TREATMENT OF RECTAL PROLEPSES IN INFANTS AND CHILDREN WITH INJECTION OF HYPERTONIC SALINE

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Abstract

Objectives: The aim of this study is to determine the efficacy of submucosal injection of 30% hypertonic saline solution in treatment of partial rectal prolapse in infants and children.

Subjects & Methods: One hundred patients of partial rectal prolapse in infants and children were treated with 30% hypertonic saline injection into the submucosal layer at the Department of General Surgery in the University Hospital of Iraqi College of Medicine during the period from October 1998 to October 2002. Ninety two patients were treated in the outpatient while the other 8 patients were treated as day cases under general anesthesia.

Results: Seventy-three patients were males and 27 were females with a male-to-female ratio of 2.7:1. The age ranged from 6 months to 13 years, with the most common age of 1-3 years (74%). The duration of symptoms varied from 2 months to 2 years with 47% of patients presented within 2-3 months of initial compliant. Chronic diarrhea was the main precipitating factor (55%).
Ninety-four patients (94%) were cured by a single injection, 6 patients (6%) needed a second injection, while no patients needed a third injection. The overall success rate was 100%. There were no significant complications.

Conclusion: Injection treatment of partial rectal prolapse in infants and children using 30% hypertonic saline in submucosal layers is less invasive than operation, safe, easy, very effective and without any significant complications.
The simplicity of the injection treatment, availability of the sclerozing agent and the possibility of the treatment at the outpatient level are the main advantages of this treatment.

Key words: Rectal prolapse, Injection, Hypertonic saline

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Introduction

Rectal prolapse is known since 1500 B.C[1].It is defined as a circumferential descent or protrusion through the anus of one or more coats of the rectum. It is classified into two types, INCOMPLETE rectal prolapse (partial) where mucous membrane alone descends, and COMPLETE (full thickness) in which all coats of the rectum are involved, which rarely occurs in infants and children[2,3].

The partial prolapse is distinguished from complete prolapse (procidentia) by prolapsing of the rectal mucous membrane for a half inch to one inch from the anal verge with characteristic radiating folds while in the complete prolapse all coats of rectum protrude for two inches or more with characteristic circular folds[4].

The rectal prolapse can be managed conservatively, by injection or by operation[5-8]. The steps of management can be conveniently remembered as a memonic SEVEN's, the 1st 4S are conservative include stool, seat, sedation and strapping, and the last3S' are surgical include sclerosing agents injection, suturing and surgical operations.

The condition is regarded as being minor by surgeon but not by parents. Conservative measures have frequently failed and there are troublesome cases with frequent prolapse managed by manual reduction, thus an injection of a sclerosing solution into the rectal submucosa proved longstanding results and success in many centers[7,8].

Solutions can be used include 70% ethylalcohol, 5% phenol in almond oil[8,9] or hypertonic glucose[2,3,10,11] and in this study, hypertonic saline (30%) has been used[9,12-17]. Injection of hypertonic saline solution into the submucosal layer promotes a vigorous inflammatory reaction. In the immediate post-injection period, edema resulting from the injection provides mechanical support for the rectum to prevent prolapse. The edema disappears in 2-3 days and the resulting fibrosis of the perirectal tissue should prove adequate to prevent recurrence of the prolapse[15,18]. In spite of the proven efficacy of this simple treatment, elaborate operations base largely on adult experience continue to be advocated. These operations include subcutaneous perianal suture[18,19], linear

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cauterization of the mucosa[8,20], the Lockhart-Mummery operation and even pelvic floor repair[2,3,11,21-25].

Subjects & Methods

This is a prospective study of 100 patients with partial rectal prolapse who were treated at the Department of General Surgery in Al-Kadhimiya Teaching Hospital during the period from October 1998 to October 2002 with submucosal injection of hypertonic (30%) saline solution.

Ninety-two patients were treated in the outpatient while the other 8 patients were treated as day cases under general anesthesia. The six cases, who received second injection, were treated in outpatient .The requirements are 10ml. syringe, surgical gloves, 10 ml. of solution and an anal speculum. The rectum is emptied, short-term general anesthesia is required in eight patients and lithotomy position is preferable. About 7-8 cm. above the anal verge 2 ml. of 30% saline solution is injected into the submucosa at three sites around the circumference, one in the posterior midline and other two on each side. The injection can be performed under vision as in Figure 1 or by using a guiding finger in the rectum for a needle passed through the perianal skin as in Figure 2.

