasis and the inflammation;
2. The proliferation phase;
3. The maturation or the remodeling phase.

The Hemostatis and the Inflammation

The inflammatory phase is crucial in the healing process. The immediate response at the aggression is vascular. There is a short period of venous-construction for the blood vessels next to the wound; after this, the venous-dilatation takes place, followed by the increase of the capillary permeability, together with the enlargement of the spaces between the endothelial cells.

The veins' injury is bringing together the sub-endothelial collagen with the platelets, which determines their aggregation and the activation of the intrinsic pathway of coagulation: the release of cytokines and growth factors from the alpha granules (platelet derived growth factor, transforming growth factor beta, platelet activation factor, fibronectin and serotonin). The locally formed fibrin is putting together the edges of the wound and serves as a support for the invading cells: neutrophils, monocytes, fibroblasts, endothelial cells. The poor formation of the rennet, found in blood deficiency of factor XIII (fibrin stabilizing factor) is associated with the impaired wound healing. In this first phase of the wounds' healing, the wound is devoid of mechanical resistance, the edges of the wound being maintained acolate by the suture material.

The Proliferation Phase (The Fibroblastic Phase)

After 4-5 days after the surgery, it begins the second phase of the healing process. The fibroblasts and the endothelia; cells are becoming the main cells of this healing phase. The fibroblasts are migrating on the wound from the surrounding tissues. The endothelial cells are proliferating from the veins surrounding the wound and they are forming new capillaries through the process known as angiogenesis. The proliferation of the fibroblasts and of the endothelial cells is triggered by the growth factors and by the cytokines released, mainly, by the platelets and macrophages. At the end of this phase, the wound is covered by a grain tissue, with very much blood, which contains neocapillaries, fibroblasts, macrophages and mast cells.

The Maturation and the Remodeling

At the end of this last phase, the wound is becoming almost non-cellular, with few inflammatory cells, round cells or giant cells of foreign body around the suture material and relatively non- vascular.

The remodeling of the collagen it's taking place, together with the orientation of the fibers along the lines of tension and the degradation of the others. However, the scar will never be able to acquire the aspect of the normal tissue and, consequently, the strength of the scar tissue will always be smaller than the normal one's.

The length of this phase is uncertain; it may be possible to never come to an end.

FACTORS THAT ARE AFFECTING THE HEALING ON THE GASTROINTESTINAL TRACT

The factors with an adverse role in the process of digestive sutures' healing are classified in two categories: ***local factors***, which are affecting the digestive reconstruction locally, and ***general factors*** (systemic), which consist of systemic abnormalities with a remote effect on the sutures.

Local Factors Involved in the Healing Process

The local factors with a role in the failure of the digestive sutures are: the surgical technique; the vascularization; the mechanical stress; the suture material; the performing technique of the anastomosis; the irradiation; the infection; the local decontamination; the decompression stoma; the protection stoma; the perianastomotic drainage; the intraperitoneal chemotherapy and the neoplastic infiltration of the edges to be anastomosied.

Systemic Factors Involved in the Healing Process

The systemic (general) factors considered to be involved in the wounds' healing process are: the age, the malnutrition, the alcohol and the smoking, the trauma, the hipovolemia, the shock, the anemia, the blood transfusions, the diabetes, the malignant diseases, the uremia, the jaundice, the corticoids therapy, the nesteroid anti-inflamatories drugs, the cytotoxic drugs, the anesthetics and the anti-metabolic drugs.

THE DIAGNOSIS OF THE POSTOPERATIVE DIGESTIVE FISTULLAS

The necessary investigations needed for one postoperative digestive fistula patient's evaluation, must respond to the following queries:

1. Which is the main disease, which is its extension area and what is the status of the digestive tract next to the fistula?
2. Which is the anatomy of the fistulous route?
3. Which are the metabolic and nutritional consequences of the fistula and how they are supposed to be corrected?
4. How severe is the related infection and how it should be treated?
5. Which are the prognostic and the probability of the spontaneous closure of the fistula?

1. The Clinical Evaluation

The diagnosis of the external digestive fistula is, usually, easy to be established. The postoperative fistula may become apparent in few hours or few days after the surgery. The apparition of the fistula is usually preceded by prodroms, being characterized by few signs and also by some local and general symptoms.

The general signs may include: fever over 38*C, trembling, tachycardia, oligury, the alteration of the general status, pleura-pulmonary manifestations, congestive facies, pale or cyanotic etc.

The local signs (functional) are present almost as a rule. Clinically, it is noticing the persistence or the reoccurrence of the dynamic illeus after the temporary resuming of the peristaltic. Most frequently it has been observed the extension or the reoccurrence of the gastric stasis. In other cases, the intestinal transit stops after its initial restoration or it may occur earlier than expected through diarrheal seats. The patient is usually complaining of deep pain, having as starting point the surgery area but with diffusion trend, feeling of heaviness in the pelvis and flatulence.

2. ***Paraclinic Investigations***: Radiologic investigations, endoscopy, biopsy, abdominal echo, abdominal computerized tomography, scintigraphy, abdominal MRI.

THE TREATMENT OF POSTOPERATIVE INTESTINAL FISTULAS

The therapeutic objectives regarding the postoperative digestive fistulas are the closure of the fistula and the rebalance of the digestive continuity by non-surgical and/or surgical means.

The evolution of a patient suffering by postoperative digestive fistula may be divided in five sequential phases, which are overlapping. The definition of these phases is extremely useful to the doctor in treating this dreaded complication.

Phase 1 **– The recognition of the fistula and the rebalance of the patient** – in the first 24 – 48 hrs

The hydro-electrolytic rebalance
The anemia's correction
The drainage of the septic collections
The restoration of the colloid-osmotic pressure
The establishment of the nutritional support
The control of the fistula's drainage
The establishment of the skin's caring

Phase 2 **– Investigations** – the first 7-10 days

Clinical exam
Lab exams
Radiologic exams – The fistulography is usually indicated after 7-10 days
Echo
Computerized tomography
Scintigraphy
Digestive endoscopy
Histopathological exam
Exploratory laparotomy

Phase 3 **– The decision** – 7 to 10 days and 4 to 6 weeks

Phase 4 **– Permanent therapy** – in case of uncertain closure or after 4-6 weeks

- Surgical treatment
- Radiologic treatment
- Endoscopic treatment
- Percutaneous treatment

Phase 5 **– The healing** – 5 to 10 days from closure

THE SPECIAL PART
PERSONAL CONTRIBUTIONS

MOTIVATION AND OBJECTIVES

The high mortality caused by this severe postoperative complication, as well as its forensic implications made me analyze the apparition causes of the intestinal fistula on the nets and on the digestive anastomosis, to draw a management plan for an intestinal fistula and to propose an original treatment method which I hope to be borrowed and sustained by the later studies and by the surgical practice also.

The pursued objectives inside the special part are the following:

1. The classification of the types of postoperative intestinal fistulas encountered;
2. The elaboration of a computerized database for processing all the data regarding the patients who developed postoperative digestive fistulas;
3. Reporting the incidence of occurrence of the various postoperative digestive fistulas at the total amount of surgeries performed during the period under review and resulting in sutures or digestive anastomosis potentially generators of fistulas;
4. The analysis of the risk factors related to the occurrence of the various postoperative digestive fistula types;
5. The analysis of the diagnose methods related to the fistula's type;
6. The analysis and definition of the therapeutic attitude related to the appearance of the postoperative digestive fistula;
7. The analysis of the complications related to the occurrence of the digestive fistula;
8. The reporting of the obtained therapeutic results.

MATERIAL AND METHOD

The study is retrospective and it was performed **during a period of 6 years (1.01.2006-31.12.2011)**, inside the Second Surgery Clinic of the County Emergency Clinical Hospital of Constanta.

The batch of study was comprised of 98 patients suffering from postoperative intestinal fistulas, hospitalized between 1.01.2006 and 31.12.2011.

The criteria for the patients' selection. Have been introduced in this study all the patients who developed intestinal fistulas after surgical interventions performed not only inside the clinic, but also in other sanitary units. There have not been taken into study others but the patients who developed fistula to the digestive sutures. Were excluded those with spontaneous external intestinal fistulas or with fistulas occurred through gastrointestinal efractions which were not detected during the surgery.

For 8 patients I have performed the percutaneous occlusion with complex prosthesis. The method of percutaneous occlusion with complex prosthesis, applied on 2 patients with gastro-duodenal fistula, on 4 patients with entero-enteral fistula and on 2 patients with entero-colic fistula, it represents a personal original method. The complex prosthesis has two sides, one made of polypropylene which is orientated towards outside and one made of collagen which is touching the fistulous hole; it lacks of toxicity and it is quite cheap.

The percutaneous occlusion with complex prosthesis has been performed for the patients who did not presented any sign of dynamic ileus nor of peritoneal irritation. The prosthesis has been applied over the entero-cutaneous fistula, being orientated with the propylene side towards outside and with the collagen one towards the fistulous hole. The edges of the prosthesis have been fixed with absorbable threads by the tissues next to the fistulous hole, above the prosthesis has been placed a drainage tube in order to verify the sealing of the prosthesis. Finally, it has been applied a compressive dressing.

