



**EVALUATION OF THERAPEUTIC ROLE OF GASTROGRAFIN IN
ADHESIVE SMALL BOWEL OBSTRUCTION POST CONSERVATIVE
TREATMENT DEEMED UNSUCCESSFUL**

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Received 12th July 2021; Revised 14th Aug. 2021; Accepted 27th Oct. 2021; Available online 15th Feb. 2022

<https://doi.org/10.31032/IJBPAS/2022/11.2.1002>

ABSTRACT

Objective

Evaluation of therapeutic role of Gastrografin in the management of small bowel obstruction post conventional line of treatment which is conservative management is deemed unsuccessful in the treatment of the same

Framework

The contrast medium used for the above study is gastrografin which is a water soluble and hyperosmolar in nature. Gastrografin has been helpful in predicting the requirement of surgery. In this study we will also assess its usefulness as a therapeutic agent in small bowel obstruction

Methods

Patients presenting with signs and symptoms pertaining to that of adhesive small bowel obstruction were given a trial conservative management excluding those cases in which strangulation of bowel was suspected. The subjects who elicited a response to conservative line of management within forty-eight hours of time period were continued with conservative

line of management. Subjects exhibiting no betterment within the initial forty-eight hours either by signs /symptoms or radiological studies had been randomized to ahead with Gastrografin meal along with follow-through observation or surgical treatment. The subjects were further evaluated in accordance to visualisation of gastrografin in large bowel within a time period of 24 hours. If gastrografin was present in the large bowel after 24 hours, the subject was considered to be suffering from “partial” small bowel obstruction and therefore the conservative line of management was continued. On the other hand, subjects in whom abdominal x-ray did not show appearance of contrast in large bowel were treated with exploratory laparotomy eventually

Results

Keeping all the signs and symptoms of small bowel obstruction, 124 patients with a total of 139 episodes of small bowel obstruction were taken in consideration for the study. 3 patients required immediate surgical treatment on admission due to high suspicion of strangulated bowel out of which strangulation was confirmed in two patients due to intra-op findings. One hundred episodes of obstruction elicited significant improvement within the given time period of initial forty-eight hours and as a result of this conservative treatment was continued for those patients. Out of these patients, only one subject underwent surgery after receiving conservative remedy for six days which was considered unsuccessful. 35 patients did not show any signs of improvement in the initial forty-eight hours. The usage of gastrografin in 14 patients revealed partial obstruction. Obstruction got relieved in all of the subjects sooner or later after a median of 41 hours. The five patients left underwent exploratory laparotomy as the gastrografin study pointed towards complete obstruction. Hence the usage of Gastrografin as a result caused reduction in the need of performing surgery surgical procedure by 74 percent. No complication occurred in the course of this study which could be attributed to use of gastrografin. No subject underwent strangulation of bowel in both groups

Conclusions

Hence using Gastrografin in cases with provisional diagnosis of adhesive small bowel obstruction is in comparison safer and reduces the requirement of surgery in cases where conservative treatment fails to show desired results.

Keywords: Gastrografin, Bowel Obstruction, Post Conservative Treatment

INTRODUCTION

Adhesive small bowel obstruction till days to hospital admission.to reach the diagnosis constitutes a main group of patients leading of small bowel obstruction is in general and

hence requires very careful assessment and evaluation. In those patients whom strangulation of bowel is suspected, exploratory laparotomy should be performed according to the recommended literature. To give a trial of conservative therapy is accepted wherein the obstruction is incomplete. However, no definite time period for which conservative management should be carried out has not been defined yet.

Using the above demonstration, we have obtained a result that gastrografen has a diagnostical value as it helps in predicting the need for surgical intervention and while its usage as therapeutic medium continues to be researched, certain aspects regarding its efficacy is still in question. Gastrografen is one of the most widely studied contrast medium. The aim of the following prospective randomized trial is to observe the therapeutic value of this particular contrast medium, in patients presenting with signs and symptoms of small bowel obstruction who sadly don't show any response to conservative line of management.

METHODS

Patients

The following study includes patients who are above the age of 16 presenting to the emergency department with signs and symptoms of small bowel obstruction along

with exhibiting signs of small bowel obstruction in radiological studies. Patients with established diagnosis of malignancy of abdomen, IBD or presence of history of radiation therapy were excluded. The initial assessment was done by taking proper history, time of onset of symptoms, any predisposing factors along with careful evaluation of the patient.

