ORIGINAL RESEARCH PAPER

General Medicine

UPDATE PREVALENCE AND RISK FACTORS ASSOCIATED WITH SIGMA VOLVULUS

KEY WORDS: Sigma, Acute Abdomen, Risk Factors, Abdominal Pain, Volvulos, Clamp.

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ABSTRACT

This study aims to determine the prevalence of the disease and identification of the most relevant risk factors, to propose a risk profile and appropriate clinical management. The research is descriptive, analytical, retrospective, was performed at a hospital in Quito, Ecuador. medical records were reviewed with diagnosis of volvulus Sigma, 50 records were reviewed, of which the age range most presentation is between 32 to 60 years with 54.3% also was evident the existence of cases in younger ages although it does not correspond with the literature; males had higher prevalence with 60% of the total cases. In the institution which developed research evidenced complication rate with 78.8% of the total, considering that the most important are the presence of postoperative flanges with 15.3%. Demonstrating the importance of risk factors in the study group to take a closer clinical attitude. independent analysis of the variables, and the use of a wider population recommended.

INTRODUCTION

Sigma volvulus is a complication of megacolon, in which there is a twist of an intestinal loop around the mesentery, with partial or total jamming intestinal transit which lead to harmful complications to life. The incidence varies according to geographical area, so that in Africa and South America is between 30-50%, occurring in Peru and Bolivia as the most common cause of intestinal obstruction. (Granados, R., 2014) A volvulus is a twist of the intestine around the axis of its blood supply. In the case of a sigmoid volvulus, the twist occurs in the sigmoid mesentery at its base. Sigmoid volvulus is the most common type of volvulus of the colon. Less common are caecal volvulus and volvulus of the transverse colon. It presents most commonly in patients who are less mobile, bed bound and institutionalized, usually with a background of chronic constipation

Copious intake of foods rich in cellulose and fermentable could be the precipitating factor for volvulus. The inhabitants of areas living in areas above 3,000 meters high have the colon length and diameter greater than the inhabitants of the plain. The high fiber diet inhibit the histological phenomenon called elastogenesis, which is the formation of elastic fibers as microfibrils or fibrillar component and amorphous component after inducing the gradual growth of the colon. (Saravia, J., 2014)

The abundant supply of products having cellulose is considered reagent volvulus, and high fiber

The clinical picture of the Sigma volvulus can occur in different ways, which sudden abdominal pain associated with constipation, bloating, vomiting and difficulty removing flatus. Diagnosis is clinical and radiological manner. With a thorough physical examination and abdominal radiographs diagnosis is obtained. Thus the plain abdominal radiography we can come immediately to the diagnosis because you can see the characteristic sign "coffee bean" from Sigma volvulus.

The treatment is still in dispute because we have to take into account the state of the patient, location of the lesion and especially the experience of the surgical team.

Etiology

In order for a volvulus to occur, the bowel needs to be able to twist around a narrow-based mesentery. This occurs mostly in less mobile patients with a history of chronic constipation, where the sigmoid colon becomes chronically distended and redundant.

Definition

Volvulus Sigma box is a mechanical obstruction caused by twisting of a segment of the colon full of air around the mesenteric axis, and producing luminal obstruction of blood perfusion alteration progressing strangulation, gangrene and

perforation. 90% of cases occur in the sigmoid colon mainly mesenteric anatomy and factors associated with it. (Garcia, G., 2011) (Townsend, C., 2017)

The colon is divided into right and left by an imaginary line which passes over the transverse colon, volvulus located on the right side are produced by congenital malformations 15-30%; while the left side correspond to the sigma given by an abnormally movable handle associated diseases expand and lengthen a sigma 45- 80%.

Epidemiology

Volvulus Sigma is considered a disease of poor presentation in developed countries, the United States occurs in 4% of blockages of the colon, however, in South America, Africa, Middle East, India and Russia, considered as a region of the belt of the volvulus, the frequency of occurrence is greater, with about 50% of cases.

Sigmoid volvulus is more common in Africa, as the food intake is of high fiber and the base of the sigmoid mesentery in the African population is narrow compared with other ethnic groups, leading to an anatomical situation that makes the population more susceptible to developing a sigmoid volvulus.