In some cases, besides the prosthesis, I have also added an antibiotic with local effect (Rifampicină, Tetraciclină, Metronidazol) as powder or liquid.

The prosthesis is resistant to the enzymatic action of digestive juices. Collagen has proven to be the most resistant biomaterial to the action of digestive liquids.

Both the doctor and the patient were informed of the treatment method, explaining them that there are currently no similar clinical trials and that this method may not automatically lead to healing. The patients have agreed to participate to the study, fully understanding the risks associated with the procedure and they have respected the treatment given.

For the success of the method is essential to be obtained the complete obturation of the fistulous route and then to be applied a pressure over the prosthesis through the brace; if possible, is best to fix a drain tube on top of the prosthesis.

Collection of the data: The collection, the processing and the interpretation of the data obtained through the analysis of these patients have been greatly facilitated by the implementation of a computerized database. This database is of its own design and it has been built specifically for this purpose, using Microsoft Access software.

The processing of the information corresponded to the following parts:

- Collection of the material - for each case it has been implemented a *pattern form* (ANNEX 1)
- It has been also implemented *the quantitative and the qualitative capitalization of the collected data*

The submission of the information to be analyzed has been carried out as follows:

- The data were observed complexly, based on several grouping' characteristics (the data processed in records), having as objective the correlative study of the research's goal

The conducting of the research showed the following **characteristics**:

- *The volume delimitation* of the studied community: a number of 98 cases
- *The selection criteria* of the subjects was represented by the presence of a postoperative intestinal fistula
- The research has been *complete*, being studied the entire batch from the community above mentioned
- *The delineation in time*: research performed between 2006 and 2011

The mathematical processing of experimental data

The data were systematized as *tables* related to the experiment (batches).

The data' presentation has been made through *graphic representations* as "*column" and "sectoral"* respecting the existing scientific requirements related. The obtained values have been considered normally distributed, by using *the Gauss distribution, around a mean value.*

For each parameter mathematically quantifiable have been determinate the following characteristic values:

a. **mean value**:

mean_value= $\frac{1}{n}\sum_{i=1}^{n}$ ⟦measured value⟧

where: n- number of determinations

i -the order of delimitation

b. standard deviation of values:

$$S.D. = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(mean\ value - measured\ value)^2}$$

In order to settle the significance of the changes of the values of some sizes belonging to the various slots, it have been used:

test „t" – Student
test "χ^2" and
„ANOVA"test - *Analysis of Variance*

RESULTS

The studied batch has been comprised by 98 patients, presenting at least a postoperative intestinal fistula. Those have been recruited over a 6 years period (01.01.2006-31.12.2011) from an amount of 1893 operated patients who have been surged on the digestive tract during this period of time. The percentage of cases of postoperative intestinal fistula represents 5,18% of total of cases operated, value which is standing between those reported in the literature.

1. ***The distribution of the intestinal fistulas for the operated patients, depending on the surgery performed***

Considering the 1893 operations on the digestive tract, in 112 caseshave been performed eso-enteral anastomosis, in 642 cases have been performed gastro-duodenal / enteral anastomosis, in 392 cases have been performed entero-enteral anastomosis and in 747 cases – enetro-colic / entero-rectal anastomosis.

The 112 eso-enteral anastomosis have been followed by eso-enteral fistulas for 14 cases (12,5%). After the 42 gastro-duodenal / enteral anastomosis, have occured 29 gastro-duodenal fistulas (4,52%). A number of 22 entero-enteral fistulas (5,61%) have occured after the 392 surgeries on the small intestine. The 747 entero-colic and entero-rectal anastomosis have been followed by 33 anastomotic fistulas (4,42%).

The distribution of the intestinal fistulas for the operated patients, depending on the surgery performed

Surgery type	No of surgeries	No of fistulas	%
Eso-enteral anastomosis	112	14	12,5%
Gstro-duodenal/enteral anastomosis	642	29	4,52%
Entero-enteral anastomosis	392	22	5,61%
Entero-colic,entero-rectal anastomosis	747	33	4,42%
Total	**1893**	**98**	**5,18%**

2. ***Gender structure of the studied batch***

Of the 98 patients with postoperative intestinal fistula, 32 were women and 66 were men. Women/man ratio was 1 / 2, 06 at the studied group.

The structure of the studied batch according to gender

Gender	No	%
Female	32	32,65%
Male	66	67,35%
Total	99	100%

3. ***The distribution of the intestinal fistula depending on its localization***

Of the 98 postoperative intestinal fistulas developed by the studied patients, 14 (14,28%) fistulas have occurred on eso-enteral anastomosis, 29 (29,59%) were the result of some gastro-duodenal anastomosis, 22 (22,44%) have occurred after entero-enteral anastomosis and 33 (33,67%) post entero-colic and entero-rectal anastomosis.

The distribution of the intestinal fistulas depending on their localization

The anatomical-clinic type of fistula	***No. of patients***	***Percentage %***
Eso-enteral fistula	14	14,28%
Gastro-duodenal/enteral fistula	29	29,59%
Entero-enteral fistula	22	22,44%
Entero-colic/rectal fistula	33	33,67%
Total	98	100%

4. The group' structure according de age and gender

Of the 98 patients, 2 were less than 20, 11 were around 20-30; 13 patients were in the 30-40 groups; 17 were around 40-50; 20 were around 40-50; 20 were around 50-60; 20 were between 60-70 years of age and 15 were over 70.

The group' structure according de age and gender

Gender	**Age**						
	<20	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**	**>70 yrs**
Females	0	4	4	6	7	6	5
Males	2	7	9	11	13	14	10
Total	**2**	**11**	**13**	**17**	**20**	**20**	**15**
%	2,04%	11,22%	13,27%	17,35%	20,41%	20,41%	15,30%

5. The distribution of the systemic propensity factors in the postoperative intestinal fistulas

Regarding the 98 postoperative intestinal fistulas, I have noticed the presence of the following systemic propensity factors: malnutrition for 26 of them (26,53%), high blood pressure in 27 cases (27,55%), vascular perpheral in 8 cases (8,16%), smoking in 12 cases (12,24%), diabetes in 8 cases (8,16%), obesity in 6 cases (6,12%), anemia in 46 cases (46,94%), the blood transfusions as well as the malignancy in 61 cases (62,24%), sepsis in 24 patients (24,49%), chronic renal insufficiency in 1 case (1,02%), jaundice and cirrhosis in 2 cases (2,04%), preoperative irradiation in 7 cases (7,14%), corticoid-therapy in 3 cases (3,06%), intestinal inflammatory disease in 7 cases (7,14%), pulmonary diseases in 8 cases (8,16%).

The distribution of the systemic propensity factors in the postoperative intestinal fistulas

Propensity factor	**No of cases /98 fistulas**	**Percentage**
Malignancy	61	62,24%
Blood transfusions	61	62,24%
Anemia	46	46,94%
High blood pressure	27	27,55%
Malnutrition	26	26,53%
Peritonitis/sepsis	24	24,49%
Smoking	12	12,24%
Diabetes	8	8,16%
Vascular perpheral	8	8,16%
Pulmonary diseases	8	8,16%
Intestinal inflammatory disease	7	7,14%
Preoperative chemiotherapy	7	7,14%
Preoperative irradiation	7	7,14%
Obesity	6	6,12%
Corticoid-therapy	3	3,06%
Jandice/cirrhosis	2	2,04%
Chronic renal insufficiency	1	1,02%

6. The distribution of the postoperative intestinal fistulas according to the malignancy of the lesions

Of the 98 postoperative intestinal fistulas I have studied, 61 (62,24%) have occurred after surgeries related to the treatment of a certain malignant disease.

The distribution of the postoperative intestinal fistulas according to the malignancy of the lesions

Malignancy of lesions	No of cases	Percentage
Present	61	62,24%
Absent	37	37.76%
Total	**98**	**100%**

7. The emergency / programmed surgical treatment

Our study has shown that the intestinal fistula has occurred in 66 patients (67,65%), which have been scheduled for operation , compared with 32 patients which have been urgently operated (32,65%). The small number of fistulas occurred after the emergency interventions is explained by the fact that those patients do not have the advantage of the first-time anastomosis. Instead, is preferred an iliac – anus which is reducing the risk of the fistulas' occurrence.

