



ESPR 2019
55TH ANNUAL MEETING &
41ST POST GRADUATE COURSE OF
THE EUROPEAN SOCIETY
OF PAEDIATRIC RADIOLOGY



Transition from fluoroscopically-guided barium-reduction of ileocolic intussusception to sonographically-guided water-reduction in a tertiary paediatric Hospital.

Cristina Hernandez Hernandez, Catalina Le Cacheux, Rocío Vizcaíno, Israel Fernández, Pablo Caro-Domínguez.

Hospital Universitario Virgen del Rocío, Sevilla, Spain.



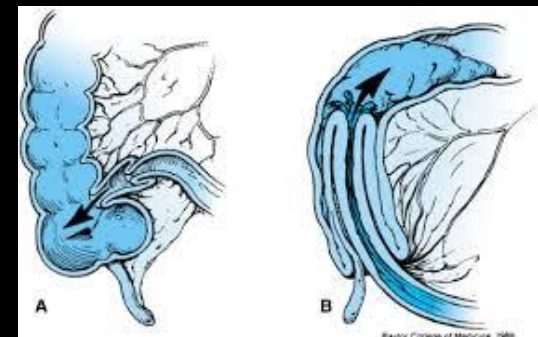
The authors have no disclosures

Introduction

Ileocolic intussusception is a common cause of intestinal obstruction in children between 3m - 3y that can be treated non-surgically

Diagnosis is usually established with ultrasound. However, there are multiples ways to monitor the non-surgical reduction

In our institution, we changed from fluoroscopically-guided barium-enema reduction to ultrasound-guided water-reduction two years ago



Aim

To evaluate the performance of ultrasound-guided water-reduction for ileocolic intussusception in a tertiary paediatric Hospital in Spain and compare it with:

1. Our previous experience with fluoroscopically-guided barium-reduction
2. The literature

Materials and methods

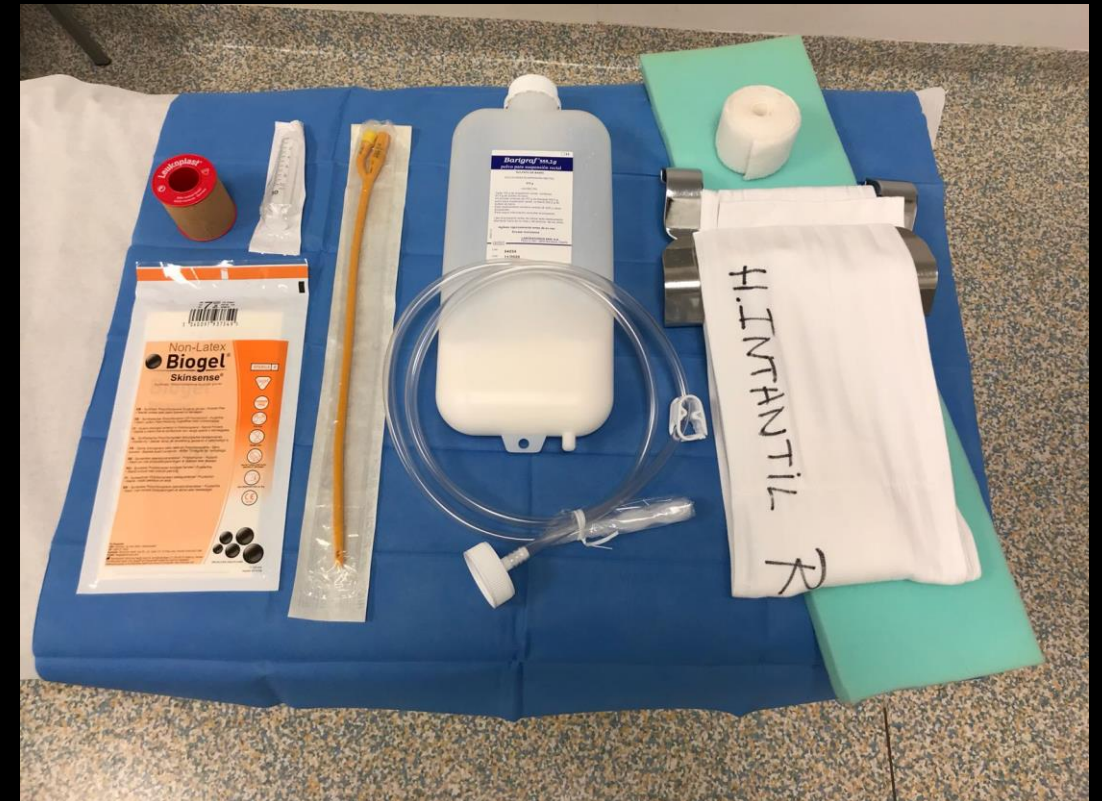
- Single institution study
- Separated blinded retrospective review by a paediatric radiologist and a paediatrician of PACs images and medical charts
- Four years and 4 months:
 - Jan/15 - Dec/16: fluoroscopically guided reduction
 - Jan/17 - Apr/19: US guided reduction
- Studies were performed by a group of 10 radiologists with experience on paediatric radiology on call
- Statistical analysis (Excel, SPSS)

