Original Article

Effectiveness of Gastrografin in Resolving Small Bowel Obstruction

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ABSTRACT

Objectives: To determine the effectiveness of Gastrografin in resolving intestinal obstruction.
Study Design: Observational / descriptive study.
Place and Duration of Study: This study was conducted in the Department of Surgery, Shaikh Zayed Hospital, Lahore from 02-10-2013 to 02-04-2014.
Materials and Methods: One hundred thirty five patients who having small bowel obstruction were admitted through out-patient, accident & emergency departments. Every participant was explained about both procedures and their consequences.
Results: Average age was 44±70 years. 77 (57%) were males and 58 (43%) were females with a male to female ratio was 1.32:1. In 58 (43%) male patients the obstruction was resolved, but in 19 (14%) male patients obstruction was not resolved. In 41 (30%) female patients the obstruction was resolved and in 17 (12%) female patients the obstruction could not be resolved. Overall, in 99 (73%) patients, the obstruction was resolved but in 36 (27%) of patients the obstruction was not resolved.
Conclusion: Gastrografin is a secure and reduces the need for surgery when conservative treatment fails. It remains a leading cause of hospital admission in surgical departments.

Key Words: Gastrografin, Small bowel obstruction, Intestinal obstruction.

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INTRODUCTION

In surgery small bowel obstruction is a common complication. The intra-abdominal adhesions are the leading cause of small bowel obstruction. It has been observed that surgery can lead to new adhesions; the non-operative management is the preferred way in the absence of peritonitis or strangulation.[1] The surgical intervention may be required in 20-30% of the patients not responding to conservative treatment or who develop complications if the surgery is delayed for more than 48 hours. It has been found that Gastrografin is very helpful for predicting the outcome of obstruction.[2]

Initially, the Gastrografin was used for diagnostic purpose and radiographs used to be taken to see whether it reached the caecum or not. It has been shown to resolve adhesive small bowel obstruction and significantly decreases the length of stay in the hospital.[6]

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Gastrografin is a Hydrophilic substance when given for non - operative treatment of an uncomplicated small bowel obstruction, the advantage is taken of the high osmotic pressure of the contrast medium, the surrounding tissue is forced to release considerable amounts of fluid, which then flows into the gut and resolves the small bowel obstruction.

Abdelkader et al, it has been demonstrated that 66.6% of the patients subjected to Gastrografin administration, the adhesive small bowel obstruction resolved within 3-12 hours (average 7.5 hours).[7] In the Gastrografin group obstructions resolved subsequently in 31 of 38 cases (81.5%) after a mean time of 6.4 hours. The use of Gastrografin in adhesive intestinal obstruction is safe and reduces the operative rate and the time to resolution of obstruction.[8] There are controversies regarding the resolution of bolus obstruction by using Gastrografin.[7,8,9]

MATERIALS AND METHODS

This descriptive case series study was conducted in the Department of General Surgery at Shaikh Zayed Hospital, Lahore from 02-10-2013 to 02-04-2014. One hundred thirty five patients were selected as per the inclusion criteria. Study variables were age, sex, time of onset of symptoms, chief complaints, history of the illness, symptoms and signs, clinical examination, baseline investigations and radiological findings. After labeling the obstruction, the patient was resuscitated. The baseline X-ray abdomen was taken to establish the intestinal obstruction. Then 100ml of Gastrografin was

given through nasogastric tube followed by clamping of the tube. Then immediate x-ray abdomen in erect posture was taken, then after 2 hours, 4 hours and after 6 hours to establish diagnosis. If the contrast was not reaching in large intestine within 6 hours, it was considered as a complete obstruction and was an indication for exploration. After 8 hours the radiograph were also taken. The proposal was approved by the hospital ethical committee. An informed consent was obtained from the patient confidentiality observed. All the data was collected on proforma and was entered in SPSS version 16. The quantitative variables age was presented by using Mean±SD. Frequency and percentages were calculated for gender and complete resolution of intestinal obstruction.

