

## Measurement Of Intra Luminal Pressure Required To Reduce Intussusception By Hydrostatic Reduction: Case Study Of 32 Patients

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**Background:** Reduction of intussusceptions under ultrasound guidance by saline has become popular in recent years. The conventional hydrostatic reduction of an intussusceptions with barium enema or the pneumatic reduction of an intussusceptions is associated with considerable ionizing radiations and risk of perforation; while the hydrostatic reduction of an intussusceptions under ultrasound guidance is very safe method because the whole procedure is visualized with real time ultrasound. Also, being a non-invasive method with a high success rate, this procedure has emerged as a useful alternative to a surgical intervention. The aim of this study was to evaluate the intra luminal pressure required to reduce intussusceptions by ultrasound guided saline enema.

**Subjects and Methods:** 32 cases of intussusceptions were diagnosed with ultrasonography. US-guided saline hydrostatic reduction was performed for measurement of intra luminal pressure in two year study which was conducted in the Department of Surgery, MGM Medical College and Hospital, Aurangabad from October 2012 to October 2014.

**Conclusion:** Hydrostatic reduction of intussusceptions avoids radiation exposure. It is reliable and safe. It has high success rate and minimal complications. It is a perfect method for the non operative treatment of pediatric intussusception and can be widely used as routine therapy, with study suggesting 121.87+/- 16.93 cm is the mean intra-luminal pressure required to reduce intussusceptions.

**Keywords:** Intussusception, hydrostatic, reduction, ultrasound.

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**Background-** An intussusception is a surgical condition in which a part of the intestine has invaginated into another section of intestine, similar to the way in which the parts of a collapsible slide into one another. This can often result in an obstruction.

It is the most common abdominal emergency in early childhood, particularly in children younger than two years of age.

Intussusception is unusual in adults, a pathogenic cause is identified. In contrast the majority of cases in children are idiopathic.

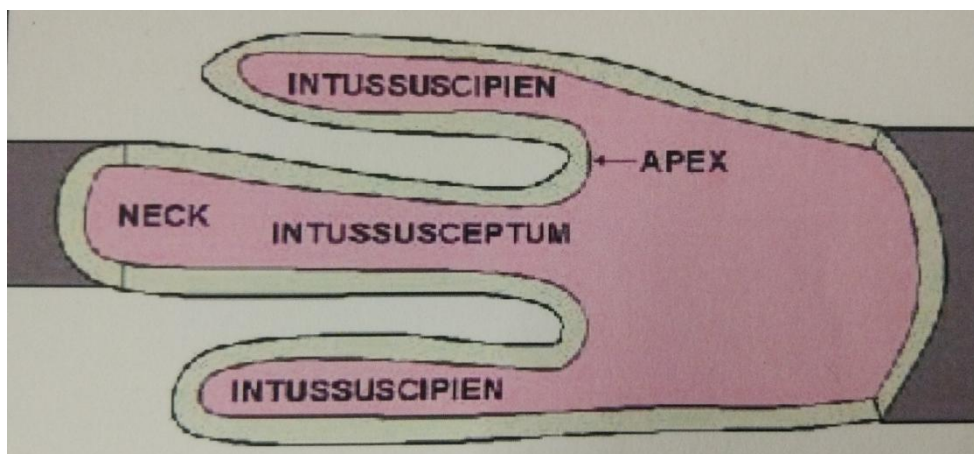
Treatment of intussusception by hydrostatic pressure dates back to the days of Hippocrates, who recommended the use of enemas in all forms of ileus. The installation of effervescent powder and the administration of hydrogen sulphide in the colon and retrograde passage of bougies are examples of ancient methods of intussusceptions reduction.

In 1876 Hirschsprung reported his experience with the treatment of intussusceptions by enema.

The first successful surgical correction of an intussusceptions in an infant was described in 1871 by Hutchison.

The parts include- 1) Intersseptum- The proximal part 2) Interssucepiens- The distal part

The part that prolapses into the other is called intussusceptum, and the part that receives it is called the interssucepiens.