Post-injection, the patient is kept for observation for 1-2 hours and then allowed to go home with analgesics. Follow up examinations were made weekly for 4 weeks and afterward at longer intervals. If further injections are needed, they are usually given at the end of the third week. A maximum of 3 sessions can be given if necessary. The longest period of follow up was 4 years.

The following factors regarding rectal prolapse itself has been studied as well: the duration of the prolapse, the frequency of attacks, reducibility (spontaneous, manual or obstructed) and the type of prolapse.

Results

This study included a total of 100 patients with rectal prolapse, 73 patients were males (73%) and 27 were females (27%) with sex ratio 2.7: 1 (Table 1).

Sixteen patients were 6-12 moths of age, 74 patients were within the age of 1-3 years, 6 patients were 3-5 years and only 4 patients were more than 5 years old. The most common age of presentation was 1-3 years and the mean age was 2.2 years (Table 2).

Table 1: Sex distribution of patients with rectal prolapse

Sex	Male	Female
No. of patients	73	27
Percentage	73%	27%

*Sex ratio 2.7:1

Table 2: Age distribution of patients with rectal prolapse

Age	6-12 months	1-3 years	3-5 years	>5 years
No. of patients	16	74	6	4
Percentage	16%	74%	6%	4%

* The oldest patient was 13 years old.
* Mean age was 2.2 years.

Forty-seven patients presented to us within 2-3 months of initial complaint, (Table 3). Regarding the frequency of prolapse attacks, 48 patients had the prolapse every bowel motion (Table 4). Rectal prolapse was spontaneously reducible in 43 patients while manuale reduction was needed in 57 patients. No patient presented with irreducible prolapsed rectum (Table 5).

Table 3: Duration of rectal prolapse

Duration of prolapse	2-3 months	4-6 months	7-12 months	1-2 years
No. of patients	47	26	18	9
Percentage	47%	26%	18%	9%

Table 4: Frequency of attacks of rectal prolapse

Frequency of attacks	Occasional	Every 2-3 months	Every bowel motion
No. of patients	18	34	48
Percentage	18%	34%	48%

Table 5: Type of reduction of rectal prolapse

Type of reduction	Spontaneous	Manual	Irreducible (obstructed)
No. of patients	57	43	0
Percentage	57%	43%	0%

The tone state of the anal sphincter was assessed clinically by per rectum examination, 42 patients had normal sphincter tone while 58 patients had relaxed sphincter (Table 6).

Table 6: State of anal sphincter in patients with rectal prolapse

State of anal sphincter	Relax	Normal
No. of patients	58	42
Percentage	58%	42%

Precipitating factors for the attacks of rectal prolapse were diarrhea mainly chronic type in 55 patients, constipation in 34 patients and chronic respiratory tract infection in11 patients. Thus diarrhea was the major precipitating factor (Table 7).

Table 7: Factors precipitated the attacks of rectal prolapse

Factors precipitated the attacks	Diarrhea	Constipation	CRTI*
No. of patients	55	34	11
Percentage	55%	34%	11%

*CRTI = Chronic respiratory tract infection

All patients included in this study had partial prolapse. Of the 100 patients of prolapsed rectum who received injection treatment, 85 patients had no further prolapse after first injection, while 9 patients had transient attacks of prolapse that stopped soon after without more injections; making 94 of 100 patients required no further treatment. Prolapse recurred in 6 patients, surprisingly long after treatment (Figure 3), suggesting that faulty technique was not responsible. Those 6 patients were cured by a second injection in outpatient No child needed a third injection.

Complications, including rectal stenosis, perirectal abscesses, urine retention and bleeding were not recorded in this series. One of patients had recurrence after Thiersch's operation also received injection treatment successfully. Nine patients were missed after the first injection, thus were not included in this study.