Materials and methods



Fluoroscopically-guided barium-reduction:

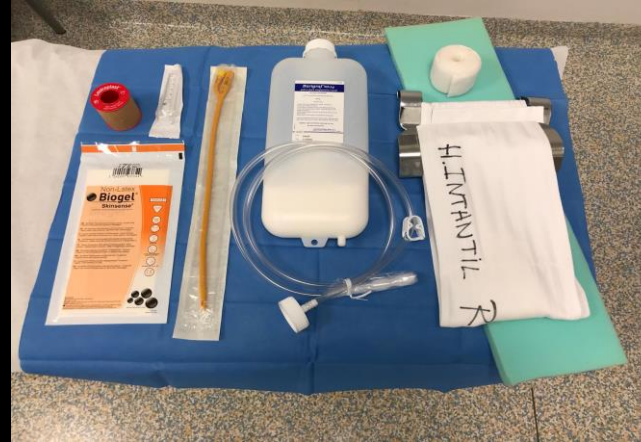
1. Standard fluoroscopy machine
2. Nursery gently insert a Foley catheter and inflate the balloon
3. Tape firmly the system to avoid leaks
4. Instillation of 1-1.5 L of barium preparation
5. Progressive filling from an elevated bottle
6. No sedation used



Materials and methods

Ultrasound-guided water-reduction:

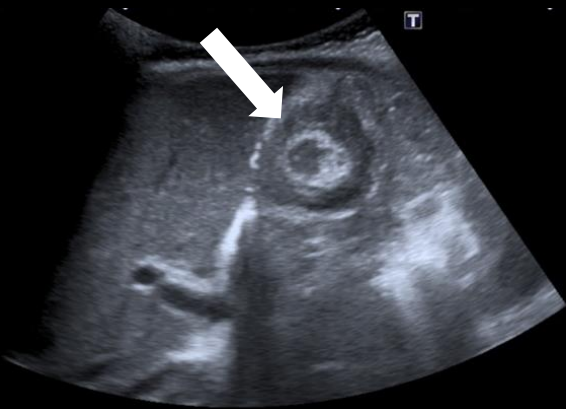
1. Two standard US machines, Canon and Philips were used for all sonographic exams with standard curvilinear and high-frequency probes
2. Nursery insert a Foley catheter and inflate the balloon
3. Tape firmly the system to avoid leaks
4. Instillation of 1-1.5 L of warm water
5. Progressive filling from an elevated bottle
6. If sedation (ketamine) is needed:
 - Monitoring alarm
 - Oxygen nasal cannula
 - Venous line



