

BARIUM ENEMA REDUCTION OF INTUSSUS CEPTION IN CHILDREN

GOON HONG KOOI

SUMMARY

Barium enema hydrostatic reduction was carried out for eight patients with intussusception over a six-month period. There were five successes (62%) and three failures. There were no mortality or complications arising out of this procedure. The technique is discussed. This procedure offers many advantages over surgical reduction. However, it is not a substitute for surgery which is still indicated in the sick infants and in those where hydrostatic reduction failed.

INTRODUCTION

Intussusception is one of the commonest paediatric surgical emergencies in infants and children.^{1,2} Surgical reduction has always been the mainstay of treatment in our Paediatric Surgical Unit, Universiti Kebangsaan Malaysia (National University of Malaysia).³ Recently, however, with the availability of the services of radiologists on call, we commenced using barium enema hydrostatic reduction as the first line of management in selected cases.

The aim of this report is to show the usefulness

and effectiveness of this technique and the many advantages it has over surgical reduction.

MATERIALS AND METHOD

Patients admitted with a provisional diagnosis of intussusception were carefully screened. A definite clinical diagnosis could usually be made in most instances and in patients in good condition. If there are no contraindications, barium enema reduction is then attempted. In some cases where the diagnosis is uncertain, a preliminary diagnostic barium enema is done first to confirm the diagnosis. This is then followed by a therapeutic reduction.

The procedure is contraindicated in patients who are very sick (Table I). Toxic symptoms, dehydration and shock indicate that the problem is far advanced and thus render this procedure unsafe. Clinical evidence of peritonitis will obviously contraindicate the procedure. A full blown intestinal obstruction seen on abdominal X-rays indicate far advanced disease and the gut is very liable to perforate if the procedure is attempted.

Goon Hong Kooi, MBBS (Mal.), FRCS (Edin.)
FRACS (Paed, Surg.)
Department of Surgery
Universiti Kebangsaan Malaysia
50300 Kuala Lumpur, Malaysia

Technique

This procedure should be carried out only in a large hospital by radiologists and surgical doctors (Table II). All cases are immediately resuscitated with intravenous fluids on admission. They are all dehydrated even though clinically they do not

TABLE I
CONTRAINDICATIONS TO BARIUM ENEMA
REDUCTION OF INTUSSUSCEPTION

Very sick patients
Clinical evidence of peritonitis
Intestinal obstruction on abdominal X-rays
Perforated bowel

TABLE II
PROTOCOL FOR BARIUM ENEMA REDUCTION
OF INTUSSUSCEPTION IN CHILDREN

Selection of patients
Preliminary preparations:
 Intravenous resuscitation
 Nasogastric decompression
 Blood for Hb, BUSE, group and cross-match
 Abdominal X-rays
 Anaesthetist and operating theatre staff informed
Actual Procedure — in X-ray department
Post-Procedure:
 Successful — recovery in ward
 Unsuccessful — straight to surgery

appear so. There is usually a big loss in the 'third space' in the abdomen. A nasogastric tube is inserted and the patient kept nil orally. Preliminary investigations include urgent blood for haemoglobin, blood urea and electrolytes, group and cross matching and abdominal X-rays. The operating theatre staff and anaesthetist are prewarned, so that there would be no delay in carrying out surgery if barium enema reduction failed or complications arose.

A surgical doctor accompanies the patient to the X-ray Department. The equipment required for this procedure is relatively simple. A large size (22 or 24 F) Foley's catheter connected to a bag of barium placed at one metre above the patient is used. After insertion per rectum, the balloon of the catheter is blown up and the

buttocks are strapped securely to prevent leakage of barium and hence constant hydrostatic pressure can be achieved.