Initial approach is to introduce a nasogastric tube which helps in providing decompression of the distended bowel, all the while keeping a strict watch on its output. Next step is to give IV fluid support and correcting any existing deficit of electrolytes as per individual patient's requirement. Along with the above-mentioned steps it is also deemed important to keep a keen watch on the abdominal girth of the patient.

Management Plan

Exploratory laparotomy was the end result in those subjects in whom strangulation was suspected to begin with. while for the patients being treated conservatively, a close watch on their vitals, abdominal girth and serial abdominal x-rays were mandatory to assess if there was any progress. Patients diagnosed with small bowel obstruction who showed signs of improvement were said to be showing progress by using the following signs

1. Physical signs:

- decrease in tenderness over abdomen
- decrease in abdominal distension
- decreasing trend of NG tube output
- bowel movements (passing of flatus/stool) in cases where patients presented with constipation on admission

2. Radiological signs: improvement is co related with decrease in dilated bowel loop and in general decrease in diameter of dilated small bowel

Patients who showed improvement using the above signs in the initial 48 hours were continued on conservative management

The group of patients who elicited no improvement neither medical nor radiologic within forty-eight hours were concluded to have failed conservative treatment and as a result they were randomly chosen to undergo exploratory laparotomy or Gastrografin meal along with a follow through study with the help of radiographs. An informed consent is taken and with the help of a radiologist gastrografin meal is performed. Steps of performing the gastrografin study are:

1. Careful introduction of gastrografin via NG tube with a check on the

patients complains of nausea and keeping medicines to relive the symptoms ready

2. Two hourly follow up x-rays done in a serial manner to assess the course of contrast medium

The assessment was done in the following 24 hours by checking if the contrast medium appeared in large bowel before completion of 24 hours. If in case the obstructive site provides slight passage to air and fluid present in the bowel, those patients were diagnosed with partial obstruction and conservative line of management was continued. However, if no contrast medium was visualised in 24 hours, a diagnosis of complete obstruction is made and hence the next step would be performed exploratory laparotomy for those patients.

Conclusion of absolute resolution of bowel obstruction was only reached when all signs and symptoms both physical and radiological subsided. Following the establishment of resolution of obstruction liquid diet can be started for those group of patients which if tolerated well was followed up with introduction of soft diet followed by regular diet. Discharge would only be given if regular solid meals are well tolerated by the patients

Statistical Analysis

Univariate evaluation was established by usage of the Student T check or the Mann-Whitney for continuous variables and with the help of chi-square or Fisher preclaimed those tests for categorical variables. $P < .05$ was taken into consideration as to being significant keeping statistics in mind.

A sample size of 154 patients was formed which gives strength of 80% all the while assuming a failure rate of 30% in conservative treatment and reduction in operative management by 26 %. Results showed that by usage of gastrografen significantly brought down the rate of surgical intervention by 74% after evaluation of 139 episodes of obstruction hence giving the strength of 95% due to which ,study could be concluded.

RESULTS

The time period for this particular study was set from July 2020 to October 2021. A group of 125 patients with a total of 140 episodes of adhesive small bowel obstruction were taken in the study. The mean age was observed to be 66 years (ranging from 17–95). While Ninety patients gave past history of undergoing abdominal surgeries out of which cholecystectomy, appaendicectomy ,colorectal surgeries and gastroduodenal surgeries out of which gastroduodenal surgeries turned out to be the commonest.

DISCUSSION

Adhesive small bowel obstruction can result as a complication of any abdominal operation most commonly being post appendectomy and post colorectal surgery [2]. Our results exhibited that cholecystectomy and gastroduodenal surgical treatment additionally generally triggered adhesive bowel obstruction.

The topic management of adhesive obstruction has always been under controversy as the ideal time for observation for conservative treatment has not been defined in any literature. When to reach the conclusion of conservative treatment being unsuccessful and patient needs surgical intervention is not yet clear. The following studies can be taken into consideration:

1. Study conducted by Cox *et al* suggested that of patients who were cured through conservative remedy, most had obstruction resolved within forty-eight hours.
2. Recommendation made by Assalia *et al* was that surgical procedure should be taken into consideration if the obstruction did not improve after 48 hours of conservative remedy [8].
3. Findings made by studies performed by Sosa and Gardner was that patients without symptoms of

strangulation might be dealt with nonoperatively for twenty-four to 48 hours.