The degree of twist in acute cases of Sigma volvulus may reach 180-540 °, being in 10-35% of cases. A twist of 360 ° occurs in 50% of cases. Torsion is contrary to the hands of the clock and the most common location of volvular sigma twist this around the mesenteric axis located at 15-25cm from the anus, being more accessible to the site by a sigmoidoscopy. (Saravia, J., 2014)

Pathophysiology

Volvulus is a classical example of a large bowel closed loop obstruction. If inflow and outflow of the colon are both obstructed, the obstructed bowel will continue to distend, due to a large amount of gas forming bacteria trapped inside. This will eventually lead to a perforation of the obstructed segment.

While the colon is obstructed and distending, there is impaired blood supply, leading to ischemia, as well as bacterial translocation of the gut flora. Usually, the venous outflow is compromised first, increasing congestion even further, until arterial supply stops. The colonic mucosa is most susceptible to ischaemic insult, leading to an impaired barrier and translocation of bacteria, until the ischemia affects muscular and serosa, leading to necrosis and perforation.

Sigmoid volvulus can become a recurrent situation, and in those patients treated conservatively, the base of mesentery will eventually become fibrotic and the bowel chronically distended.

History and Physical

Patients presenting with volvulus are usually of an older age group with potential other comorbidities, often have reduced mobility or are bed bound and commonly get referred from residential and nursing homes. A history of chronic constipation is common. The symptoms usually leading to acute hospital admission are a loss of appetite and reduced oral intake, increasing abdominal distension, and cessation of bowel output. Patients complain of discomfort due to the significant distension, but are rarely in pain, unless ischemia and/or a perforation have occurred. They can, however, have respiratory compromise due to the splinting of the diaphragm that is a result of the colonic distension.

Patients may present with sigmoid volvulus as a recurrent problem if they have been treated with conservative measures in the past. A recurrent episode of volvulus needs to be taken a seriously as a first presentation and requires the same attention to history and physical examination as a patient presenting with volvulus for the first time.

Examination of the abdomen reveals significant distension, a generalized tympanitic percussion note and potentially guarding and rebound over areas of ischemia or impending perforation. If a perforation has already occurred, the patient will be grossly peritonitic. Digital rectal examination reveals an empty and often capacious rectum.

Evaluation

The patient should have the standard blood work (full blood count and renal function tests), to aid in resuscitation and assess the kidney function for a potential CT scan with contrast. Plain abdominal radiographs will show the classical coffee bean or kidney bean sign, and often dilatation of the proximal colon. Depending on the duration of symptoms, the proximal colon can decompress into the distal small bowel, as long as the ileocaecal valve is incompetent. CT scan shows the characteristic "whirl" appearance of the twisted mesentery, as well as the distended loop of sigmoid colon with an air-fluid level. Free air on either the abdominal radiograph or the CT scan indicates a more serious bowel perforation and requires immediate action.

A CT scan is recommended to establish the diagnosis and distinguish the etiology from other causes of large bowel obstruction, such as a malignant tumor. This is especially the case if the patients present with symptoms for the first time and have not had any previous colonic investigations such as a colonoscopy.

Clinical forms

Acute presentation: sudden onset, is a clinical low intestinal obstruction with colicky pain and abdominal distension, absence of flatus and stools, which are added nausea and vomiting. Evidence exploration and diminished rectal hydroaerial noise level reveals an empty ampoule. This is the presentation may divide the same time into two subtypes, depending on the degree of vascular compromise: with early vascular compromise, with late vascular compromise, described in the following table. (Londo, D., 2010) (Townsend, C., 2017)

	Early vascular commitment	Late vascular commitment
Frequency	25%	75%
Start	Fast	slow
Evolution	Rapid	Progressive
Clinic	Intense pain, early vomiting, signs of shock	Low abdominal pain
Physical examination	Diffuse abdominal distention, no defense palpation and muscular contracture, empty rectal blister	Bayer sign, Von Wahl sign, Koval sign, empty rectal blister

Chronic presentation features larvado boxes start to behave as partial bowel obstruction less intensity of abdominal pain. The paintings although usually resolve spontaneously, recurrent, and reflect incomplete volvulaciones (minor torsions 180) that fails to engage the mesenteric blood flow in the affected area, however they can lead to acute obstruction completely volvulus some of recurrences. (Londo, D., 2010)

Recurrent presentation: cases which then recur in endoscopic or surgical treatment are included. (Londo, D., 2010)

Clinical manifestations

The clinical picture is the acute intestinal obstruction, typically formed by the triad of abdominal pain, bloating and constipation, also may be associated with other symptoms

such as, nausea, lack of flatus, abdominal discomfort and inability to flatus low channel. Vomiting occurs late and if it is marked abdominal distention may occur respiratory and cardiac compromise. (Granados, R., 2014) (Garcia, G., 2011) (Townsend, C., 2017).

