

Surgical treatment of idiopathic constipation



Children's Hospital Colorado

INTERNATIONAL CENTER FOR
**COLORECTAL AND
UROGENITAL CARE**



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Guidelines

Management of idiopathic constipation



Step 1

Fecal disimpaction / clean out

Enemas, Manual, NG-PEG

Step 2

Laxative trial

Senna

Step 3

Rectal enemas

Saline + glycerin + castile soap

Step 4

Long-term follow up

Risk of fecal impaction

Step 5

Weaning or stopping the laxative or enema

Slow and frequent failures

Step 6

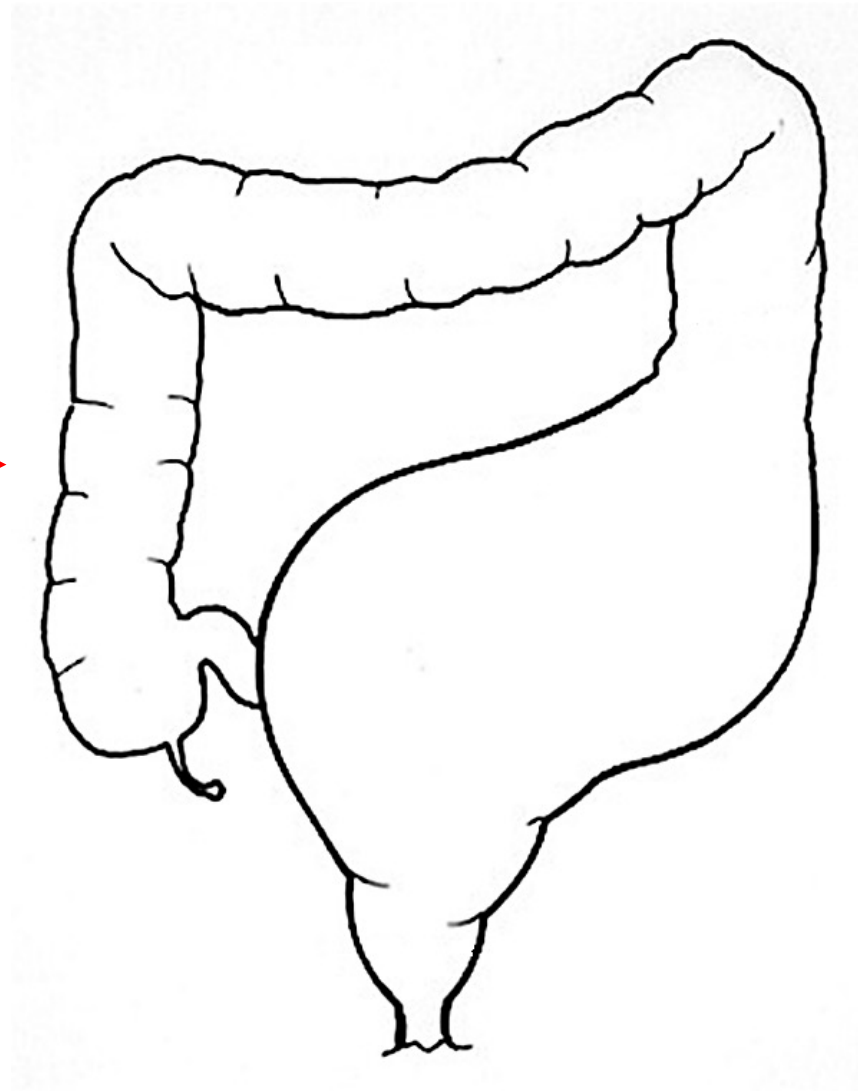
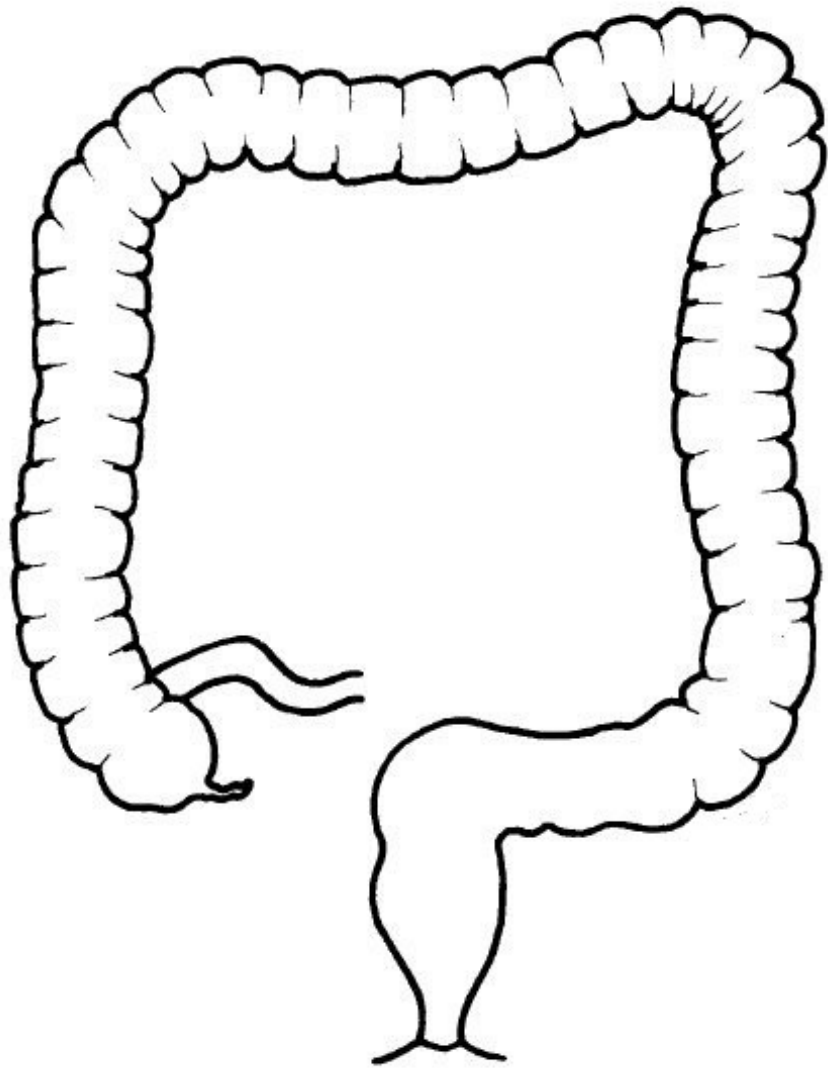
Surgical treatment

