Title:

Current status of the postoperative fistula in the gastrointestinal tract. A multi-centric and multi-national study. "FISTULA DAY"

Key words:

Abdominal sepsis, anastomotic leak, enteroatmospheric fistula, enterocutaneous fistula, hostile abdomen, anastomotic dehiscense, intestinal anastomosis, intestinal perforation, intestinal failure.

Background:

The enteroatmospheric fistulas and enterocutaneous fistulas are usually the result of an intestinal leak which wasn’t properly diagnosed.

Even though the close follow up of the patient is a cornerstone in the early diagnosis of the intestinal leak, there is evidence that a high level of suspicion by the treating physicians impacts on the evolution.

Current treatment actually depends on the moment in which the diagnosis is made, which makes the treatment quite varied and with total absence of a standardized criteria.

As of today, there is no such thing as a generalized and broadly implemented classification for fistulas or intestinal leaks.

Treatment and surgical techniques that are being implemented are based on series of case reports as well as retrospective series with a staggering amount of method flaws.

There is enough evidence to demonstrate that the failure to achieve an early and accurate diagnosis of intestinal leaks and intestinal fistulas is a common denominator in such patients.
**Justification:**

There is no history of previous studies of this nature in worldwide. Studies describing the issue with precision that allow us to take a glance at the current status and prevalence of the gastrointestinal Leak/fistula.

The study intends to contribute new information about how frequent the problem is how varied the diagnosis and treatment approaches are as well as the risk factors and the low standardization level that current managements have.

The study intends to unify and standardize criteria for diagnosis as well as for treatment.

**Bibliography:**

Multiple studies about intestinal leaks and fistulas have been presented throughout the years, looking to identify risk factors, affected population, incidence and morbidity for this disease, however, there are few in which the standardization of treatment get’s mentioned. The few published studies which attempt to approach a standardization of treatment tend to have a poor methodology in their elaboration. For this study protocol, studies which have been published in the last ten years that talk about intestinal leaks and or fistulas, incidence, risk factors, diagnostic methods and treatment will be reviewed, very few from the mentioned above have attempted to establish a standardization of specific treatment.

**Objectives:**

**General:**

Identify the prevalence of the postoperative gastrointestinal leaks/fistulas.

**Specific:**

Analyze the diversity in the diagnosis which is frequently described as fistula. Demonstrate that the failure to properly diagnose a fistula often has an inadequate and deficient management.

Propose a standardized classification of the diagnosis clustered by scenarios.
follow up of the reported patients either with a leak or fistula for a period of 60 days, divided into two cohorts, the first being in 30 days and the second at day 60 from the beginning of the study.

Have knowledge of the current management of the postoperative gastrointestinal leaks/fistulas.

**Hypothesis:**

“The prevalence of the postoperative gastrointestinal fistulas continue to be elevated and the clinical entity difficult to diagnosis and treatments are variable”.

**Methodology:**

Environment of the study.

2nd and 3rd level Hospitals, latinamerica, international environment.

**Population to be studied:**

All in-hospital patients with a diagnosis of gastrointestinal leak/fistula.

**Exclusion and inclusion criteria:**

Any and all hospitalized patients in the public and private sector, adult population on a specific and previously agreed date. North America, Latin America, Europe. Outpatients will be excluded.

Past history of gastrointestinal anastomosis or a repair of gastrointestinal perforation will be included.

**Sample size and sampling procedures:**

Every patient admitted in none primary care hospitals meaning general hospitals and highly specialized hospitals in North America, Latin America, Europe, Asia.
Design of the study:
Cross-sectional, descriptive, analytic