The distribution of the enteral fistulas according to the emergency surgery

Surgery	No of patients	Percentage
On emmergency	44	44,9%
Scheduled	54	55,1%
Total	**98**	**100%**

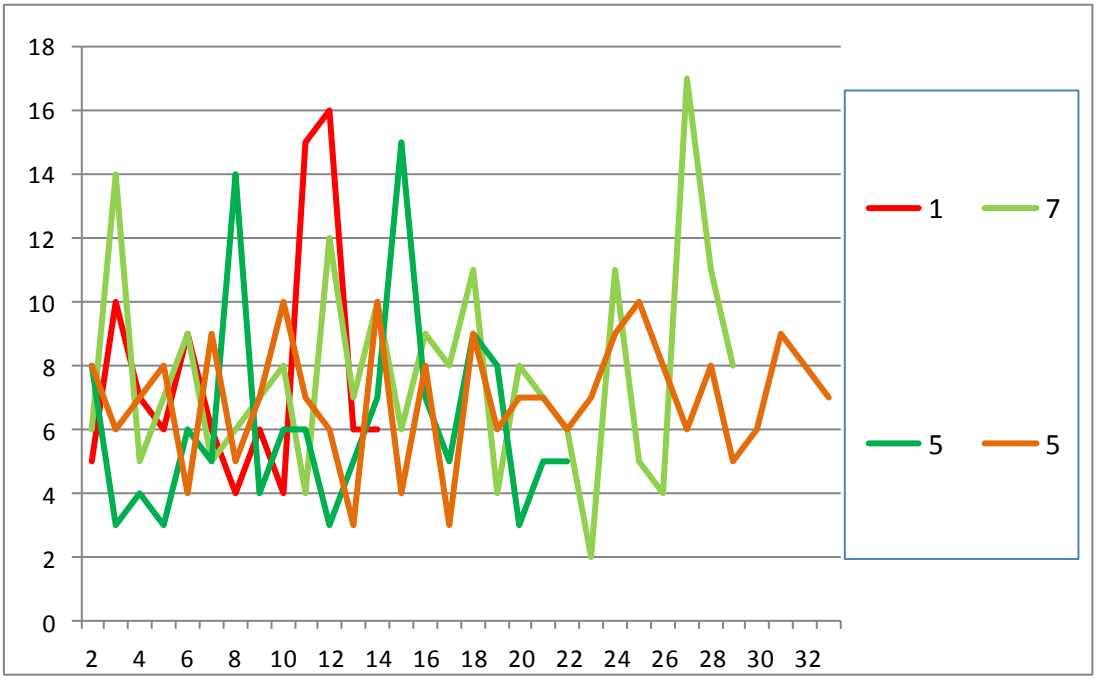
8. The clinical diagnosis, the debut of the intestinal fistulas

The debut of the eso-enteral fistulas took place approx. on the 7, 21 day with average between day 1 and day 16, of the gastro-duodenal and gastro-enteral fistulas around the day 7, 72 with average between day 3 and day 15 and the entero-colic and entero-rectal ones have been diagnosed in day 6,91 with average between day 3 and day 10. These conclusions are warning us regarding the risks resulting from the early discharging of patients with digestive tube surgeries. Most of the intestinal fistulas were able being diagnosed by the physical exam of the patient. Therefore, at 82 (83, 67%) of the 98 studied patients the diagnosis was obviously a clinical one.

The distribution of the clinic diagnosis in the intestinal fistulas

Clinical diagnosis	No of patients	Percentage
Positive	82	83,67%
Negative	16	16,32%
Total	**98**	**100%**

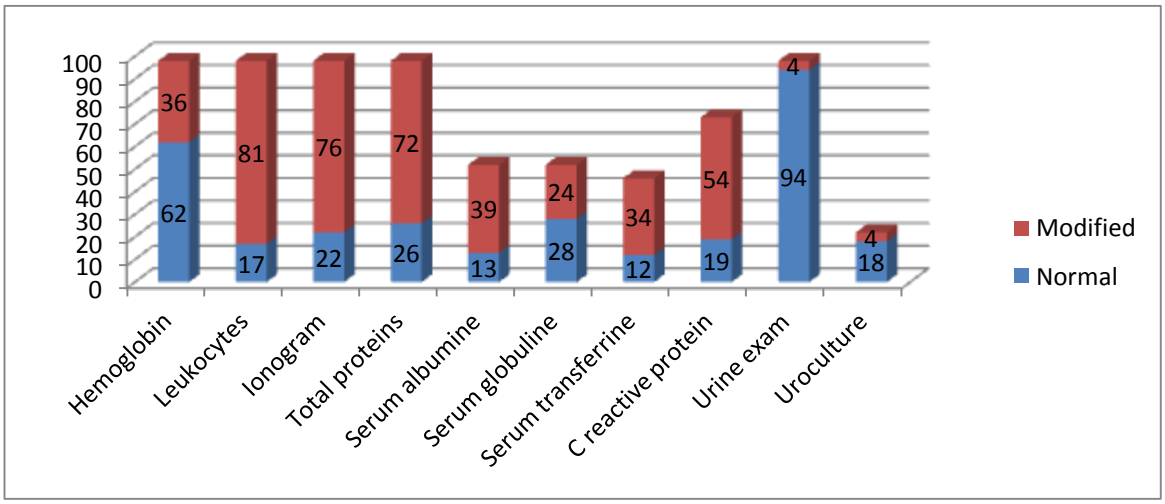
The distribution of the fistula's debut related to the location of the fistula per case



9. The biological diagnosis

The biological parameters which have been altered on the patients with intestinal fistula were: hemoglobin, leukocytes, ionogram (sodium, potassium, chloride), total protein, serum albumin, serum globulin, serum transferrin (low level of which is a prediction factor for the lack of healing) and C-reactive protein (whose level can be increased).

The distribution of the changes of biological parameters in the intestinal fistulas



10. Laboratory diagnosis

In uncertain circumstances we may use not only the lab analysis but also the imaging investigation. The abdominal radiography "on empty" has been practiced for 27 patients (27,55%), ultrasound has been practiced for 81 (82,65%), computerized tomography for 87 (88,77%), barium eso-gastroduodenal x-ray for 4 patients, irigography for 2 patients, barium transit for 2 patients, fistulography for 8 patients, MRI for 11 patients, oral administration of non-absorbable markers for 15 patients and cystoscopy for 1 patient.

The distribution of lab/imagistic investigations in the intestinal fistulas

Investigation	No of patients	Percentage
Simple abdominal x-ray	27	27,55%
Abdominal ultrasound	81	82,65%
Abdominal computerized tomography	87	88,77%
Eso-gastroduodenal x-ray	4	4,08%
Irigography	2	2,04%
Barium transit	2	2,04%
Fistulography	8	8,16%
Non-absorbable markers	15	15,30%
MRI	11	11,22%
Cystoscopy	1	1,02%

11. The treatment of the intestinal fistulas

Of the 98 studied patients, 70 (71,43) have been surgically treated and 28 (28,57%) have been treated conservative.

The distribution of the treatment of intestinal fistulas

The treatment	No of patient	Percentage
Surgical	70	71,43%
Conservative	28	28,57%
Total	**98**	**100%**

11.1. The conservative treatment of the intestinal fistulas

The methods of conservative treatment

For the conservative treatment of the intestinal fistulas I have used for methods: the tenting for 10 patients (35,71%), aspiration drainage for 8 patients (28,57%), the Gelaspon application for 2 patients (7,14%) and the coverage of the fistulous hole with two-sided prosthesis (polypropylene and collagen), which has been practiced for 8 patients (28,57%).

The distribution of the methods of conservative treatment of intestinal fistulas

Conservative treatment	No of patients	Percentage
Tenting	10	35,71%
Aspiration drainage	8	28,57%
Gelaspon application	2	7,14%
Two-sided prosthesis	8	28,57%
Total	**28**	**100%**

11.2. ***The nutrition of the patients with intestinal fistulas***

The parenteral nutrition was practiced in 22 Patients (22,44%) out of the 98 with digestive fistulas. In 24 patients it has been used the enteral nutrition (24,49%) while 10 patients (10,20%) have benefitted by both enteral and parenteral nutrition.

The distribution of the nutrition for the intestinal fistula patients

Nutrition	No of patients	Percentage
Enteral	24	24,49%
Parenteral	22	22,44%
Enteral+parenteral	10	10,20%
Oral	42	42,85%
Total	**98**	**100%**

11.3. Sandostatin administration for the intestinal fistula's patients

In order to reduce the digestive secretions it has been administrated Sandostatin in 31 patients (31,63%); for 18 the recovery has been achieved through conservative treatment, the other 13 needed surgery.