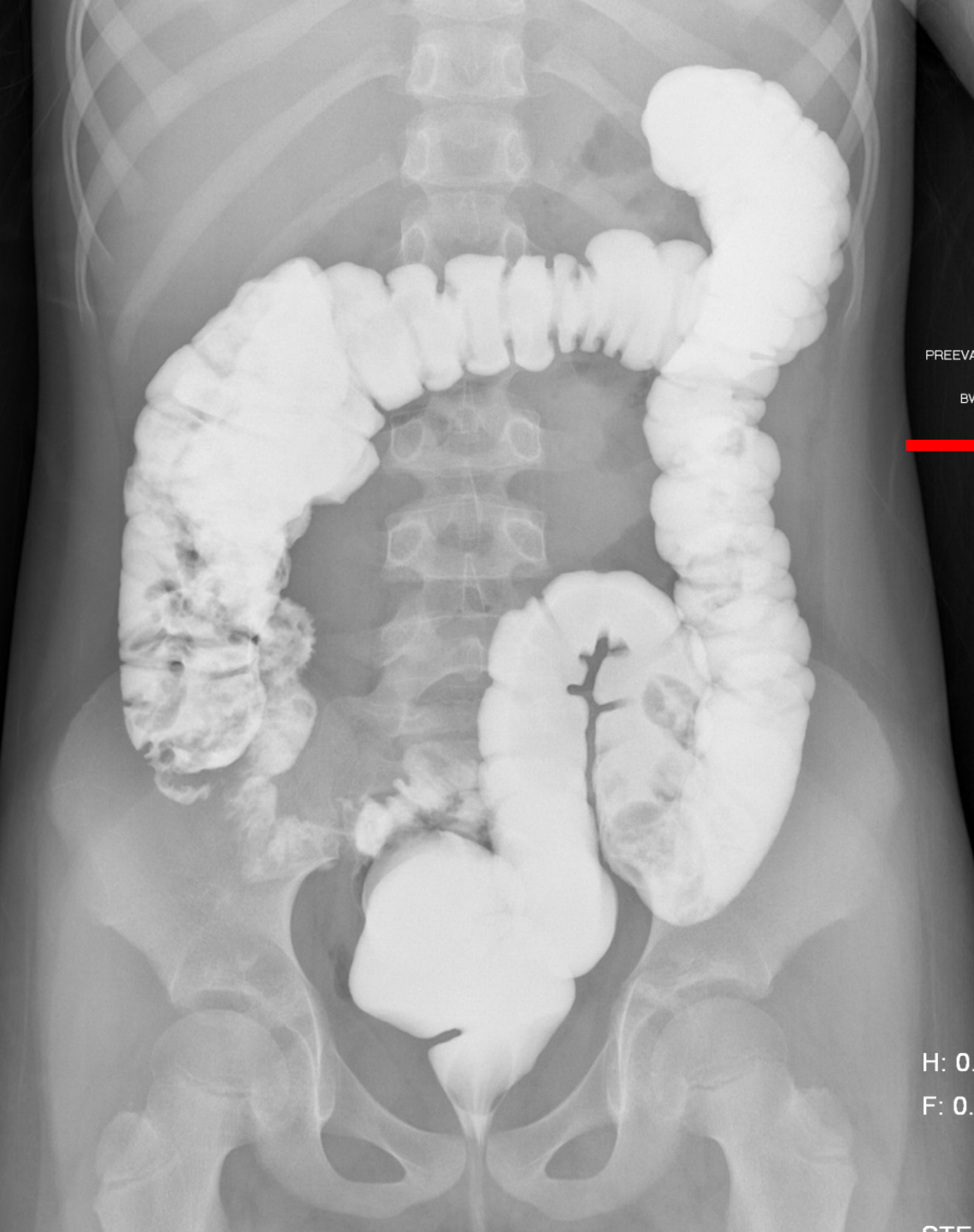
ACE, resection, enterostomy

Bowel Management Long-Week



Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Contrast enema	Workshop & Clinic	Practice & Trial period	Practice & Trial period	Trial period	Trial period	Trial period	Trial period	Clinic
	Evaluation & initiation of plan			X-ray	X-ray	X-ray	X-ray	X-ray
				email or call with report before 10 AM	email or call with report before 10 AM	email or call with report before 10 AM	email or call with report before 10 AM	Discuss final plan for future
				MD/RN discussion	MD/RN discussion	MD/RN discussion	MD/RN discussion	
				RN or MD call patient with adjustments	RN or MD call patient with adjustments	RN or MD call patient with adjustments	RN or MD call patient with adjustments	





Surgical Management of Idiopathic Constipation



- Sphincter myectomy
- Sphincter myotomy
- Botulin toxin (Botox) injection
- Anal dilations
- Ileostomy
- Colostomy
- Pull-through
- Partial resections
- Sub-total colectomies
- Colectomy
- Cecostomy
- Appendicostomy
- Neo-appendicostomy
- Left Colostomy button

Cheng and Goldstein. Surgical Management of Idiopathic Constipation in Pediatric Patients. Clin Colon Rectal Surg 2018;31:89–98.

Siminas and Losty. Current Surgical Management of Pediatric Idiopathic Constipation. A Systematic Review of Published Studies. Annals of Surgery Volume 262, Number 6, December 2015

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Surgical Management of Idiopathic Constipation



Sphincter myectomy

Sphincter myotomy

Botulin toxin (Botox) injection

Anal dilations

Ileostomy

Colostomy

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Partial resections

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Appendicostomy

Neo-appendicostomy

Left Colostomy button

Cheng and Goldstein. Surgical Management of Idiopathic Constipation in Pediatric Patients. Clin Colon Rectal Surg 2018;31:89–98.