Our aim of performing the evaluation of therapeutic value of gastrografin in conservative management deemed unsuccessful. The ideal way to carry out the study would require an inclination towards conservative management by surgeons rather than immediate surgery but this approach in turn also increases the risk of strangulation of bowel in patients. Before we arrived at the results of this study, the common approach to small bowel obstruction would be to perform surgery if no improvement was proven by physical signs and radiological signs. The above mentioned is an acceptable basis for proceeding to surgery is according to available literature [8].

The risks related to failure of conservative management is still not properly understood. Our observation was that nasogastric tube output would be appreciably greater in patients who did not respond to conservative treatment in comparison to the ones efficaciously treated with conservative management. This can be explained by variable in severity of obstruction in different patients. The extent of bowel distention was observed to be similar between the two groups, despite the fact that one might

suppose that patients with grossly distended bowel might be much more likely to need surgical treatment. Among the one hundred and one instances handled conservatively for greater than 48 hours, most effective one affected person with prolonged obstruction in the end required surgical intervention. Patients who showed improvement to conservative treatment within the first forty eight hours had a ninety nine % (one hundred/101) chances of improvement with nonoperative remedy. In accordance to Seror *et al* patients with continual obstruction above 5 days in most cases required surgical intervention.

Other Water-soluble contrast medium are being evaluated recently in order to achieve the ability to foresee the need for surgery in adhesive small bowel obstruction. Further Studies are being executed to assess their possible therapeutic value. Most commonly used contrast medium still remains to be Gastrografin which is an, mixture of

1. sodium diatrizoate,
2. meglumine diatrizoate,
3. and a wetting agent (polysorbate 80).

Making it an ionic mixture with osmolarity of 1900 mOsm/Which is about 6 times compared to that of extracellular fluid (ECF). This difference in osmolarity results into shifting of fluid into the bowel lumen which in turn increases the pressure

gradient across the site of obstruction. The content present in the bowel loops as a result gets diluted, and along with the dampening agent, passage of bowel contents via a narrowed lumen is comparatively easier while also decreasing oedema of the bowel wall and increasing bowel motility [6, 8]. Another contrast medium taken in use to assess the adhesive small bowel obstruction is barium but as it isn't easily diluted via enteric fluid as Gastrografin it provides a better mucosal photograph on radiography. But a barium study is risky given it could become inspissated and trigger complete obstruction. If in case any perforation is present in the bowel in a patient presenting with signs and symptoms of small bowel obstruction Barium can also disperse into the peritoneal cavity. Gastrografin being water-soluble and is deemed safer even in presence of perforation. Complications of using Gastrografin in small bowel obstruction are less seen but a few that could be considered life threatening are

1. anaphylactoid reactions
2. deadly aspiration

Gastrografin brings down the chances of postoperative ileus and relieve intestinal obstruction as a result of impacted *Ascaris lumbricoides* and bezoar [8].

Chen *et al* performed studies to elicit that of water-soluble contrast medium has a

prognostic value in the control of adhesive obstruction⁶. Results accumulated by the above study showed that patients in whom contrast was discovered inside the colon within 24 hours were all dealt with efficiently without surgical operation. Exploratory laparotomy was performed for patients in whom contrast didn't reach the colon in 24 hours. Randomized controlled study performed via Assalia *et al* showed evidence that Gastrografin drastically relieved obstruction, shortened the hospital stay, and decreased the requirement for surgical treatment inside the treatment group. However, other studies performed said no advantage of water-soluble evaluation in adhesive small bowel obstruction was noted. Similar consequences had been obtained in Fevaang *et al's* study. No difficulty was assigned to the usage of the gastrografin in these researches. Gastrografin was administrated quickly after admission in these trials. The technique in our study was distinctive: Gastrografin was given to patients who didn't respond to conservative treatment. To our knowledge, there has been no similar technique in different studies

We finish that Gastrografin is secure and reduces the want for surgical operation whilst conservative treatment fails.

Acknowledgement-

I am thankful to Mrs. Rupali Salunkhe for secretariat help, Krishna Institute of Medical Sciences, Deemed to University, Karad, Maharashtra (India).

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