<table>
<thead>
<tr>
<th>Variable</th>
<th>Concept Definition</th>
<th>Operational definition</th>
<th>Type of variable</th>
<th>Measuring scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Amount of time that person has lived, starting from the day of birth.</td>
<td>Patient’s age in years, at the moment of the admission in the hospital.</td>
<td>Discrete quantitative.</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>Organic condition that differentiates male and female.</td>
<td>Male or female, confirmed by an official document.</td>
<td>Nominal Qualitative.</td>
<td>Female Male</td>
</tr>
<tr>
<td>In-hospital stay</td>
<td>Amount of days a patient remains in the hospital.</td>
<td>Amount of time since the hospital admission</td>
<td>Discrete quantitative</td>
<td>Capture the exact LOS</td>
</tr>
<tr>
<td>Comorbidities</td>
<td>Adjacent Clinical situation the patient suffers from coupled to the current diagnosis.</td>
<td>Clinical situation which may or may not compromise the patient’s progress in a direct or indirect manner.</td>
<td>Binary Qualitative.</td>
<td>Calculate the Charlson comorbidity index</td>
</tr>
<tr>
<td>Primary diagnosis</td>
<td>Main reason why the patient is being hospitalized</td>
<td>Clinical situation which drives the patient to be admitted to the hospital to be treated for the first time.</td>
<td>Dependent.</td>
<td>Example given: abdominal hernia.</td>
</tr>
<tr>
<td>Intestinal fistula</td>
<td>Abnormal communication between two epithelial surfaces.</td>
<td>Abnormal communication which derived from two surfaces on the same course. This clinical condition doesn’t cause hemodynamic instability</td>
<td>Binary Qualitative.</td>
<td>yes/ no</td>
</tr>
<tr>
<td>Intestinal leak</td>
<td>Abnormal content discharge from a portion of the gastrointestinal tract.</td>
<td>Clinical condition which causes sepsis, secondary to the abnormal content discharge from the gastrointestinal tract, most common in the first days of treatment.</td>
<td>Binal Qualitative.</td>
<td>Yes/No</td>
</tr>
<tr>
<td>Gastrointestinal anastomosis</td>
<td>Surgical conection between two portions of the gastrointestinal tract.</td>
<td>During the patient’s treatment, he/she needed a surgical conection of the gastrointestinal tract.</td>
<td>Qualitative Binal</td>
<td>Yes/ NO</td>
</tr>
<tr>
<td>Body mass index</td>
<td>Relation between height and weight.</td>
<td>Weight/Size</td>
<td>Quantitative Continuous</td>
<td>Capture the actual</td>
</tr>
<tr>
<td>Fasting</td>
<td>Deprived from food and beverage.</td>
<td>Due to the patient’s current condition, the doctor prescribed deprivation from food and beverage.</td>
<td>Continuous Qualitative Binal Quantitative</td>
<td>YES/ NO Number of days</td>
</tr>
<tr>
<td>Body weight</td>
<td>Amount of mass a body posses.</td>
<td>Amount of mass a body posses, determined by kilograms, these values will be taken from a scale.</td>
<td>Quantitativa y continua</td>
<td>Number expressed in kilograms.</td>
</tr>
<tr>
<td><strong>Albumin and total proteins</strong></td>
<td>Citologic study from the blood components.</td>
<td>Citologic study from the blood components practiced in patients whom will participate in the study.</td>
<td>Dependent</td>
<td>Normal study/ elevation/decrease from the amount of cells that make up blood</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Types of nutrition</strong></td>
<td>Types and forms of the nutritional and caloric contribution</td>
<td>Courses in which calories are contributed</td>
<td>Qualitative normal</td>
<td>- Central Parenteral - Peripheral Parenteral - Oral - Enteral.</td>
</tr>
<tr>
<td><strong>Nutritional needs</strong></td>
<td>Amount of calories necessary to obtain an adequate nutritional balance.</td>
<td>Necessary caloric contribution though different nutritional courses to obtain an adequate nutritional balance.</td>
<td>Qualitative binomial</td>
<td>Caloric and proteins requirements are contributed. Caloric and proteins requirements are not contributed.</td>
</tr>
<tr>
<td><strong>Octreotide</strong></td>
<td>Octapeptide derived from somatostatine with an action mechanism that excels somatostatine</td>
<td>Drug derived from somatostatine that has similar effects but with a more prolonged action spectrum.</td>
<td>Categorical binomial</td>
<td>Applied Not applied.</td>
</tr>
<tr>
<td><strong>Temporary abdominal closure</strong></td>
<td>Clinical situation in which the abdomen is not completely closed.</td>
<td>Surgical management which takes place as a damage control measure, like intraabdominal infections or prevention from other scenarios like elevated intrabdominal pressure</td>
<td>Independent Qualitative Binomial</td>
<td>What type of temporary abdominal closure was used. Was temporal closure implemented? Temporal abdominal closure was not implemented.</td>
</tr>
<tr>
<td><strong>Reoperation</strong></td>
<td>Surgical intervention in an individual who was previously intervened.</td>
<td>Acute Surgical intervention to an individual who had already been previously intervened.</td>
<td>Qualitative Binomial.</td>
<td>Yes No</td>
</tr>
<tr>
<td><strong>Intensive Care Unit</strong></td>
<td>Hospital service in which they care for patients that require a close follow up due to their hemodynamic instability.</td>
<td>Hospital service in which they care for patients that require a close follow up due to their hemodynamic instability or their risk to develop such instability</td>
<td>Qualitative Binomial Quantitative Binomial</td>
<td>Admitted Not admitted Number of days spent</td>
</tr>
<tr>
<td><strong>Fistula discharge</strong></td>
<td>Amount of fluid discharged.</td>
<td>Daily average of the fluid which drains through the fistula.</td>
<td>Quantitative</td>
<td>Number of milliliters.</td>
</tr>
</tbody>
</table>

**Data capture**

Hospitals and facultative participants will be invited to share the required data from patients that fall under the diagnosis of intestinal fistula/leak and are in-hospital at the time of the given date which will be previously selected. The information will be collected on an online platform (Redcap) and will fill in the previously established waiver, this information will be stored in a specific server and than will be downloaded to complete the analysis by the research team.

**Data analysis**
The acquired data will be analyzed using measures of central tendency and standard deviations. The statistical program which will be used in this analysis is REDCAP

**Limitations of the study:**

Technological difficulties from the hospitals that don’t have internet access at the given date.