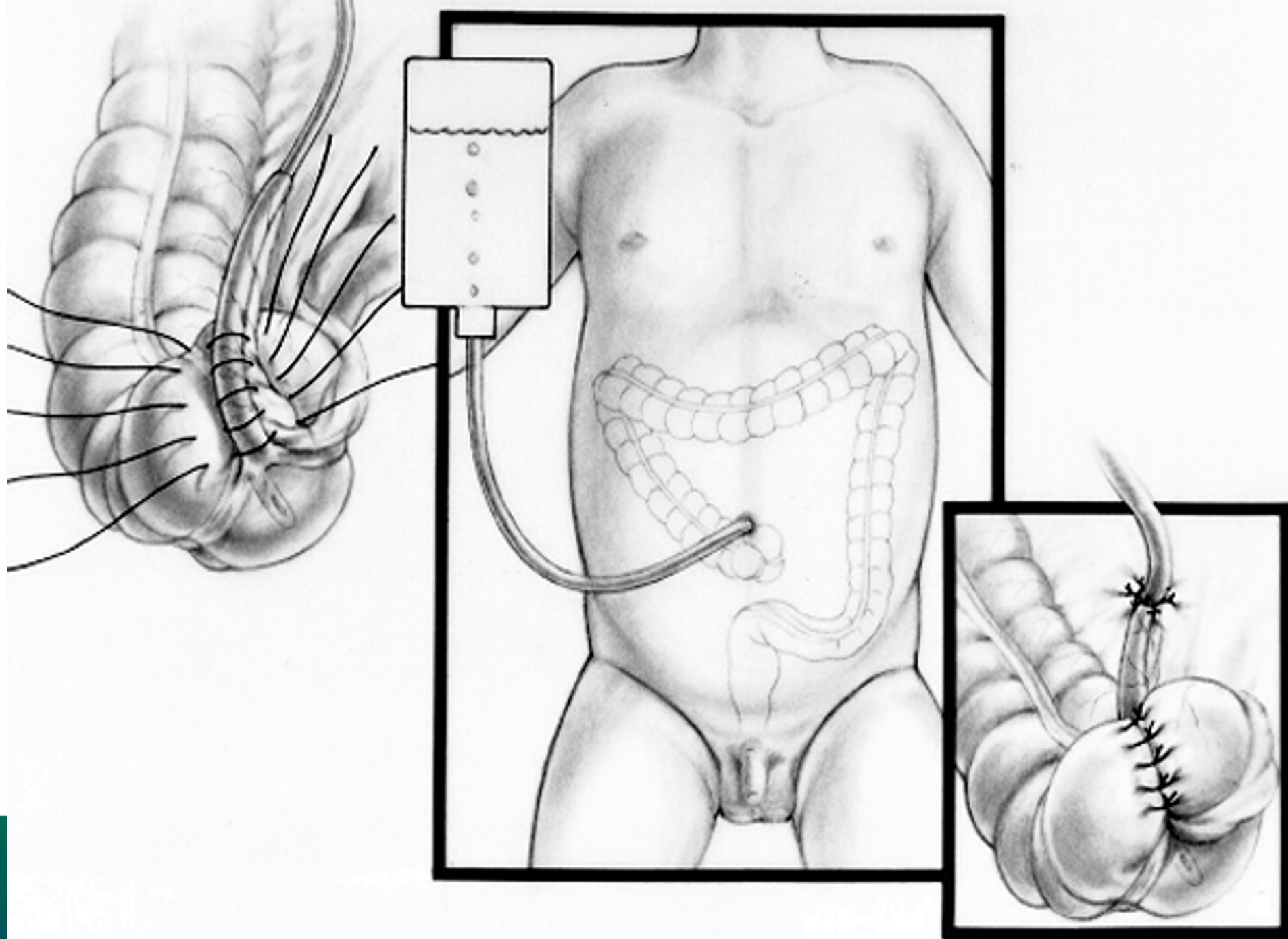
Siminas and Losty. Current Surgical Management of Pediatric Idiopathic Constipation. A Systematic Review of Published