Discussion

Rectal prolapse is found to affect mostly children of 6-36 months of age; the majority of them are males[3]. This age is the time for toilet training, and because the child in this age is hyperkinetic, he (or she) spends little time during the act of defecation. Therefore; a little time is permitted for molding of stool by pelvic floor muscles[10].

The most common age group in our study was 1-3 years (73%) which is comparable to many other studies[2,3,11-16,21], on the other hand, Groff et al (1990)[18] showed that the most common age group is more than 2 years.

In our study males were affected more than females (2.7:1), like other studies[9,12-16,18]. This may be due to the fact that males are more hyperkinetic in this age than females. In some studies the incidence of occurrence in females is more than in males[5,25] while Marvin (1985)[21] showed an equal incidence .

Diarrhea is the main precipitating factor of rectal prolapse in our study (55%) as in other studies[2,5,12-14,25], this can be explained by the fact that diarrhea leads to loss of weight and consequent diminution of fat in the ischio-rectal fossa[2] and lack of rectal support[3,5,11,26]. On the other hand, constipation is the main cause of rectal prolapse in other studies[11,25], this can be due to an increase in the intra-abdominal pressure and straining effort during defecation which may lead to prolapse of rectum. Like other studies, 47% of the patients in our study presented within 2-3 months of initial complaint[14,25].

Norman (1995)[2] and Scott (1979)[3] showed that the majority of the prolapse was reduced spontaneously, while our study showed that manual reduction of prolapse was used in 57% of our patients and spontaneous reduction occurred in 43%, this may be attributed to that parents consider spontaneous reduction of rectal prolapse is a self-limiting problem and they do not need to seek a medical advise till the prolapse becomes manually reducible. Furthermore, most of mothers are afraid of manual reduction since the prolapsed rectum bleeds when it touches the underwear. This makes the parents seek a medical advice rapidly.

In our study, treatment of rectal prolapse by submucosal injection of (30%) hypertonic saline has a successful result in 94% of the patients after the first injection and 100% after the second

injection. The overall success rate in our study was 100%. A third injection was not needed in any patient.

Kayan Zachary[15] reported 51 patients of rectal prolapse treated by the injection of 30% saline, of whom 11 patients (21.56%) required a second injection, 3 patients (5.88%) of them required a third injection.

Dutta[16] reported 30 patients of rectal prolapse that received 30% saline injection treatment, 25 patients (83.4%) were cured by the first injection, 4 patients (13.3%) needed a second injection, while only one patient (3.3%) needed a third injection.

The reported complications after injection therapy are[9,14-16]:

1. Rectal stricture.
2. Perirectal abscess.
3. Urine retention.
4. Damage to the nerve supply of the bladder, if injection was done too far in front of the rectum.

These complications were not encountered in our patients.

Comparison of success rate of injection in our study with that in other studies using the same agent or other is shown in Table 8. The difference in success rate in various studies may be due to the type of sclerosing agents and its effects on pararectal tissues in producing inflammatory reaction.

Table 8: Comparison of success rate after injection treatment in different studies

The study	Type of sclerosing agent	Success rate
Kayon Zachary (1970)[15]	30% saline	100%
Dutta (1977) [16]	30% saline	100%
Wrman (1985) [21]	30% saline	100%
Wyllie (1979) [9]	5% phenol in almond oil	100%
Malyshev (1973) [14]	70% alcohol	96%
Fehri (1988) [5]		98%
Our study	30% saline	100%

Conclusions

Injection treatment of partial rectal prolapse in infants and children using 30% hypertonic saline in submucosal layers is less invasive than operation, safe, easy, very effective, and without any significant complications.

Recommendations

1. The major cause of rectal prolapse in Iraqi children is diarrhea associated with weight loss, so the prevention and treatment of diarrhea and the improvement of nutrition can decrease the Incidence of rectal prolapse.
2. Children with rectal prolapse should be treated at an early stage by means of an injection, in order to reduce the discomfort of recurrent manipulative reductions of the prolapse in the child and alleviate the anxiety of the parents.
3. The use of submucosal injection of hypertonic saline (30%) gives excellent success rate in the treatment of rectal prolapse in infants and children and can be used as an alternative to the 5% phenol in almond oil or other sclerosants because it is available, cheaper, easily prepare and does not need special syringe for injection.

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