The distribution of Sandostatin's administration related to the localization of the intestinal fistula

Fistula's localization	**Total**	**Sandostatin administration**				**No of patients**	**Percentage**
Esoenteral	14	Yes				0	0%
		No				14	100%
Gastroduodenal/enteral	29	Yes				13	44,82%
		No				16	55,17%
Entero-enteral	22	Yes				12	54,54%
		No				10	45,45%
Enterocolic/rectal	33	Yes				6	18,18%
		No				27	81,81%
Total	**98**	**YES**		**NO**			**100%**
		No	**%**	**No**	**%**		
		31	**31,63%**	**67**	**68,36**		

11.4. Surgical treatment of the intestinal fistulas

11.4.1. The surgical re-intervention criteria

The surgical re-intervention criteria have been represented by: the alteration of the general status (65 patients - 92.85%), toxic-infectious general signs (fever, trembling)- in 58 patients (82.85%), dispnea with polipnea (34 patients – 48,57%), constant tachycardia (46 patients – 65,71%), cardio-circulatory instability (29 patients – 41.42%), low blood pressure (19 patients – 27,14%), oligury (48 patients – 68,57%), diarrhea (24 patients – 34,28%), vomit (18 patients – 24,71%), high gastric aspiration (52 patients – 74,28%), absence of intestinal transit (54 patient – 77,14%), superior digestive bleeding (12 patients – 17,14%), psychomotor agitation (9 patients – 12,85%), confusion (11 patients – 15,71%), drowsiness (26 patients – 37,14%), local signs of peritonitis or occlusion (47 patients – 67,14%), externalization of digestive liquid through the drain tube (53 patients – 75,71 %), the festering of the operation area (26 patients – 34,14%), evisceration of the operation lesion (12 patients – 17,14%), biological changes (leukocytosis, diminution of the platelet number, diminution of the phosphatemia, the growth of the urea and of serum creatinine, electrolytic and acido-basic disturbances, changes of the coagulation diagram – 87 patients (97,14%).

The distribution of the surgical re-intervention criteria in the intestinal fistulas

Re-intervention criteria	**No of patients**	**Percentage**
Alteration of general condition	65	92.85%
General toxic-infectious signs	58	82.85%
Dispnea with polipnea	34	48.57%
Tachycardia	46	65.71%
Cardio-circulatory instability	29	41.42%
Low blood pressure	19	27.14%
Oligury	48	68.57%
Diarrhea	24	34.28%
Vomit	18	25.71%

High gastric aspiration	52	74.28%
Absence of intestinal transit	54	77.14%
Superior digestive bleeding	12	17.14%
Psychomotor agitation	9	12.85%
Confusion	11	15.71%
Drowsiness	26	37.14%
Peritonitis or occlusion	47	67.14%
Digestive liquid through the drain tube	53	75.71%
The festering of the operation area	26	37.14%
Evisceration	12	17.14%
Biological changes	68	97.14%

12. EVOLUTION, HEALING AND MORTALITY

During the present study, the healing has been achieved for all the postoperative digestive fistulas in various percentages. Out of the studied batch, the healing process has been encountered in 62 patients (62, 37%), while 36 patients have died (36, 73%).

12.1 The mortality related to the fistula's localization

The highest mortality was noticed at the patients with esophageal fistulas, 9 out of 14 patients (64,28%), followed by the one in which the patients presented gastro duodenal/enthrall fistulas, 11 of 29 patients (37,93%). The third place belongs to the mortality related to the enthrall fistulas, 7 out of 22 patients (31,81%), and the lower mortality has been encountered for the patients with entero-colic/rectal fistulas 9 out of 33 patients (27,28%).

The mortality related to the fistula's localization

Fistula's localization	***No of patients***	***Healing***		***Mortality***	
		No	***Percentage***	***No***	***Percentage***
Eso-enthrall fistula	14	5	35.71%	9	64.28%
Gastroduodenal/enthrall fistula	29	18	62.07%	11	37.93%
Entero-enthrall fistula	22	15	68.18%	7	31.81%
Entero-colic/rectal fistula	33	24	72.72	9	27.28%
Total of fistulas	**98**	**62**	**63,27**	**36**	**36,73%**

12.2. The mortality related to the type of treatment

For all of types of the postoperative digestive fistulas encountered during the present study, the mortality was higher if the surgical intervention was needed, excepting the entero-colic fistulas where the mortality reached a higher level under the conservative treatment.
Therefore, it has been concluded that, for the studied batch, the conservative attitude has led to a higher percentage of cases ended in exitus, 12 out of 28 patients (42,86%), compared to the demises percentage registered for the patients surgically treated, 25 out of 70 (35,71%).

The distribution of mortality related to the type of treatment and to the fistulas localization

Fistulas localization	***No of patients***	***Treatment***		***Healing***		***Mortality***	
				No	***%***	***No***	***%***
Eso-enthrall fistula	14	Conservative	8	4	50%	4	50%
		Surgical	6	1	16,67%	5	83,33%
Gastroduodenal/enthrall fistula	29	Conservative	8	7	87,5%	1	12,5%
		Surgical	21	11	52,38%	10	47,61%
Entero-enthrall fistula	22	Conservative	5	4	80%	1	20%
		Surgical	17	11	64,7%	6	35,3%
Entero-colic/rectal fistula	33	Conservative	7	2	28,57%	5	71,42%
		Surgical	26	22	84,61%	4	15,39%
Total	**98**	**Conservative**	**28**	**17**	**60,71%**	**11**	**39,39%**
		Surgical	**70**	**45**	**64,29%**	**25**	**35,71%**

12.3. The mortality related to the fistula's type and the gender of the patient

The evolution of the mortality related to the gender distribution has registered a higher frequency to men, 23 patients out of 36 (63,89%), comparing to women 13 patients out of 36 (36,11%), according to the percentage of cases whose evolution was a favorable one, the healing being encountered more frequently in man, 43 out of 62 patients (69,35%).

Regarding the repartition of the mortality related to gender and to the fistula's type, it has been concluded that there is a higher frequency in man in all cases, excepting the entero-colic/rectal fistulas, where the frequency is higher in women (55,55%).

The distribution of the intestinal fistulas for the operated patients related to mortality/healing/gender

Fistulas	Eso-enthrall		Gastro-duodenal/ enthrall		Entero-enthrall		Entero-colic/ rectal		Total	
	14		29		22		33		98	
Dead	9 (64,28%)		11 (37,93%)		7 (31,81%)		9 (27,27%)		36 (36,73%)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
	7	2	8	3	4	3	4	5	23	13
Healed	5 (35,71%)		18 (62,07%)		15 (68,18%)		24 (72,72%)		62 (63,26%)	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
	4	1	15	3	8	7	16	8	43	19

12.4. The mortality related to the fistula type and to the age of patient

The mortality prevailed in elderly patients. Therefore, the age is an adverse prognostic factor for the further evolution of the patient. In the studied group, mortality occurred in 55% of the patients aged between 50-70 and in 53, 34% aged over 70, compared with the 18,18 % mortality rate in patients aged between 20-30, i.e. 30-40.

The distribution of the enthrall fistulas for the operated patients related to mortality/healing/gender

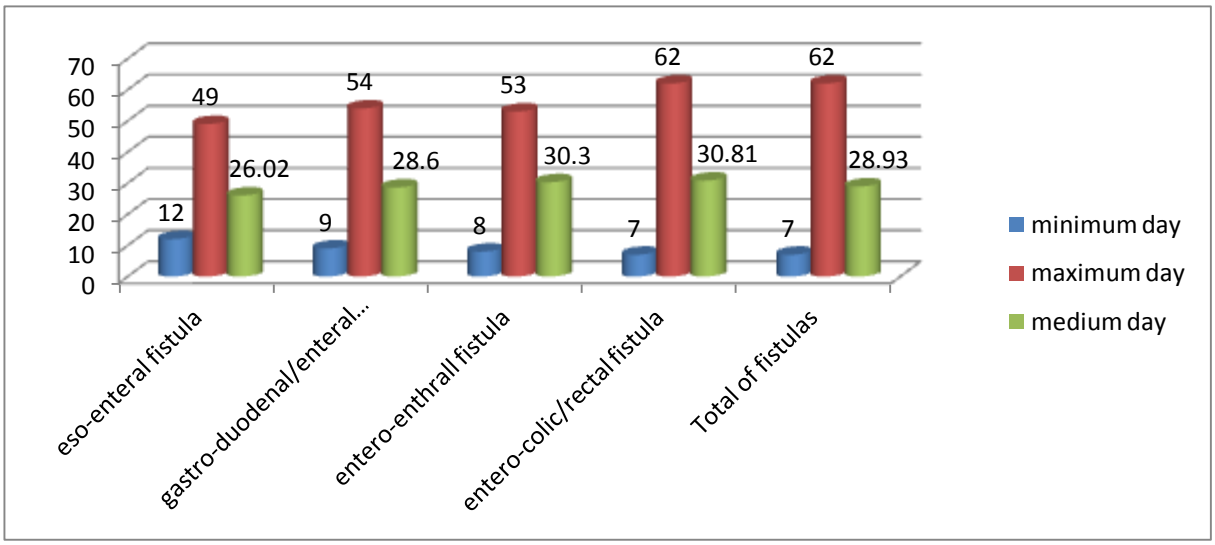
Age		<20		20-30		30-40		40-50		50-60		60-70		>70	
TOTAL		**2**		**11**		**13**		**17**		**20**		**20**		**15**	
Evolution		dead	healed	dead	healed	dead	healed	dead	healed	dead	healed	dead	healed	dead	healed
fistula	no														
Eso-enthrall	**14**	0	0	2	1	2	0	0	1	2	1	2	1	1	1
Gastro-duodenal/ enthrall	**29**	0	1	0	4	0	6	2	3	4	2	3	1	2	1
Entero-enthrall	**22**	0	1	0	2	0	2	0	5	2	3	3	1	2	1
Entero-colic/rectal	**33**	0	0	0	2	0	3	1	5	3	3	3	6	2	5
TOTAL	**98**	0	2	2	9	2	11	3	14	11	9	11	9	7	8
	Percentage	0%	100%	18,18%	81,82%	15,38%	84,62%	17,64%	82,36%	55%	45%	55%	45%	46,66%	53,34%

13. THE HOSPITALIZATION LENGTH

The distribution of enthrall fistula patients related to the hospitalization's lenght

The mean average of the hospitalization length at the studied group was of 28,93 days, with minimum hospitalization days of 7 and maximum of 62. This period is significantly lower than the one mentioned by the related literature (43 days). The shortest hospitalization period was noticed for the gastro-duodenal-enthrall fistulas (26,02 days) and the longest one for the entero-colic/rectal fistulas (30,81 days).