Physical examination reveals a diffuse bloating, can present a palpable mass. Abdominal distention level especially left iliac fossa may be a data suggestive physical examination. The presence of shock and temperature rise can be demonstrated against colonic perforation. Rectal examination shows an empty rectal ampulla. (Granados, R., 2014) (Garcia, G., 2011) (Townsend, C., 2017).

The duration of symptoms can be between 10 hours and 5 days determining the surgical procedure will require.

Classification

The Sigma volvulus has four degrees according to the rotation of the colon, presentation of symptoms and circulatory compromise.

Class		Treatment	Mortality
C1		Detorsion, or sigmoidomesopexy, or sigmoidomesoplasty (Resection with primary anastomosis)	0-1%
C2	C2a C2b	Detorsion, or sigmoidomesopexy, or sigmoidomesoplasty Detorsion (Sigmoidomesopexy, or sigmoidomesoplasty)	1-5%
C3	C3a C3b	Detorsion Detorsion	5-20%
C4	C4a C4b	Resection with primary anastomosis* Resection with primary anastomosis* (Resection with stoma)	10-30%
C5		Resection with stoma (Resection with primary anastomosis*)	15-80%

* In the presence of bowel ischemia, edema, perforation, and difference in bowel diameter: resection with stoma
( ) Second choice

Laboratory exams

Is mainly a CBC which could manifest leukocytosis, that is with or without deviation to the left of the formula, which when present suggests states throttle or peritonitis in the patient Shows signs of hemoconcentration as well as hemoglobin, hematocrit and elevated plasma proteins. Electrolytes can be decreased, urea can be elevated by extrarenal origin, and usually glucose levels due to the stress of the patient. (Londo, D., 2010)

Radiological examination

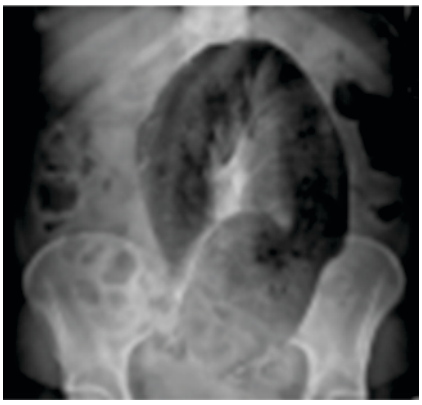
You should apply a simple abdominal radiography and barium enema.

Studies show great gaseous distension of the volvulada handle, being able to fill the entire abdominal cavity itself. With a simple abdominal can be diagnosed 60-70% of cases. Standing position highlights the intestinal air-fluid levels with a liquid / gas ratio increased to two and sometimes a marked elevation of the left hemidiaphragm and absence of gas in rectal blister is observed. (Londo, D., 2010)

Other signs that can be described are:
There are two segments of parallel handle, have the same distance and thus the same characteristics.

Sigmoid volvulus. Comparatively to a cecal volvulus, a sigmoid volvulus will show findings of a bent inner tube sign with the apex of the volvulus located in the left upper quadrant. Contributed by Wyckoff Heights Medical Center 2016

Sign of the coffee bean: It is observed the sigma rotated, filled with air and a line or central strip thickened, which is formed by the union of both walls turned colon. Disappear haustral of the sigma and intestinal contour is smooth and curvilinear.



