East African Medical Journal Vol. 83 No. 6 June 2006
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ABSTRACT

Background: **Adhesions after abdominal and pelvic surgery are a major cause of intestinal obstruction in the western world and the pathology is steadily gaining prominence in our practice.**
Objective: **To determine the magnitude of adhesive intestinal obstruction; to determine the types of previous operations in patients who presented with adhesive intestinal obstruction; to determine the outcome of treatment; and to determine the factors affecting the overall management of adhesion-related intestinal obstruction.**
Design: **Retrospective descriptive study.**
Setting: **The Moi Teaching and Referral Hospital (MTRH) – Eldoret, Kenya.**
Results: **Ninety three patients were managed for adhesive intestinal obstruction. Of these, 57 were male and 36 were female. Abdominal distension, bilious vomiting, absolute constipation and abdominal pain were the main symptoms. Forty two (45%) patients were operated on, twenty five (59%) of them being operated on more than 72 hours after the start of the symptoms. Eight (9%) patients had ischaemic gut injury by the time of operation. Fluid therapy was inadequately administered in 86 (92%) patients, and their charts were not completely filled.**
Conclusion: **Adhesion-related intestinal obstruction is a common problem encountered in the surgical service at the Moi Teaching and Referral Hospital – Eldoret. It is the major cause of intestinal obstruction. Fluid therapy and delayed surgical intervention were the major challenges in the management of these patients.**

INTRODUCTION

Adhesions after abdominal and pelvic surgery are common complications and are the major cause of small bowel obstruction in the western world (1–6). The frequency is in the range of 70% - 90% and are responsible for 20% - 25% of infertility in patients who have had prior laparotomies (7). Although their basic aetiology is unclear (5), peritoneal irritation is the basic factor associated with the occurrence. Adhesions occur either as obstructive single bands or matted adhesions (4). They cause obstruction over a variable period of time ranging from the immediate post-operative period to many years after the surgery.

Risk factors that facilitate adhesions include; rough handling of tissues, excessive use of dry packs and gauze, presence of foreign materials (glove powder, excessively long ligatures etc), mass ligation of omentum or mesentery which tends to produce nodules of necrotic fat, residual blood in the peritoneal cavity, raw peritoneal surfaces and ischaemic tissues. To date the only preventive measures is to minimise these risk factors. A number of substances have been used to try and reduce the occurence of adhesions but none has been proven to work. They include: steroids, dextran, anticoagulants, streptokinase, hyaluronidase, chondroitin, polyvinylpyropyrene (PVP) (6). It is speculated that increase in the use of laparoscopic surgery may reduce the incidence of adhesions (1).

The specific aims of this study were: To determine the magnitude of adhesive intestinal

obstruction; to determine the types of previous operations in patients who presented with adhesive intestinal obstruction; to determine the outcome of treatment and duration of hospital stay; and to determine the adverse factors affecting the overall management of adhesive intestinal obstruction.

MATERIALS AND METHODS

This retrospective descriptive study was carried out in Moi Teaching and Referal Hospital (MTRH), which is the teaching hospital for Moi University School of Medicine. MTRH has a bed capacity of 500. Of these, 100 beds are surgical. It is a referral hospital for 15 other smaller hospitals (district hospitals, sub-district hospitals and mission hospitals). It covers a catchment population of about 13 million. The furthest district hospital is well over 500 Km away.

The study population included cases of intestinal obstruction due to adhesions admitted in Moi Teaching and Referral Hospital between the years January 2000 -December 2004. The diagnosis of "adhesion" was made on clinical basis (evidence of previous abdominal surgery) and confirmed at laparotomy in those operated on. Secondary data were sourced from the theatre registers and from the patients' files in the Records Department. Files with inadequate data were excluded.

RESULTS

A total of 93 files of patients presenting with intestinal obstruction due to adhesions were analysed. Of these, 57 were male and 36 female giving a male: female ratio of 1.6:1. The median age range was 30-39 years (Table 1).

Abdominal pain was present in 85%, bilious vomiting was present in 75%, absolute constipation in 73%, and abdominal distention in 50%. Thirty six (39%) patients presented within two days of the start of the symptoms, 29% within three to four days, and 32% in five days or more. A combined total of male and female patients who had had previous laparotomy was 77%. This group included those operated on for appendicitis. Twenty three (23%) patients had had gynaecological/obstetric operations previously (Table 2).