The distribution of hospitalization days related to the type of treatment and to the localization of fistula



DISCUSSIONS

The management of the patient with postoperative intestinal fistula is multidisciplinary, involving the surgeon, the anesthesiologist, the radiologist, the gastroenterologist, the psychotherapist, the stomatherapist etc. The care of the patient with intestinal fistula requires significant material resources, specialized personnel, experienced and dedicated, a prolonged period of treatment. The concentration of specialized human resources, as well as the adequate material and financial resources in some specific centers, among them being also the Surgery Clinic from Constanta, lead us to affirm that is advisable that in Romania all the patients suffering from these postoperative complications to be guided to those centers.

The stages of the intestinal fistulas' treatment:
1.Patient stabilization;
2.Investigations;
3.Decision;
4.Permanent therapy;
5.The cure

Patient stabilization: For the new patients, this stage lasted between 24-48 hrs. During this period, it has been practiced: hydroelectrolythical rebalancing; anemia correction; the drainage of the septic collections; the restoration of colloid-oncotic pressure; the establishment of nutritional support; fistula drainage's control; the establishment of skin caring; antibiotic-therapy; the establishment of measures meant to decrease the digestive secretions volume; the psycho-emotional support of the patient.

The hydroelectrolythical rebalancing has been performed by the administration of cristaloid solutions, usually 3000-4000 ml, in order to replace fluid losses resulting from their seizure in the lumen and intestinal wall, or from deletions. *Anemia* has been corrected through the administration of whole blood or red blood cell mass. *Drainage of the obvious abscesses* was performed before the installation of central venous catheters as it is known the risk of infection when using them. Low albumin value has been corrected by administering exogenous albumin until reaching the serum level of 5mg/l. The fistula drainage control has been achieved by the aspirate drainage of the fistula (for the large flow fistulas) or by fitting a content bag (for the reduce flow fistulas); both of those allowed the exact estimation of the drained liquid, therefore the hydroelectrolithical losses were correctly evaluated and replaced. *The skin care* was based on the implementation of a modality for collecting the secretion and on the use of skin savers. These preparations have prevented the tissue maceration by hinder their contact with the fistulous content or by neutralizing the secretions. *The establishment of nutritional support*. The parenterall nutrition was applied on 22 patients (22,44%) diagnosed with intestinal fistula and enteral nutrition on 24 patients (24,49%). 10 patients (10,20%) have benefit by both enteral and parenteral nutrition. 42 patients (42,85%) have benefit of oral nutrition only.

The parenteral nutrition has not been administrated on a larger number of patients due to financial-administrative reasons also, the high costs related to those being well known. *The measures for decreasing the volume of the digestive* secretions have been established after the hydroelectrolythic control of the fistula's extern drainage. For this purpose have been used the antagonists of histamine receptors (for all patients) and Ocreotide.

Antibiotic therapy. In various circumstances has been used the antibiotic therapy in all patients: as treatment for cellulites or for the infection which is spreading on the tissue area, in 5 days from the debut of the fistula; for the blood bacteria confirmed by blood

analysis, which may occur if the fistula is accompanying an abscess; the presence of sepsis; prophylaxis in case of surgical interventions.

The emotional support of the patient. The applied treatment must be permanently explained to the patient and to his family also, in order to obtain his compliance and his entire faith in the medical team.

Investigations. In the present study, we have done our best to clarify through investigations the following issues: if there is digestive continuity on the fistula area or if there is a total detachment; if the fistula is terminal or lateral; if there are any abscesses and if those are communicating with the fistulous route; if the condition of the digestive tube near the fistula is affected (lesion, stenosis, inflammation); if there is an obstruction down the fistula; deciding the length of the part from the digestive tube to which is belonging the fistula; deciding the fistula's cause; if the length of the route is longer than 2cm.; if the digestive flaw is longer than 1 cm.

The decision. The therapeutic goals regarding the postoperative intestinal fistulas are closure of the fistula and the restoration of the digestive continuity by conservative means and/or surgical ones. Most often, those are accomplished spontaneously. Spontaneous healing is not possible except one third of the patients with etiologic, anatomic or nutritional adverse conditions. Even in the absence of any adverse factor, it is quite difficult to predict the spontaneous closure of the fistule and to decide the type of the treatment: conservative or surgical.

Essentially, the goals of the management applied to the patient who developed postoperative intestinal fistula are defined by the British acronym "SNAP" – sepsis, nutrition, anatomy, procedure (therapeutic).

Emergency re-intervention criteria

The decision of the emergency re-intervention is difficult to take due to the unsteady signs of certainty for the postoperative peritonitis. Although the general signes are usually early and common, the digestive functional signs are sometimes hard to interpret. M. Guivare'h and contrib. were writing in 1977: " If the abdominal signs, familiar to the surgeon, are unsteady and late, the infectious general signs, familiar to the resuscitation doctor, are early."

The team formed by the surgeon and the anesthetist must work in order that the decision to re-intervene must be taken in max 24 hrs.

The emergency surgical reintervention criteria are:

-**the alteration of general condition**, with toxic-infectious general signs: fever, trembling

- **the occurrence of general signs of gravity**. Sometimes, one or more viscera insufficiencies are taken over the clinical image, in the absence of the abdominal signs.

- *Respiratory*: dispnea with polipnea (>20 breaths /min), necessity of oxygen-therapy through the mask, late necessity of ventilation support. The polipnea, accompanied by respiratory alkalosis, which are unable being influenced by painkillers or by oxygen's administration, are early signs of postoperative peritonitis. The etiology of polipnea should be assigned to the endotoxin.
- *Cardio-vascular*: constant tachycardia, with raised values (>120 beats/min), which cannot be related to another reason (bleeding, heart disease), myocardial dysfunction signs and cardio-circulatory instability, which are claiming the administration of inotrop positive substances and arteropressures medicines. Often it may be noticed "warm" low blood pressure and well palpable pulse, but low, as signs of a raised cardiac debit and of a low peripheral resistance, which determines a drop in the medium blood pressure.
- *Reno-urinary*: oligury, sometimes accompanied by a nitrogenous retention

- *Digestive tract*: diarrhea may be the only sign of a sub-mezocolic peritonitis; nausea, vomit, high gastric aspiration; absence of the intestinal transit for fecal and gas; superior digestive bleeding through acute erosive-bleeding gastro-duodenitis. The missing of the general tonus and the paresis of the even musculature from the intestinal wall are normal results of the laparotomies and of the ample surgical procedures. For the patients respiratory assisted, the impossibility of the mechanical / pharmaceutical correction – when this is allowed – of the intestinal paresis must be taken for a suspicion.
- *Nervous system*: psychomotor agitation, confusion, insomnias, lately bewilderment in time and space and coma. The drowsiness and the state of confusion might be the first signs of an evolving complication. Eisele have marked out of the 80% from the cases with postoperative peritonitis, conciseness'disorders, which have occurred early and isolate, then when no other symptom or real modification of the abdomen could be noticed. The cause of the psychical disorders is related to the bacterial endotoxin with effect to the sugar metabolism from the brain.

-**local** *peritonitic/occlusive* **signs** . The pain is hard being interpreted considering the circumstance of an operated abdomen, so as the classic signs of peritoneal irritation – the defense, the muscular contracture. For this type of patients we are also counting the post-operative medication (pain killers, antibiotics), which may create more misinterpretation. This is why that in case when there is a postoperative peritonitis suspicion, it's recommended the interruption of the pain killers. The exteriorization of digestive liquid (gall liquid, gastric, pancreatic, enteral, feces liquid) over the drain tubes placed away from the performed digestive anastomosis or over the operation wound, together with the possible partial/total evisceration, blocked or opened, indicates in most of the cases that a surgical reintervention is needed. It also matters the quanity and the quality of the liquit collected by the drain tubes which were fixed juxtaanastomotical. A warning sign of a possible secondary peritonitis of a postoperative digestive fistula may be the suppuration or, more serious, the evisceration of the operation wound.