Results

Successful reduction with fluoroscopically guided-barium enema

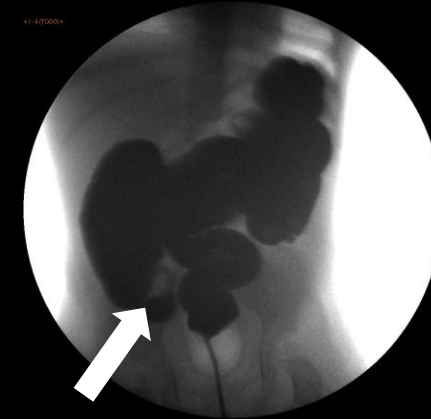
Ultrasound diagnosis of intussusception



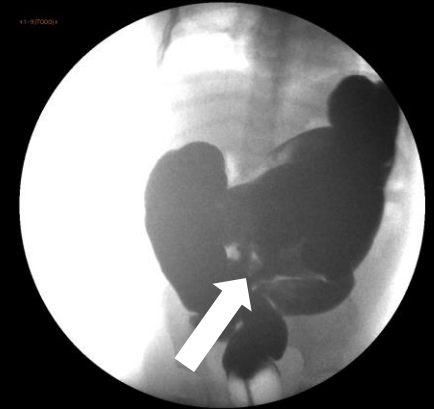
Barium filling the rectum



Barium filling the colon delineating the intussusception



Barium refluxing in the terminal ileum

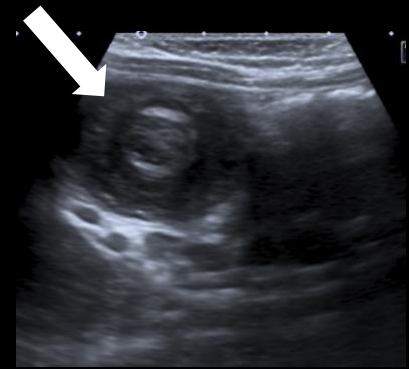


9-month-old baby girl with 6 hour history of abdominal pain

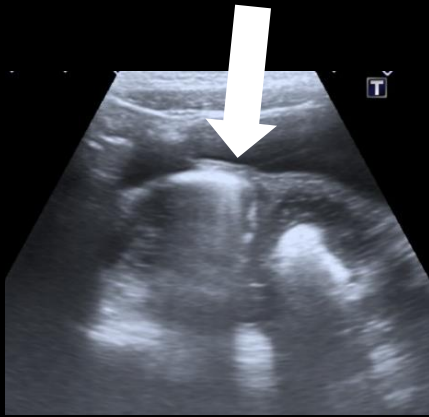
Results

Successful procedure with ultrasound-guided water-reduction

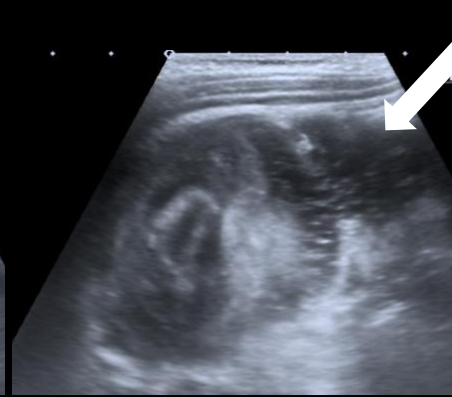
Ultrasound diagnosis
of intussusception



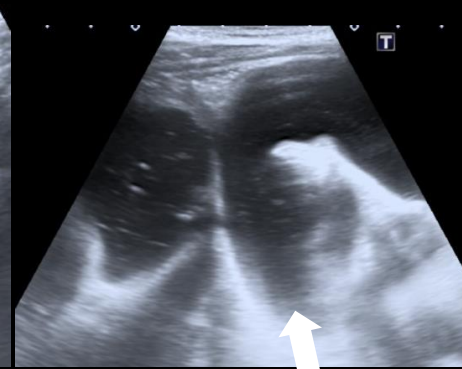
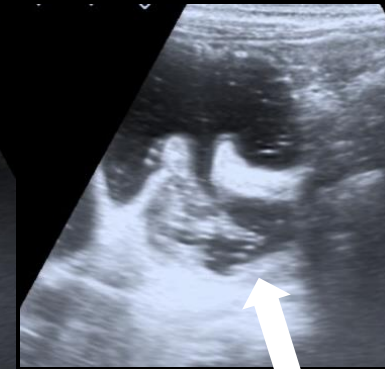
Water in the rectum



Water pushing the intussusception
in the RLQ



Water refluxing in the
terminal ileum



2-year-old girl with 4 hour history of abdominal pain and blood in the stool

Results

	Fluoroscopic reduction	US reduction
Total	33 reductions (28 patients)	38 reductions (33 patients)
Success rate	61%	76%
Recurrence	5 times (15%)	7 times (18%)
Perforation	0	0
Need of surgery	39%	24%
Ischemia at surgery	0	1
Interval between start symptoms and reduction	21 hours	18 hours
Lead point	1	0

Discussion

	Fluoroscopic reduction	US reduction
Total	33 (28 pat)	38 (33 pat)
Success rate	61%	76%
Recurrence	15%	18%
Perforation	0	0
Need of surgery	39%	24%
Isquemia	0	1
Time	21 h	18 h

Literature research:

- Success rates with conservative therapies: 70-85% ⁽¹⁾
- Recurrence rates 10% ⁽¹⁾
- Perforation rates 0.39% vs 0.43% ⁽²⁾

(1) Carrol AG (2017) Comparative Effectiveness of Imaging Modalities for the Diagnosis and Treatment of Intussusception: A Critically Appraised. *Acad Radiol*;24(5):521-529.

(2) Shen G (2018) Risk factors for short-term recurrent intussusception and reduction failure after ultrasound-guided saline enema. *Pediatric Surgery International*;34:1225-1231.

Limitations of the study:

- Sample size
- Sedation was not used in fluoroscopic procedures
- Learning curve
- Different experience of nursery

Take home message



- Non-surgical reduction of intussusception can solve the problem in up to 85% of cases
- US- guided water reduction has advantages: no radiation, decrease of time, availability
- In our Hospital:
 - We have increased reduction success rate since we have changed to ultrasound-guided water-reduction, and have managed to be at literature rates.
 - We still have work to do to improve our success rates (increase our number of patients and experience)
- A good tapering of the catheter and experienced staff are crucial for a successful reduction

Thanks for your attention.



Kiitos!