**Ethical values applied to this study:**

Due to it’s status of descriptive-observational study, patients will never be directly or indirectly intervened in any way, the human dignity of the participants will be intact, therefore ethical conflict doesn’t play a role (sign informed consent). However given that the gathered data will proceed from several medical centers and institutions from different countries, information will be treated with the utmost confidentiality in only one data base by only one member of the research team. Also, personal information such as patient’s names and address will not be required from the hospital reporting the data.

**Workplan: (Attachment 1)**

1.- Two weeks for protocol design.
2.- Two weeks for bibliographic gathering
3.- One week protocol´s design revision
4.- Protocol presentation
5.- Schedule “Fistula day”
6.- Data gathering on the given date.
7.- Two weeks for data analysis
8.- Four weeks to edit the final report
9.- Result presentation on the different forums

**Research team’s experience on the subject:**

FELANPE more than 20 years involved in the education and training of clinical nutrition in Latin America.

Dr. Arturo Vergara (Fundación Sta. Fé, Colombia)
Dr. Manuel Cadena (Fundación Sta. Fé, Colombia)
Dr. Antonio Campos Campos (Brazil)
Dr. Isabel Correia (Brazil)
Dr. Humberto Arenas (México) UFI
Dr. Roberto Anaya (México) UFI
Dr. Juan Fco. García Morales (México) UFI
Dr. Diego Arenas (México) UFI
Dr. Daren Heyland (Canada)
RD. Charlene Compherc (USA)
Dra. Francisca Joly (Francia)

Applicability and practical usefulness of the results:

It will allow us to define the diagnosis, differentiate fistulas from intestinal leaks, classify leaks in scenarios and base on this standardize treatment.

Limit the progress from intestinal failure type II to a type III.

Decrease the expenses and a better use of the resource that is available.

Available resource to acheive the projetc´s completion:

- FELANPE (Latin America)
- Latin American surgery societies and academies
- ASPEN (Usa y Canadá)
  - ESPEN(Europa)
  - PENSA (Asia)
- Surgical associated infectious diseases of Latin America (SISLA)
- FELAC

Appendix:

<table>
<thead>
<tr>
<th>Task</th>
<th>Start date</th>
<th>End date</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity</td>
<td>Start Date</td>
<td>End Date</td>
<td>Duration</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>Protocol design</td>
<td>11/01/17</td>
<td>11/15/17</td>
<td>14</td>
</tr>
<tr>
<td>Bibliographic gathering</td>
<td>11/16/17</td>
<td>11/30/17</td>
<td>14</td>
</tr>
<tr>
<td>Protocol design revision</td>
<td>12/01/17</td>
<td>12/08/17</td>
<td>7</td>
</tr>
<tr>
<td>Protocol presentation</td>
<td>12/09/17</td>
<td>12/16/17</td>
<td>7</td>
</tr>
<tr>
<td>‘Fistula day’</td>
<td>04/20/18</td>
<td>04/21/18</td>
<td>1</td>
</tr>
<tr>
<td>Data collection</td>
<td>04/20/18</td>
<td>06/21/18</td>
<td>60</td>
</tr>
<tr>
<td>Statistic analysis from the data</td>
<td>12/23/18</td>
<td>01/06/19</td>
<td>14</td>
</tr>
<tr>
<td>Final report</td>
<td>01/07/19</td>
<td>01/21/19</td>
<td>14</td>
</tr>
<tr>
<td>Presentation of the report on different forums</td>
<td>09/22/18</td>
<td>09/22/19</td>
<td>364</td>
</tr>
</tbody>
</table>

**Glossary:**

**2nd level:** patients in this type of institution have a higher level of complexity than a primary care clinic, this includes pediatrics, obstetrics and gynecology, general surgery and internal medicine, as well as complementary diagnostic services and treatment.

**3rd level:**
This hospital is a social organization, with the purpose of promoting clinical research and formal education. It has a highly specialized staff, as well as the technical resource to develop activities of protection, recovery and rehabilitation with the culture of prevention. Emergency services, patient care 24 hours a day, 364 days a year. With a minimum capacity of 20 hospitalized patients.

**Enterocutaneous fistula:** established communication between the intestinal epithelium and the skin. It favors the exit of the intraluminal material towards the outer surface and was usually preceded by a digestive leak or an intestinal inflammatory process that favored the loss of the continuity of the visceral wall.

**Enteroatmospheric Fistula:** Loss of the continuity of the visceral wall which is open towards the atmosphere without adhering to the skin. They are usually formed in the context of a hostile abdomen; The intestinal mucosa is evolved in an islet of granulation tissue with the open abdomen. It is usually very difficult to control.

**Leak:** leakage of digestive tract material, given by a loss of the continuity of the digestive wall secondary to lesions, anastomotic dehiscence and / or raphia intestinalis, which causes localized intra-abdominal infection (abscess).
References:

3. Damrauer, S. M., Bordeianou, L., & Berger, D. (n.d.). Contained Anastomotic Leaks After Colorectal Surgery Are We Too Slow to Act?