Studies. Annals of Surgery Volume 262, Number 6, December 2015

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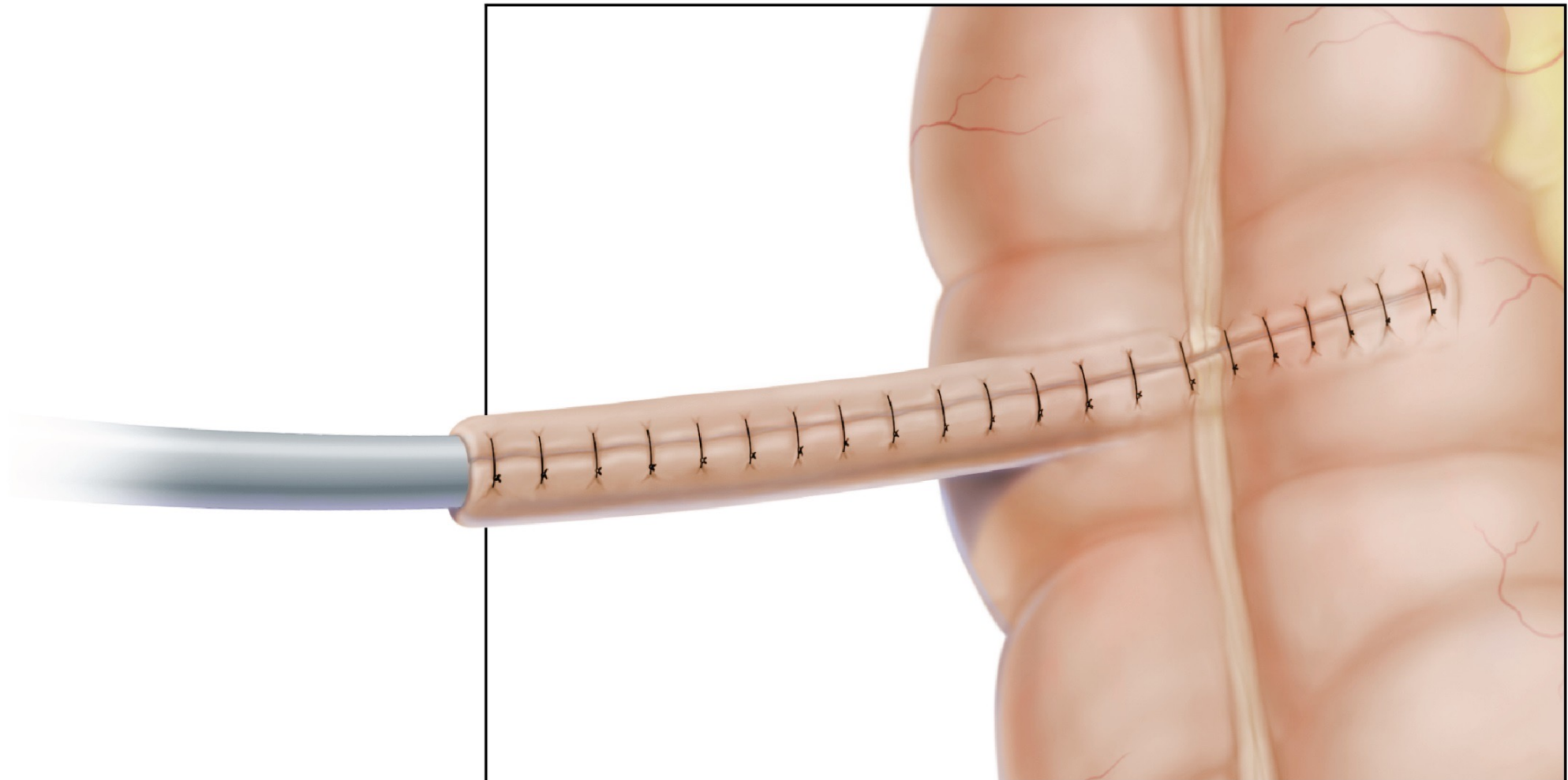
ACE