-**bleeding** over the fistula route

-**the absence of the favorable response** to an well-conducted treatment

-**biological modifications**

- Leukocytosis and the left deviation of the leukocyte formula;
- The significant diminution of the platelets number;
- The phosphatemia lessening;
- The increase of the urea and serum creatinine, which indicates the renal function alteration;
- Electrolyte and acidobasis disturbances, which are rather therapeutically compensated than taken as warning signs for the postoperative peritonitis
- The changes of the coagulation dynamic are indicated, together with the another above mentioned abnormalities, the evolution towards multi-organic insufficiency

Frequently, the indication for emergency surgical reintervention at the patients with postoperative digestive fistula is the acute generalized peritonitis. Its treatment is similar to the one of diffuse peritonitis, generally speaking, based on several principles:

1. Repair = the control of the contamination source
2. Purge = the evacuation of the peritoneal content, debridement and washing of the peritoneum cavity
3. Decompress = the prevention or the treatment of the abdominal compartment syndrome

4. Control = the prevention or the treatment of the resistant/recurrent infection through the evolution control of the formal contamination source and the control of the involution of peritoneal inflammation

Criteria of timing the surgical re-intervention

The timing of the surgical re-intervention requires a big responsibility from the surgeon and from the anesthesiologist doctor. The related criteria are:

- Absence of the viscera insufficiency : maintained diuresis, steady hemo-dynamics;
- Absence of the general toxic-infectious signs;
- Absence of the abdominal diffusion signs. Must be taken in consideration the fact that for the elder patients we must not wait for the peritoneal irritation signs, which might be absent in 2/3 cases
- The recovery or the continuation of the intestinal transit
- The absence of the biological alterations: the absence of the leukocytosis, of the azotemia etc.

The decision / the establishment of the surgery moment

If the emergency surgical re-intervention criteria are met, the surgery moment must not exceed 24 hrs from the moment the indication of surgery has been fixed. But if the timing criteria are met, the surgery moment is quite difficult being settled, as the later evolution of the patient is unpredictable. In case of a postoperative intestinal fistula which is being exteriorized along the drain tubes, with reduce flow and showing no sign of diffuse peritonitis and no gravity sign either, the moment of the surgery may be postponed, even cancelled. If the surgeon is finally deciding that the surgery must take place that moment is chosen after 7-10 days, only in the absence of the sepsis. During this period it is established a general treatment for assuring the patient's hydroelectrolithic rebalance, the hematologic and the metabolic one also. Most often, it's preferred the parenteral nutrition. This period of time is a must due to the following reasons:

1. During this time the abdomen skin may heal, allowing the closure after an important surgery
2. The psycho emotional condition of the fistula patient may improve
3. An earlier surgery may lead to the death of the patient, which is usually in a hypercatabolical condition and with nutritional depletion
4. During this time the "spontaneous" closure of the fistula may occur

If the spontaneous closure of the fistula hasn't been achieved and if there is no sign of imminent closure after 4-5 weeks of nutritional support, in case of a free-sepsis patient, is useless to wait any longer, the surgery indication being definitely a must. If the patient shows clear signs of favorable evolution, together with the diminution of the fistula's flow, with the increase of the serum albumin level, the gain of weight and the normal resumption of the intestinal transit, the conservative treatment can be continued without any limit. Nevertheless, sometimes it may be justified to wait for a digestive fistula's closure for around 12 weeks.

The reasons of the conservative treatment's failure are the following:

1. The complete interruption of the digestive continuity
2. The distal obstruction is one of the most common causes of persistence of the digestive fistula
3. The abscess is hindering the healing of the fistula, especially if is not drained adequately

4. The epithelium muco-cutaneous continuity is hindering the healing of the fistula, even in the absence of the infection or the distal obstruction
5. Digestive tract suffering from a disease or wounded
6. The existence of a foreign body can maintain a granuloma, an abscess or it may produce occlusive problems. When the re-intervation is taking place, a minor cause which is maintaining the fistula may be founded, such as a surgical net.
7. Malnutrition is not allowing the healing, neither spontaneous nor surgical.

Permanent therapy

The treatment which implies the digestive continuity restoration and the closure of the fistula may be:

1. Surgical treatment
2. Percutaneous treatment

1. **The surgical treatment** is having two parts:

   1.a. In order that the general condition of the patient to be improved, so as the fistula to close itself spontaneously:
   - The correction of the malnutrition: gastro-stoma, nutrition jejunum-stoma
   - The drainage of the abscesses
   - Solving the digestive occlusion, placed down the fistula
   - Exclusion interventions: proximal derivation (de-functional stoma); latero-lateral anastomosis, with/without Rosanov chicane - Maisonneueve maneuver; unilateral opened exclusion – Senn maneuver; bilateral closed exclusion – Salzer maneuver; bilateral opened exclusion; the external direction of the fistula: with Pezzer tube, Foley tube, Kehr tube, 3 channels spiral silicone catheter .

   1.b Permanent surgeries:
   - "in situ" structure;
   - The suture/the covering of the flaw with a patch (caul, parietal peritoneum, serum intestinal patch, serum-muscular intestinal patch, human duramater patch, Alloderm patch, elastin/fibronectin and collagen rebuilt conjunctive tissue patch, tissue patch containing indigenous and exogenous cells, immunologically non active by using the genetic enginery, elastin patch fixed with cyano-acril, elastin patch and fibrin monomers, muscular flap, cutaneous flap, cutaneous-muscular flap;
   - The extirpation of the wounded intestine and of the fistula, without recovering anastomosis, with the exteriorization of the digestive ends into the stoma;
   - The extraction of the wounded intestine and of the fistula, with restoring anastomosis;
   - With mixed drainage (internal and external)

2. **The percutaneous treatment**
   - Aspiration – instalativ
   - Aspiration
   - Occlusive : parts of the caul conserved at 4*C, parts of fresh or conserved placenta, Gelaspn, collagen, tissue glue, polymers, occlusive bandage

For the conservative treatment of the intestinal fistulas from our study, for procedures have been used: bandage in 7 patients (25%), aspiration drainage in 7 patients (25%), application of Gelaspon in 6 patients (21,43%) and the covering of the fistulous hole with two-sided prothesis (polypropylene and collagen), which has been practiced on 8 patients (28,57%). The healing in the method using the composite prothesis may due to the exogenous oxygen contribution, which activates the mechanisms of gastrointestinal healing. The gastrointestinal healing is involving the neo-synthesis of collagen fibers. In the first stage of

the healing process, the collagen from the submucos layer is damaged. The exogenous collagen located on the anastomosis area may rise the mechanical resistance of the wound and it also may encourage the healing of the intestinal fistula through passive and active mechanisms. It seems that this collagen acts like an active support, amplifying the exogenous process. Due to the degradation of the colagen' syntheses, during the healing process are noticed changes in the spatial and temporal orientation of the collagen. The experimental study conducted by Mutter and contrib. has shown through imuno-fluorescence techniques that the exogenous collagen fibers are incorporated on the area of the digestive anastomosis scar.

The healing

During this phase, the continuation of the nutritional support is crucial. Once it has been achieved the spontaneous/surgical closure of the fistula, is difficult to convince the patient to restart eating.

The traditional alimentary diversification, starting with clear liquids, may be not well tolerated by the patient who did not eat a thing for 4-6 weeks. Is advisable the starting of the alimentation with a light diet. Even after the fistula's healing, the patient is risking late complications:

- Short intestine syndrome makes necessary sometimes the prolonging of the parenteral alimentation at home, until the adjustment of the left intestine;
- The relapse of the intestinal fistula;
- The stenosis of digestive tube on the fistula area;
- The esophageal stenosis secondary to the prolonged keeping of the nasogastric tube is becoming obvious at 3-4 weeks from the discharging. Can be solved by endoscopic dilatation and rarely by extirpation
- The occurrence of pre-visceritis together with the suboclusion or even the occlusion

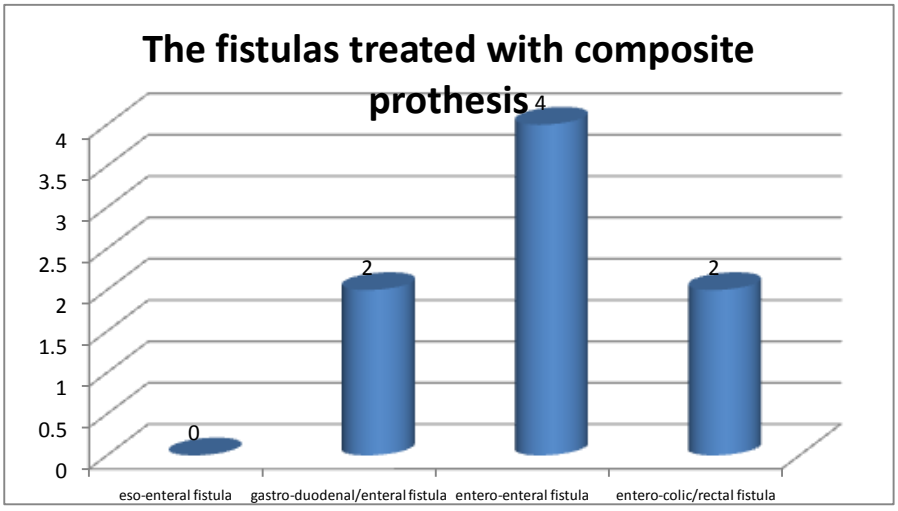
PERSONAL CASE STUDIES

Out of the 98 fistula patients, 28 have been treated conservative, out of which for 8 patients have been practiced an original procedure using the composite prothesis with occlusive mechanism, being fixed by the wall in several points (aponeurosis, muscle or even skin), followed by compressive dressing or sterile compresses with or without drainage.