The most common type of intussusceptions is ileocolic that is 90%. The majority of intussusceptions are idiopathic. An anatomical lead point occurs in approximately 10% of intussusceptions.

**Methods-** 32 cases of intussusceptions were diagnosed with ultrasonography. US-guided saline hydrostatic reduction was performed for measurement of intra luminal pressure in two year study which was conducted in the Department of Surgery, MGM transducerMedical College and Hospital, Aurangabad from October 2012 to October 2014. Criteria for inclusion were age 0-18 yrs with no prior surgical intervention with absence of generalized toxicity and absence of signs of peritonitis

Foleys catheter (16-18F) was introduced per rectally upto Y mark, with child in lithotomy position. IV set connected to Foleys catheter. An enema –can filled with 500ml of normal saline which was at room temperature was kept at a height of 100cm above table top. The normal saline from the enema-can was instilled into the rectum and the movement of the fluid column was followed up to the mass under ultrasound guidance. The reduction was studied under the guidance of ultrasonography by using a 5-10MHz. The movement of the tip of the intussusceptum was constantly observed upto the caecum and the ilio-caecal valve until a complete hydrostatic reduction as achieved. Before removing the Foley’s catheter an ultrasound examination was carried out to confirm the complete reduction of intussusceptions and rule out the leakage of fluid into the peritoneum. Childrns were kept nil orally for 4 hours in PICU. A follow up ultrasound was performed after 24 hours to rule out any recurrence.

**Results-** A total 32 patients studied for measurement of intra luminal pressure required to reduce intussusceptions by hydrostatic reduction were studied under following various categories.

Table -1 Distribution of patients according to Gender

| Gender | No. of Patients | Percentage |
|--------|-----------------|------------|
| Male   | 24              | 75.0%      |
| Female | 08              | 25.0%      |
| Total  | 32              | 100%       |

Table-2 Distribution of patients according to age group

| Age-Group | No. of Patients   | Percentage |
|-----------|-------------------|------------|
| < 1 year  | 19                | 59.38%     |
| 2-5 year  | 08                | 25.0%      |
| 6-8 year  | 05                | 15.62%     |
| Total     | 32                | 100%       |
| Mean +-SD | 2.14+- 2.38 years |            |

Table-3 Distribution of patients according to Symptoms

| Symptoms        | No. of patients | Percentage |
|-----------------|-----------------|------------|
| Pain in Abdomen | 32              | 100%       |
| Vomitting       | 04              | 12.5%      |
| Blood in stools | 08              | 25.0%      |
| Diarrhoea       | 08              | 25.0%      |
| Constipation    | 02              | 6.25%      |

**Table-4** Distribution of patients according to Intra-Luminal Pressure

| Intra-Luminal Pressure | No. of patients | Percentage |
|------------------------|-----------------|------------|
| 110-110                | 12              | 37.5%      |
| 111-120                | 07              | 21.87%     |
| 121-130                | 05              | 15.62%     |
| 131-140                | 02              | 7.5%       |
| 141-150                | 06              | 18.5%      |
| Total                  | 32              | 100%       |
| Mean +-SD              | 121.87 +-16.93  |            |

Intra luminal pressure appears to be a promising marker for reduction of intussusceptions in patient without any lead points. Patients with clinical signs and symptoms of intussusceptions and which are diagnosed sonographically without any lead points with small intussusceptions segment early diagnosed cases should undergo USG guided hydrostatic reduction with mean intraluminal pressure of 121.87+- 16.93 cm suggesting 121.87+-16.93cm is the mean intra-luminal pressure required to reduce intussusceptions.

**Results-** 1) Mean intra luminal pressure appears to be a new promising reducibility criteria for hydrostatic reduction of intussusceptions.

2) Successful reduction of intussusceptions hydrostatically under USG guidance with the mean intra luminal pressure. Suggesting 121.87+-16.93cm is mean intra luminal pressure required to reduce intussusceptions.

\*Girish Gumaste. "Measurement Of Intra Luminal Pressure Required To Reduce Intussusception By Hydrostatic Reduction: Case Study Of 32 Patients." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 16.7 (2017): 85-87.