Treatment

Conservative management: is to relieve the blockage and prevent recurrent episodes. Should start managing the patient with relief from the clinical picture by placing a nasogastric tube, to reduce abdominal distension, applying urinary catheter to drain the urine or control hourly diuresis, also must be corrected electrolyte imbalance by administering hydration solutions, that maintain stable vital functions and use of antibiotic therapy to control the infectious process to be instituting .. initial treatment and the method of choice in patients with viable bowel is sigmoidoscopy. Decompression rigid sigmoidoscope is successful in 70- 90% of cases. When there bloody fluid, mucosa while observing blackish or has plates should be deleted necrosis procedure. (Botella, C., 2005) (Garcia, G., 2011) (Lopez, J. 2017)

Surgical Management: Indicated laparotomy in case of failure or decompression performed after persistent leukocytosis fever or clinical suggesting intestinal ischemia, perforation or peritonitis. (Botella, C., 2005) (Garcia, G., 2011) (Lopez, J. 2017)

In the presence of colonic necrosis resection of the compromised segment and colostomy Hartman type is performed. Mortality in emergency surgery necrotic colon is around 38%, compared to the range in which elective surgery is around 8%. (Castejón, M., 2015) (Lopez, J. 2017)

Resection anastomosis and primary bowel preparation is not controversial, studies such as Bagarani and colleagues reported a mortality of 0% with primary anastomosis viable bowel and 33% mortality in primary anastomosis with necrotic bowel. Taha instead reported a mortality of 60% in primary anastomosis in intestinal gangrene. The embodiment of a method of Hartman has a mortality of 9% and 13% mortality. (Guelfand, M. 2011).

The sigmoidopexia and fixing the sigmoid to the side wall of the abdomen is another treatment option is valid when there is adequate circulation and volvulus has been previously decompressed. (Castejón, M., 2015) (Lopez, J. 2017)

complications

Untreated complications are the high rate of mortality and complications related to surgical treatment are: wound dehiscence, bleeding haemoperitoneum for working port, surgical site infection, wound seroma. Other complications associated with this disease are related to the recurrence of

the sigmoid volvulus. The discharge occurs between the 4th and the 9th postoperative day, increasing the risk of complications.(Garcia, G., 2011)

MATERIALS AND METHODS

Study Population

It will be analyzed patients admitted with a diagnosis of volvulus Sigma in the service of General Surgery Quito. This research was conducted in QuitoHospital of the Ministry of Public Health, which has the Department of General Surgery. The period analyzed is since 01 January 2020 until 30 June 2022.

Inclusion criteria

- Patients were included with age greater than or equal to 20 years.
- They include patients diagnosed radiologically Sigma volvulus.

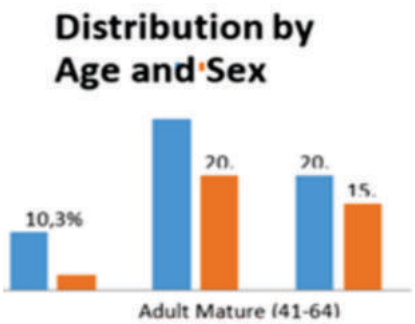
Exclusion criteria

- Excluding patients under 20 years.
- Excluding patients whose medical records are not in the area of statistics.
- Excluding patients who are outside the period established research.
- Excluded patients without radiodiagnostic

Population size

A total of 100 cases were reviewed by obstructive acute abdomen, yielding 57 diagnostic clinical histories Sigma volvulus, in the period from 2020 to 2022, of which 21 were excluded stories for being misplaced or incomplete information therein, presenting a total of 40 patients, no calculation of the sample was required to be a small universe.

RESULTS



The number of cases presenting diagnostic Sigma volvulus by medical records in the study, correspond to 43.8% (n = 40), **This prevalence of the diagnosis in this study at this institution.**

This study is conducted for about 3 years, being so the greater number of cases presented in 2017 with 51.3% of the total studied (n = 17), followed by 2016, with 30.8% (n = 12), and finally 2018 with 17.9% (n = 7). Given that over the past year only cases are taken for 6 months.

Distribution of patients by age and sex

Based on the WHO classification the distribution of patients by age group and sex is done, showing thus:Young Adult (20-40 years) a percentage of 10.3% in men (n = 4) and 2.6% in women (n = 1) of the total patients studied; mature adult (41-64 years) with a percentage of 30.8% in men (n = 12) and 20.5% in women (n = 8), which is the age group with the highest number of cases and elderly (over 65 years) 20.5% (n = 8) in men and 15.4% women (n = 6), consistent with the literature in relation to gender distribution, being more common in men but the number of cases in relation to the age group is discordant with literature.