7.1. Fistula's localization

From the total of 8 fistulas, 2 were presented as being gaso-enterals, 4 entero-enterals and 2 entero-colics.

The distribution of the fistulas related to their localization



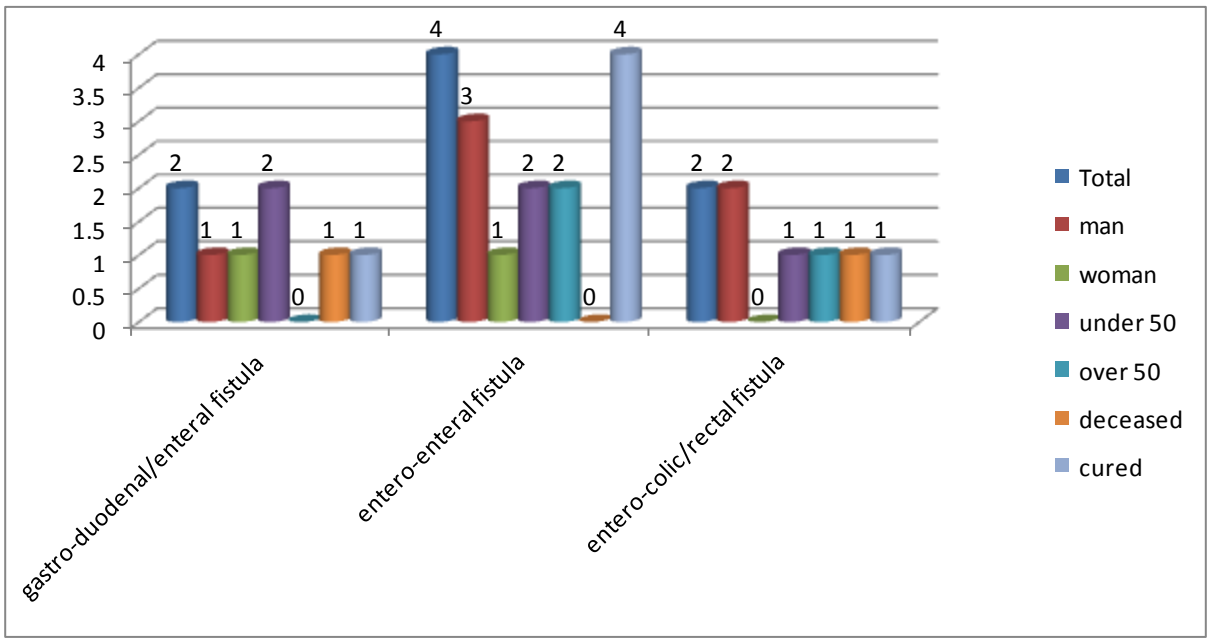
The distribution of the fistulas related to gender, age and evolution

From the group treated with composite prosthesis, there were 6 male patients out of which 1 has presented gastro-enteral fistula, 3 entero-enteral fistulas and 2 entero-colic fistulas.

From the same group, 5 persons were under 50 and 3 over 50. Regarding the same group, there were 2 gastro-enteral fistulas for the patients under 50, 2 entero-enteral fistulas and 1 entero-colic.

Out of the 8 patients treated with prosthesis, 2 have deceased (1 gastro-enteral fistula and 1 entero-colic fistula), 6 cases have evolved favorably being discharged healed or almost healed (1 gastro-enteral fistula, 4 entero-enteral fistulas and 1 entero-colic fistula).

The distribution of the fistulas related to gender, age and evolution



Clinical case.

Patient named A.T of 64 years old, diagnosed with chronic ischemic cardiopathy, high blood pressure, diabetes, comes in the emergency room on 14.05.2008, after a car accident, suffering from diffuse abdominal pain, muscular defense in left iliac fosis. The abdominal computerized tomography shows the existence of a medium quantity of liquid between the intestinal loops. Hemoglobin at the time of hospitalization is 8,2g/l, 13000elem/ml, Proteins 6.3g/l, Urea 49mg/dl, Creatinine 0.74mg/dl, , K 4.8mmol/l. Na 140mmol/l, Weight 75kg. During the surgery it has been noticed a quantity of almost 1000 ml of intraperitoneal blood, originary from the mesentery's desinsertia on almost 15 cm. Segmentary enterectomy has been practiced, by removing almost 20 cm of ileum then termino-terminal entero-enteral anastomosis, hemostasis, lavage, drainage, the patient is receiving a 2 U.I blood transfusion.

The fifth day, the condition pretty good, the blood count shows that the values are normal (L 11500elem/ml, Hb 10.3g/dl), K 5.1mmol/l, Na 139mmol/l, alcaline reserve 23mEq/ICO_2, Creatinine 0,54mg/dl, Urea 66mg/dl, Proteins 6,4g/l, diuresis 2000ml/24hrs, weight 72kg, serous soaked dressing. The peritoneal drainage it has been stopped.

The evolution is a favorable one until the eight day after the surgery when it is noticed the exteriorization of intestinal content through the surgery wound in quantity of 400 ml / 24 hrs, followed after 2 days by blocked evisceration. It is implemented local conservative treatment together with rebalancing treatment for 4 days. It is implemented the parenteral

alimentation for 7 days and it's being administrated Sandostatin. The lab analysis: Hb 9.4g/dl, L 16300elem/ml, Urea 86mg/dl, Creatinine 1.36mg/dl, Alcaline reserve 21mEq/ICO_2, K 4.3mmol/l, Na 135mmol/l, Proteins 5,1g/l, diuresis 1200ml/24hrs, weight 70kg, serous- gall soaked dressing.

Unfavourable evolution with the general condition's alteration and with a growth rate of the fistula's flow until 700-800 ml on day 13. Lab analysis: Urea 210mg/dl, Creatinine 2.92mg/dl, diuresis 700ml/24h, Hb 9.2g/dl, L: 12400elem/ml, K 3.9mmol/l, Na 118mmol/l, Proteins 5,0g/l, Alcaline reserve 19mEq/ICO_2, weight 67kg, and absence of intestinal transit.

Constant evolution for 10 days with the flow's oscillation between 300-1000 with wound's skin damage and unmodified lab values compared with the day 13th.

On the 23rd day, the patient shows improvement of the general condition, L 11500elem/ml, Hb 10.3g/dl, diuresis 1500ml/24h, weight 62kg, alkaline reserve 20mEq/ICO_2, K 4.1mmol/l, Na 124mmol/l, Urea 164mg/dl, Creatinine 1.56mg/dl, Proteins 4,7g/l, serous soaked dressing, fistula's flow until 30ml/24hrs. The resumption of hydro-alimentation and the presence of the intestinal transit for gas and feces. It is decided and it has been fixed a two sided prothesis on the intestinal fistula.

From the first day it has been achieved the decrease of the fistula's flow at almost 200 ml (serous-enteral content), evaluated by the soaked aspect of the dressing. The alimentation per bone it has been stopped, the patient being fed parenterally during the first 3 days, with almost total immobilization and the dressing being changed daily or when needed. Diuresis 1800ml/24 hrs.

On the fourth day, the flow decreased at almost 100-150 ml, leukocytes have maintained around 1000elem/ml, Hg at 10.7g/dl, without the necessity of blood transfusion (it has been used volemic and hydroelectrolythic rebalance by the administration of physiological serum 9% and glucose 10%). Alcaline reserve 22mEq/ICO2. The ionogram showed the correction of the values Na -132mmol/l, K-4.5mmol/l, proteins-5.5g/l. The urea has marked a decrease of its value, until 83mg/dl, creatinine 0.92mg/dl, diuresis 2500ml/24h, weight 63kg. The per bone nutrition is restarted together with the liquid diet. It has been indicated slight movement. To be noted that the evolution of the wound was favorable with the insertion of the composite prothesis.

The tenth day has been marked by the decrease of the fistula's flow at 50 ml. Leukocytes 7500elem/ml, serum proteins 6.6g/l, K 4.7mmol/l, Na 139mmol/l, Hg 12,0g/dl, Alcaline reserve 24mEq/ICO_2, Urea 43mg/dl, Creatinine 0.86mg/dl, diuresis 2200ml/24h, weight 64kg. Semi-solid aliments have been added to the alimentation. On the surgery wound it's noted the emergence of granulation tissue.