RESULTS

The average age of patients was 44±70 years. Majority of the patients (47%) were above the age of 40 years (Table 1). There were 99 (73%) patients who had resolved the obstruction and 36 (27%) patients did not resolve the obstruction. In 44 (33%) patients obstruction was resolved but in 20 (15%) patients the obstruction was not resolved with Gastrografin and 44 (33%) patients who had resolved the obstruction and 12 (9%) patients had not resolved the obstruction were between 20-40 years of age while 12 (9%) patients had not resolved the obstruction and only 4 (3%) patients did not resolve the obstruction (Table 2). In 36 patients we observed that obstruction was not resolved with Gastrografin and underwent surgical intervention. Amongst these patients 30 patients were having previous history of abdominopelvic region (Table 3) and 6 patients were having no previous history of previous surgery.

Table No.1: Age distribution of patients (n=135)

Age in years	No. of Patients	Percentage
20– 40	56	41.0
41– 60	63	47.0
>60	16	12.0
Total	**135**	**100.0**
Mean ± SD	44.70±14.45	

Table No.2: Obstruction resolved according to patients age (n=135)

Age in years	Yes	No
20– 40	44 (33%)	12 (9%)
41– 60	43 (32%)	20 (15%)
>60	12 (8%)	4 (3%)
Total	**99 (73%)**	**36 (27%)**

In 30 patients, the operative finds were consistent with adhesion obstruction and adhesiolysis was performed. But in 6 patients having no previous history of operation, were having other pathologies. Amongst this group, 1 (3.0%) patient was having ileo-ileal intussusception and resection anastomosis was done. Two (6.0%) patients were gangrene of ascending colon, 1 (3.0%) patient with mass caecum, one (3.0%) with mass right colon and they all underwent right hemicolectomy. In 1 (3.0%) patient, preoperatively found stricture of ileum and stricturoplasty was done (Table 4). In our study most of the patients 77 (57%) were male and 58 (43%) were females with male to female ratio 1.32:1.

Table No. 3: Obstruction not resolved with Gastrografin and explored surgically (n=36)
Previous history of surgery (n=30)

History of Surgery	No	%	Findings	Treatment
Transabdominal hysterectomy	3	8.0	Adhesions obstruction	Adhesiolysis
Open cholecystectomy	6	17.0	Adhesions obstruction	Adhesiolysis
Diagnosis laparoscopy	1	3.0	Adhesions obstruction	Adhesiolysis
Appendectomy	7	19.0	Adhesions obstruction	Adhesiolysis
Exploratory laparotomy for perforated appendix	3	8.0	Adhesions obstruction	Adhesiolysis
CBD exploration	2	6.0	Adhesions obstruction	Adhesiolysis
Exploratory laparotomy for intestinal obstruction	5	13.0	Adhesions obstruction	Adhesiolysis
Exploratory laparotomy for ruptured ectopic pregnancy	1	3.0	Adhesions obstruction	Adhesiolysis
Caesarean section	1	3.0	Adhesions obstruction	Adhesiolysis
Exploratory laparotomy for blunt renal trauma	1	3.0	Adhesions obstruction	Adhesiolysis

Table No.4: Obstruction not resolved with Gastrografin and explored surgically with no previous history of surgery (n=6)

Findings	No.	%	Treatment
Intussusception (ileo-ileal)	1	3.0	Resection and anastomosis
Gangrene right colon	2	6.0	Right hemicolectomy
Carcinoma caecum	1	3.0	Right hemicolectomy
Mass right colon	1	3.0	Right hemicolectomy
Stricture of ileum	1	3.0	Stricturoplasty

When we considered gender, in 58 (43%) male patients the obstruction was resolved, but in 19 (14%) male patients, the obstruction was not resolved. In 41 (30%)

female patients the obstruction was resolved and in 17 (12%) female patients the obstruction could be resolved with Gastrografin. Overall, in 99 (73%) patients, the obstruction was resolved but in 36 (27%) of patients the obstruction was not resolved (Table 5).