Distribution of patients by reason of consultation

The main problems that led patients to go for health care are: abdominal pain with a percentage of 100% (n = 39), abdominal distention with 30.8% (n = 12) and those who had abdominal distention is 69.2% (n = 27) Is evidence that surgical treatment is greatest amount with a percentage of 51.3% (n = 20) and non-surgical treatment corresponding to use of nasogastric tubes, bladder and rectal addition to the clinical management (hydration, analgesia, antibiotic) , occurs in 48.7% (n = 19) as the only handling the remaining patients.

Of the total patients in whom surgical treatment was performed, 70% (n = 14), he provided volvulus Sigma grade IV as surgical finding, while 30% (n = 6), presented volvulus Sigma Grade II. Could not show the remaining degrees as operative findings.

DISCUSSION

43.8% of the patients studied correspond to diagnosis of volvulus Sigma given parameters clinical, radiologic, and surgical research institution, based on medical records considered valid for the study according to the criteria for inclusion and exclusion thereof, showing the prevalence of this disease remains high in our environment, compared to other countries, such as the first world that have a lower prevalence with about 4% (Townsend, C., 2017); agreeing with the display value in countries of the Andean region.

The factors most important risk to consider as predisposing to present volvulus Sigma are: age, sex, ethnicity, place of residence, schooling and food, so it was evident a percentage of presentation of 51.3% in mature adults (41-64 years), which do not correspond with the evidence presented by other authors state that the most common age of onset is between the sixth and eighth decade of life, showing that in this study corresponds to 36% this range age, although it is revealed that this condition is present at any age, draws attention to the presence of cases in young adults (20-40 years) with a percentage of 12.8% documented in this research.

11.1% of the Ecuadorian population has as work activity agriculture (INEC 2010), considering that it has a significant bearing on the occurrence of volvulus Sigma evidenced in this study that 46.2% of the patients presented as work activity the agriculture, associated with both schooling, ethnicity and power, influencing factors in the presentation of this pathology. Schooling no theoretical basis of association volvulus Sigma, however, in this study the absence of schooling is associated with this change and is 41% while the primary school is associated by 51.3%.

Feeding in the population in the Andean region it is mainly based on the consumption of vegetables, carbohydrates and fiber, with low proportion of proteins, given primarily for the ease of the inhabitant in the preparation thereof (Ochoa, F., 2008) (Ron, A., 2009), associated with labor activity as mentioned above with agriculture; in this study detailed information feeding patients achieved 54% of which food to consume the main are in descending order of carbohydrates, followed by vegetable fibers and proteins.

The main sign associated with this condition corresponds to abdominal pain, occurring in all cases of this study, besides being associated with the presentation of abdominal distention as another sign and important symptom, with a percentage of 30.8% of the total cases. Could also show that in the most important clinical signs and symptoms will be the tenderness, bloating, air-fluid noises diminished or absent, absence of flatus and constipation in various proportions, but equally important.

The presence of complications associated with more days of hospital stay, is presented in May and number of

complications between third and sixth day of hospitalization with 29 . 2 %; the most frequent complication was postoperative flange with 10.3%, and the mortality rate associated with this disease is 7.7% of the total cases presented within the first day of hospitalization.

CONCLUSIONS

It was found that the prevalence of the volvulus Sigma in the time period studied is 43.8% in patients treated at the Hospital of Latacunga with diagnosis of obstructive acute abdomen, also was identified the main risk factors associated with the volvulus Sigma as sex in accordance with the literature; also one of the factors most important risk factor is age, because even though the mentioned literature increased frequency of cases between the sixth and eighth decade of life, he determined in this larger study prevalence between the fourth and sixth decade life, followed by the elderly (over 65 years).

Recommendations

Conduct investigations of variables these in larger towns and several villages, since the results may be influenced by our demographics and limitations of the study design, to reinforce the validity of the presence or absence of risk factors detailed above and its association with Sigma volvulus.

Investigate the correlation between the f iling of complications and length of hospital stay in association with this disease, because patients of this study despite having a short hospital stay presented early complications.

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