Starting with the 15th day after the prothesis' assemblation, the patient starts to move by himself. Lab analysis: Hg 12.6g/dl. Leukocytes 6700elem/ml, Na 140mmol/l, K 4.8mmol/l, Proteins 6.8g/l, Urea 35mg/dl, Creatinine 0.83 mg/dl, alcaline reserve 24mEq/ICO_2, weight 65kg, diuresis 1900ml/24h. Clean dressing. The resumption of the proteic nutrition, the fistula's flow decreased up to 20 ml.

A week later, the fistula's flow is on decrease up to 0ml/24 hrs.

The 22nd day is showing a patient in good general condition, with digestive tolerance, presence of intestinal transit for feces and gas, with normal values of the biological parameters (Hb 13.0g/dl, L: 6100elem/ml, ionogram: K 4.7mmol/l, Na 142mmol/l, Proteins 6,8/l, Urea 45mg/dl, Creatinine 0.71mg/dl), weight 67kg, diureza 1700ml/24h, operatory wound under healing.

On the 25th day the patient is being discharged, with the following recommendations: daily dressing, weekly biological evaluation.

Control pictures on 60 days from the installation of the prosthesis.

Type of the initial operation, the moment of fixing of the composite prothesis, clinical and paraclinical evolution of the patient

Clinical case, A.T. 64 years old Emmergency		Hg g/dl	Leukocytes elem/ml	Transfusion units	General condition	Intestinal transit	Urea mg/dl	Creatinine mg/dl	Diuresis ml	Proteins g/100ml	Weight kg	Na mmol/l	K mmol/l	Fistula flowml	Alcaline reserve mEq/lco2
Preoperative		8,2	13000	2 U.I	Stabilă	+	49	0,74	-	6,3	75	140	4,8	-	-
Surgery		Segmentary enterectomy cca 20 cm ileum with terminal entero-enteral anastomosis													
Postoperative/ Day	5	10,3	11500	-	Good	+/-	66	0,54	2000	6,4	72	139	5,1	-	23
	8	9,4	16300	-	Alterated	+/-	86	1,36	1200	5,1	70	135	4,3	400	21
	13	9,2	12400	-	Alterated	-	210	2,92	700	5,0	67	118	3,9	800	19
Fixing of prothesis	23	10,3	11500	-	Stable	+	164	1,56	1500	4,7	62	124	4,1	1000	20
After prothesis / Day	1	-	-	-	Stable	+	-	-	1800	-	-	-	-	200	-
	4	10,7	10000	-	Stable	+	83	0,92	2500	5,5	63	132	4,5	100	22
	10	12,0	7500	-	Good	+	43	0,86	2200	6,6	64	139	4,7	50	24
	15	12,6	6700	-	Good	+	35	0,83	1900	6,8	65	140	4,8	20	24
	22	13,0	6100		Good	+	45	0,71	1700	6,8	67	142	4,7	0	-
	25	Discharged under healing, with the following recommendations: daily dressing, weekly biological evaluation													

CONCLUSIONS

1. Considering the data mentioned by the literature and the personal experience, I have reached the conclusion that the unpropitious conditions in the healing of the digestive sutures might be classified in two categories: local factors, which are contributing directly at the digestive restoration and systemic factors, which consists in systemic abnormalities, with distance effect, of the sutures.
2. The most frequent systemic propensity factors at the studied patients who developed postoperative digestive fistula were: malignancy, blood transfusions, anemia, malnutrition and sepsis.
3. The surgeons who are intervene on the digestive tract must always have in mind the event of the occurrence of the postoperative digestive fistula and to follow the patient in order to capture the first signs or alarming symptoms.
4. It is always preferred the early diagnosis of the digestive fistula than their neglecting, because the life of the patient may become a “battle against the clock”. By doubting the occurrence of this complication, we will not wait “to see” the patient’s evolution. In this respect, we have always ready to be used the paraclinic investigations.
5. The clinic exam must always be corroborated with the paraclinic investigations, but, ultimately, the first is the one which matters. Furthermore, the paraclinic investigations may unjustifiably delay the moment of the re-laparotomy and this delay may result sometimes even with the death of the patient.

6. In some clinically uncertain cases and unconfirmed by imagistic methods it is preferable a "white" re-laparotomy. The death of the patient may come as a result of the missing of the optimum operatory moment.
7. The necessary investigations for the evaluation of a patient with postoperative digestive fistula must respond to the following questions:
    - What is the main disease, which is its extension rate and what is the condition of the digestive tract next to the fistula?
    - Which is the anatomy of the fistulous route?
    - Which are the metabolic and the nutritional consequences of the fistula and how they should be treated?
    - Which is the gravity of the related infection and how should be treated?
    - Which are the prognostic and the possibility of the spontaneous closure of the fistula?
8. To be mentioned that, together with the investigations needed for the diagnosis confirmation, it is performed – according to those – the rebalancing treatment in case of hydroelectrolithic disturbances.
9. Also, the management of a patient with intestinat fistula is multidisciplinary, involving the surgeon, the anesthesiologist, the radiologist, the gastro-enterologist, the psychotherapist, the stomatherapist.
10. The caring of the patient with intestinal fistula involves important material resources, specialized, experienced and devoted personnel, long period of treatment. That's why it's advisable that, at least the grave patients, to be headed towards specialized centers.
11. Basically, the objectives of the management of a patient suffering from postoperative intestinal fistula are defined by the British acronym "SNAP" – sepsis, nutrition, anatomy, therapeutic procedures.
12. We must identify the sepsis locally or at distance and this must be removed with emergency.
13. Once the sepsis has been removed, the necessary nutrition of the patient must be assured. Considering each case, this may be enteral and/or parenteral.
14. The performed paraclinic investigations will be able to define the anatomic characters of the digestive fistula, related to which the suitable therapy shall be applied.
15. The therapeutic procedures may be conservative or surgical. The surgical indications and the moment of the intervention for the fistula patient are clearly defined. The exception from those indications, the rushing or the delay of the surgical re-intervention might prove to be ill-fated for the patient.
16. The treatment which aims the permanent healing of the digestive fistula may be surgical and percutaneous. It is well-known the fact that this treatment is difficult being standardized and that it mostly depends on the surgeon's decision. And for this specific situation, a well known quip shows to be true: "the doctor it's treating the patient, not the disease".
17. It is preferably that firstly the conservative treatment to be embraced. During this period, on the one hand, the evolution of the fistula may prove that leads to its healing, and on the other hand, the general and local conditions of the patient might improve, which will raise the chances for the further surgical interventions to be successful.
18. The present study describes in national and international première a new occlusive percutaneous method of the external digestive fistula using the composite prothesis, which I have applied in 8 cases, obtaining the fistula's healing in 6 cases. The small number of cases is hindering us to jump to optimistic conclusions regarding this

treatment. The practice and the late experimental studies will stand or not for this method.

19. The surgical treatment has as objectives: the improvement of the general condition of the patient in order to encourage the closure of the fistula, the treatment of the complications generated by the presence of the fistula and/or the solving of the fistula.
20. The type of the surgical intervention which is practiced for the healing of the fistula is adequate related to its localization and to the loco-regional and systemic existing conditions. Three types of such surgeries are described:
    1) the suture of the flaw at the net level;
    2) the extirpation with re-anastomosis;
    3) the digestive exclusion surgery
    The corrective surgeries are not risks free regarding the relapse of the fistula. Worst, these are accompanied by a higher mortality than for the patients treated conservative.
21. The occlusive method with composite prothesis may be a savior solution for a patient, especially in case of desperation and after the failure and the missing of the healing after any other applied treatment.
22. The clinical studies might be eased by the elaboration of computerized data base for the postoperative digestive fistula patients. The elaboration of a computerized and standardized data base allows a centralization of the patients hospitalized in various sanitary units. The large number of the recorded patients may allow observations and conclusions with statistical importance. The access at this data base is easier and it may be requested not only for researching purpose but also for a didactic one.It would also ease up the changes of experience between various units in the country.
23. The results registered in the Surgery Clinic of the Constanta Clinical County Hospital regarding the postoperative general fistulas are similar with those reported by the other national and abroad centers.

BIBLIOGRAPHY

1. Hunter J.G., Becker J.M., Burt R.W., Dixon J.A. Colonie mucosal dissection following electrocautery or laser polypectomy. J Surg Res 1986; 40:534-539.
2. Mircea N., Busu Gr., Constantinescu N., Daschievici S., Burcos Tr., Angelescu N. Terapia în fistulele digestive. Experienţa noastră.. Chirurgia 1987; XXXVL391-401.
3. Neagoe Gh., Neagoe O. Tratamentul actual al fistulelor digestive exerne. Ed. Cargo. Drobeta Turnu Severin: 2001.
4. Beaumont W.S. Experiments and observations on the gastric juice, and the physiology of digestion. 1833. 123-279
5. LewisD., PenickRM. Faecal fistulae. Int Clin 1933; 1:111-130.
6. Deveney C.W., Dunphy J.E. Wound healing in the gastrointestinal tract. In Hunt TK, Dunphy E. Fundamentals of wound management. New York: 1979:569-592