Forty two (45%) patients were operated on, 7% of these within 24 hours, 29% in 48 hours, 5% in 72 hours and 59% in more than 72 hours of the start of the symptoms. Twenty two (52%) patients were operated on within 24 hours of admission. Only four (10%) of those who required operation stayed beyond 72 hours on expectant management following admission.

Thirty six per cent of patients operated on had adhesive bands, 45% had matted adhesions, and 21% had adhesions and small gut volvulus, 19% had

Table 1

Age and sex distribution of patients with adhesive intestinal obstruction

Age (Years)	Sex					
	Male	(%)	Female	(%)	Total	(%)
0–9	3	3.2	0	0	3	3.2
10–19	10	10.8	5	5.4	15	16.2
20–29	7	7.5	4	4.3	11	11.8
30–39	12	12.9	18	19.4	30	32.3
40–49	3	3.2	5	5.4	8	8.6
50–59	6	6.5	4	4.3	10	10.8
60–69	11	11.8	0	0	11	11.8
70–79	3	3.2	0	0	3	3.2
80+	2	2.2	0	0	2	2.2
Total	57	61.3	36	38.8	93	100

ischaemic gut requiring resection beyond the point of adhesive compression. Adhesiolysis was done in 62%, while 38% required resection and primary anastomosis. Eighty six (92%) patients received inadequate fluid therapy and fluid charts were incompletely charted.

Table 2

Findings at admission of patients with adhesive intestinal obstruction

Finding	No.	(%)
Abnormal vital signs	9	9.7
Dehydration	53	57.0
Abdominal distension	63	67.7
Abdominal tenderness	56	60.2
Visible peristaltic waves	10	10.6
Bowel sounds present	63	67.7
Bowel sounds absent	30	32.3

Table 3

Post operative complications

Complication	No.	(%)
Enterocutaneous fistula	1	2.3
Hypovolaenic shock	2	4.8
Peritonitis	2	4.8
Wound sepsis	6	14.3
Death	3	7.1
Total	14	33.3

Table 3 shows the complications encountered during the management of the 93 patients. Majority (54%) were discharged within seven days, 27% within 8 - 14 days and 16% stayed beyond 14 days.

DISCUSSION

During the study period, 263 patients were admitted and treated for intestinal obstruction. A diagnosis of obstruction due to adhesions was made in 107 though only 93 files were analysable. This was the major cause of intestinal obstruction. Adhesions have overtaken other causes like hernia noted in most underprivileged parts of the world. This is an indicator that adhesive intestinal obstruction is an emerging surgical problem set to parallel what has been observed in the western world (1–6) as surgical services become more accessible. The referrals to this hospital are selected patients whom other hospitals are less competent in handling and adhesion is likely to be one such problem hence the outcome. Contrary to reports from the western world (7), laparotomy was the most common previous surgery in the patients seen (appendicitis and gynaecological surgery are the most common in the western world) (6).

The goal of treatment should be to relieve the obstruction before complications of ischaemic bowel injury set in (1,8). In our series, eight cases had ischaemic bowel. Non-surgical management of complete obstruction is only in order if clear evidence shows gradual improvement in symptoms, abdominal signs and radiographic evidence of resolution. This conservative management should not be extended beyond 72 hours (6). In this study, majority of the patients managed surgically (57%) were operated on, more than 72 hours since the beginning of the symptoms. Significant delay does occur during self-presentation to hospital or through the complex and inefficient referral system that exists. This delay has to be taken into account when considering institution of expectant management in patients who may not have obvious signs of a catastrophe in the abdomen at the time of admission. Imaging studies that include contrast and computerised tomography have been shown to expedite the process of diagnosis of complete obstruction (10-12), predicting the need for early surgery, even in the absence of signs of ischaemia.

Fluid therapy and nasogastric (NG) tube management presented specific problems that require to be addressed. Fluid charts were poorly kept and inadequate fluids were administered in 92% of the patients. Fluid therapy was based on a 24-hour period. It should be realised that fluid therapy is a dynamic process that involves taking care of maintenance requirements, correction of current imbalances and attention to on-going losses (13-15). It is divided into three parts: Patient evaluation; development of an initial fluid plan; and feedback and adjustment of the initial plan as a result of monitoring. Pre-determined volume is given in a specific period of time and the changes in physiological variables are monitored then followed by appropriate responses by the caregiver and so on until the imbalances have been corrected. Frequent monitoring assures adequacy of volume administration, as calculated initial amounts are only approximations. Fluid therapy based on a 24-hour

period in a patient presenting with a deficit is therefore not rational and should be discouraged. Well-kept charts not only ensures that the therapeutic regimen is being followed as prescribed, but also permit rapid and easy calculation of approximate balances.