The procedure is carried out under fluoroscopic screening. The diagnosis is confirmed when the head of the intussusception is outlined by barium. The progress of the reduction is monitored by fluoroscopy. The procedure is continued as long as there is noticeable progress, shown by movement of barium pushing the head of the intussusception proximally along the colon. Complete reduction is indicated by reflux of barium into the small intestine, totally opacifying the 'gut window' formed by the large intestines.

The procedure can be repeated up to three times if initially unsuccessful, allowing the barium to flow back into the bag and resting the gut for a few minutes in between attempts.

The whole procedure should not exceed an hour and should be given up if there is no progress after this time. The bag of barium should not be raised higher than one metre as this will increase the likelihood of perforating the bowel.

If the procedure is successful, the patient is sent back to the ward and kept under observation overnight. Oral fluids are commenced the following morning and the patient is discharged after two days in hospital.

If the procedure is unsuccessful, the patient is sent straight to surgery for operative reduction.

RESULTS

From January to June 1985, eight patients with intussusception were treated by barium enema reduction. The race, sex and age incidence are summarised in Table III. The triad of abdominal pain, vomiting and rectal bleeding were the main presenting symptoms (Table IV).

A definite clinical diagnosis was established in seven out of the eight patients. There was some difficulty with the five-year-old child. The diagnosis was confirmed with a diagnostic barium

TABLE III
RACE, SEX AND AGE INCIDENCE*

		Number
Race	Malays	7
	Chinese	1
Sex	Males	8
	Females	0
Age	1 year	5
	1 - 2 years	2
	5 years	1

* n = 8

TABLE IV
CLINICAL PRESENTATION*

Clinical features	Number
Abdominal colic	7
Vomiting	7
Blood in stools	4
Mass in abdomen	6
Blood in rectum	6
Duration of symptoms < 72 hours	8
Definite clinical diagnosis	7

* n = 8

enema which was followed by a therapeutic barium enema.

There were five successes and three failures (a success rate of 62%) (Table V). All five successes were discharged well after two days in hospital. They were all well on early follow-up. There were no complications arising from the procedure. Surgery was uneventful in all the three failures. Manual reduction was achieved easily and none required resection of gut. The post-operative recovery was uneventful and all three were discharged after seven days in hospital.

TABLE V
RESULTS OF THE REDUCTION

Outcome of Reduction	Number	(%)
Success	5	62
Failure	3	38
Total	8	100

DISCUSSION

In this small series of eight cases, it is difficult to comment very much on the success rate. Even though the 62% success is comparable with other centres,^{1,2,4} a larger series is needed to make the results more meaningful. However, the main aim of this paper is to highlight this technique and to expound its many advantages over surgical reduction.

There was no mortality in this series. In recent times, there has been no mortality reported in many other big series as well.^{1,2,4} The most feared complication of colonic perforation during the procedure is in fact a very rare problem if the cases are carefully selected and the right technique used.^{2,5} Experimental studies have shown that there is no danger of reducing gangrenous gut at the pressure recommended.²

A success rate of 60–70% is reported in most series.^{1,2,4} This is a very acceptable result, and it means that two out of three patients would avoid a major operation with its attending operative and anaesthetic risks. The 5% risk of intestinal obstruction secondary to adhesions following laparotomies is an added reason to avoid surgery if possible.

There is usually not much delay encountered in performing the enema reduction before laparotomy. Whatever delay there is does not significantly increase the morbidity following surgery. In fact, a failed enema reduction is still of some benefit in pushing the intussusception to the right

iliac fossa where it is easily accessible through the incision, and hence makes manual reduction much easier.

The equipment required for this procedure is relatively simple and cheap. The length of hospital stay is shortened significantly and this will effectively reduce cost, not to mention the psychosocial trauma of hospital stay.

The recurrence rate following enema reduction is not higher than manual reduction.² In fact, the same procedure can be used again for the recurrences.

ACKNOWLEDGEMENT

I would like to thank the Radiologists in Universiti Kebangsaan Malaysia and General Hospital, Kuala Lumpur for their help rendered.

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