Table No.5: Obstruction resolved according to gender distribution

Gender	Yes	No
Male	58 (43%)	19 (14%)
Female	41 (30%)	17 (12%)
Total	**99 (73%)**	**36 (27%)**

DISCUSSION

Most people with small bowel obstruction primarily managed conservatively because in many cases, the bowel opens up. The conservative treatment involves insertion of a nasogastric tube, correction of dehydration and electrolyte abnormalities. Opioid pain relievers may be used for patients with severe pain. Antiemetics may be administered if the patient is vomiting. If obstruction is complete a surgery is required.

In our study the mean±SD age was 44.70±14.45 years. The mean age varies, according to the inclusion criteria of various studies. A study done by Wadani the mean age was 38.2 years and age range from 19-69 years.[2] A study reported by Safamanesh the mean age of patients was 44 years (ranging from 14 to 80 years) which is comparable with our study.[10] Al-Salamah reported the mean age was 35.70±12.65 years.[5]

In our study there were 44 (33%) patients who resolved the obstruction after passing the Gastrografin and in only 12 (9%) patients, the obstruction could not be resolved between 20-40 years of age. There were 43 (32%) patients who resolved the obstruction between 41-60 years of age and 20 (15%) patients could not resolves the obstruction while 15 (8%) patients had resolved the obstruction and only 4 (3%) patients had not resolved the obstruction >60 years of age. The whole resolution of bowel obstruction showed the mean administration of Gastrografin of 41 hours.

There were 77 (57%) male patients while 58 (43%) patients were female with male to female ratio of 1.32:1. Chu[11] reported that 44 (62%) were males and 27 (38%) were females and ratio was 1.62:1. Wadani[5] also reported male to female ratio was 1.83:1, which is comparable with our study.

The conservative management can be used safely for postoperative bowel obstruction up to 5 days.[12] Hostetter[13] also reported that small bowel obstruction can be treated surgically if obstruction was not resolved within 12 hours of non-operative treatment. In another study reported by Brolin et al[14] that failure of conservative treatment requires prompt laparotomy usually within 24 hours.

Sosa and Gardner[15] reported that patients who have adhesive small bowel obstruction can be treated conservatively for 24-48 hours, if no signs of strangulation were recorded. However, Bizer et al[16] noticed that 48-72 hours is a ample time for conservative treatment. Chen[17] also reported that resolution of adhesive small bowel obstruction might be weighed against the need to decrease the complication of delayed surgery.[17] This study indicated that operation should be performed in patients in whom Gastrografin fails to reach the colon within 24 hours.

The reports of recent studies have indicated that abdominal computed tomography and ultrasonography may improve the diagnostic accuracy of bowel strangulation increasing the safety of conservative treatment. The use of Gastrografin in the management of adhesive bowel obstruction has been evaluated in recent years.[18]

CONCLUSION

Gastrografin is a safe and reduces the need for surgery when non-operative management fails. Also oral Gastrografin helps in the management of patients with small bowel obstruction and allows a shorter hospital stay. It also showed that administration of Gastrografin in the patients who have small bowel obstruction symptoms decreased the need to surgery. Because of its therapeutic effect, it seems logical to try Gastrografin administration before the decision for surgical intervention which may impose unwanted complications and excessive cost.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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Corrigendum

Materials and Methods in **Abstract** of article titled '**Short Term Outcome of Single Stage Anterior Sagittal Anorectoplasty in the Management of Rectovestibular Fistula in Female Children**' (**Muhammad Ramzan, Asif Qureshi, Farasat Majid and Sofia Mustafa**) printed at **page 60** in the Med Forum Vol. 27 No.6 **(June, 2016)** as 'for this study twenty seven rabbits of either sex were selected and divided in three groups, control group, low dose group and high dose group, each group having nine rabbits. The dose of the drug was calculated according to weight of the animals,' may be read as follows:-

Materials and Methods: Total 151 female children from 1 month to 13 years with the diagnosis of recto vestibular fistula undergoing primary ASARP were selected. No covering colostomy was done in any case. All the patients who were previously operated for RVF, or colostomy done for RVF, and those with septicemia were excluded. All the cases were managed in the ward and short term outcome was assessed in terms of post-operative wound infection (noted at 72 hours after surgery), vaginal tear(assessed during surgery), hospital stay and operative time.

Editor