On going abnormal fluid losses in these patients during the management are mainly represented by output through the NG tube. This is an important tool whose full potential was not exploited. Once placed, it must be actively managed. Active monitoring and a regime of frequent suction using a syringe and measuring the output has to be put in place. The measured output is replaced using ringers lactate over and above the calculated maintenance requirements.

CONCLUSION

Adhesive intestinal obstruction is the most common cause of intestinal obstruction in surgical patients presenting at the Moi Teaching and Referral Hospital, and is poised to occupy the surgeons' time. There is need to minimise extending conservative management of adhesive obstruction beyond 72 hours and the period of symptoms prior to admission should be taken into consideration. All doctors operating on patients (abdominal/pelvic) should try to minimise the known risks of adhesions. Washing off glove powder before operation is such a benign and inexpensive procedure yet benefits are prophylactically significant. There is greater need to improve on fluid therapy and monitoring of patients with intestinal obstruction.

ACKNOWLEDGEMENTS

To the Institutional Research and Ethics Committee, and the Moi Teaching and Referral Hospital Administration for allowing this study, and Miss. M. Ooko for secretarial services.

REFERENCES

1. Howard C.F. Other causes of intestinal obstruction. In: Paediatric surgery, Vol. 2. Fifth edition, by O'Neil J.A. Jr. *et al. St. Louis.* 1998: 1215-1218.
2. AL-Tooks S., Platt R. and Tulandi T. Adhesion related small bowel obstruction after gynecologic operations. *Amer. J. Obstet. Gynecol.* 1999; **180:** 313-315.
3. Miller G., Bowman J., Shier I. and Gordon P.H. Aetiology of small bowel obstruction. *Amer. J. Surg.* 2000; **180:** 33-36.
4. Miller G., Bowman J., Shier I. and Gordon P.H. Natural history of patients with adhesive small bowel obstruction. *Brit. J. Surg.* 2000; **87:** 1240-1247.
5. Ellis H., Movan B.J., Thompson J.N., *et al.* Adhesion related hospital readmissions after abdominal and pelvic surgery. A retrospective cohort study. *Lancet.* 1999; **353:** 1476-1480.
6. Intestinal obstruction. In: Bailey and Lowe's short practices of surgery. 24th Edition. Edited by Russel R.C.G., *et al.* International students' edition. Approved London. 2004; 1186-1202.
7. Banks E.S. and Shaver P.R. Laparoscopic surgery. In: Textbook of surgery, the biological basis of modern surgical practice. 15th Edition. Edited by Sabistone D.C. Jr. W.B. Sanders Company, Philadelphia. 1997; 800-801.
8. Gastrointestinal aspiration. In: Hamilton Bailey's emergency surgery. 9th Edition. Edited by Mc Nair T.J. Bristol John Wright and Sons. 1972; 382.
9. Bindos S., Pares D., Mora L., *et al.* Randomised clinical study of gastrografin administration in patients with adhesive small bowel obstruction. *Brit. J. Surg.* 2003; **90:** 542-546.
10. Choittk C. and Law W.L. Therapeutic value of gastrografin in adhesive small bowel obstruction after unsuccessful conservative treatment. A prospective randomised trial. *Annals Surg.* 2002: **26:** 1-6.
11. Guthriee H. C., Cadogan M., Murchinson J.T. and Paterson-Brown S. Water-soluble contrast study predicts the need for early surgery in adhesive small bowel obstruction. *Brit. J. Surg.* 1999; **86:** 714-715.
12. Donckier V., Closset J., Van Gansbeke D., *et al.* Contribution of computed tomography to decision making in the management of adhesive small bowel obstruction. *Brit. J. Surg.* 1998; **85:** 1071-1074
13. The acute abdomen: Intestinal obstruction. In: Primary surgery, Vol. 1. Edited by Maurice King *et al. Oxford Med. Publ., Oxford.* 1990; 142-169.
14. Fluids and electrolyte management. In: Essentials of pediatric surgery. Edited by Marc Rowe *et al.* Mosby, St. Louis, USA. 1995; 38-46.
15. Yeo C.J. Fluids and electrolyte therapy. In: Current surgical therapy. 4th Edition. Mosby St. Louis USA. 1992.