Antegrade Continent Enema



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ARE

Neo-appendicostomy

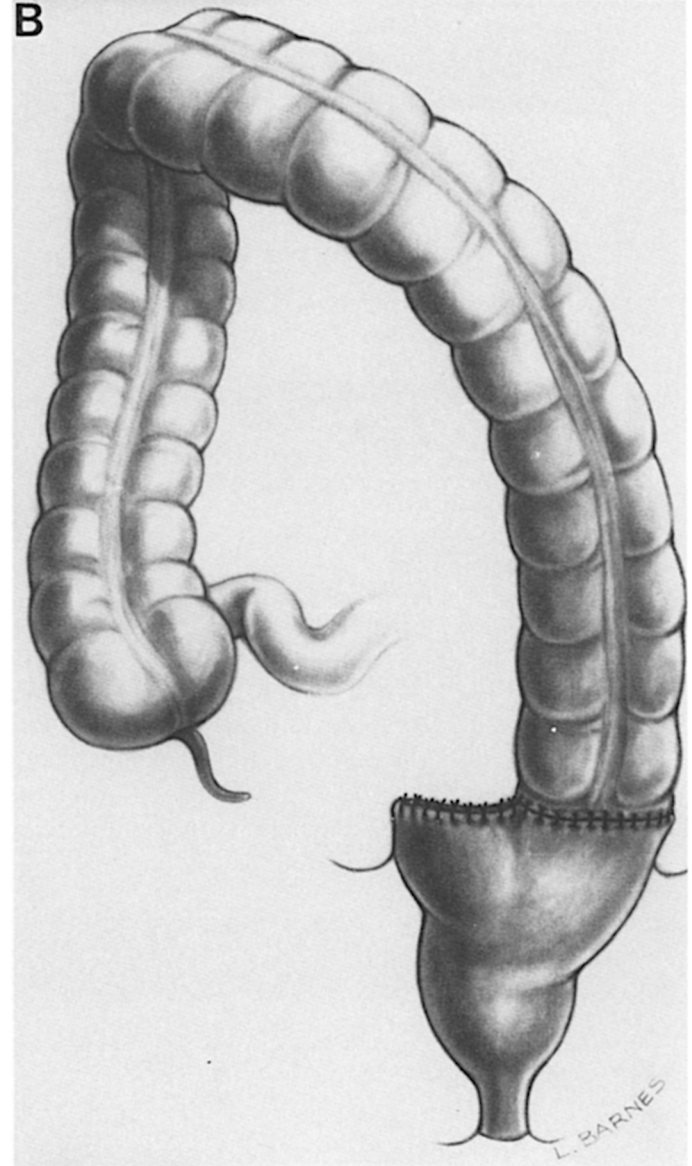
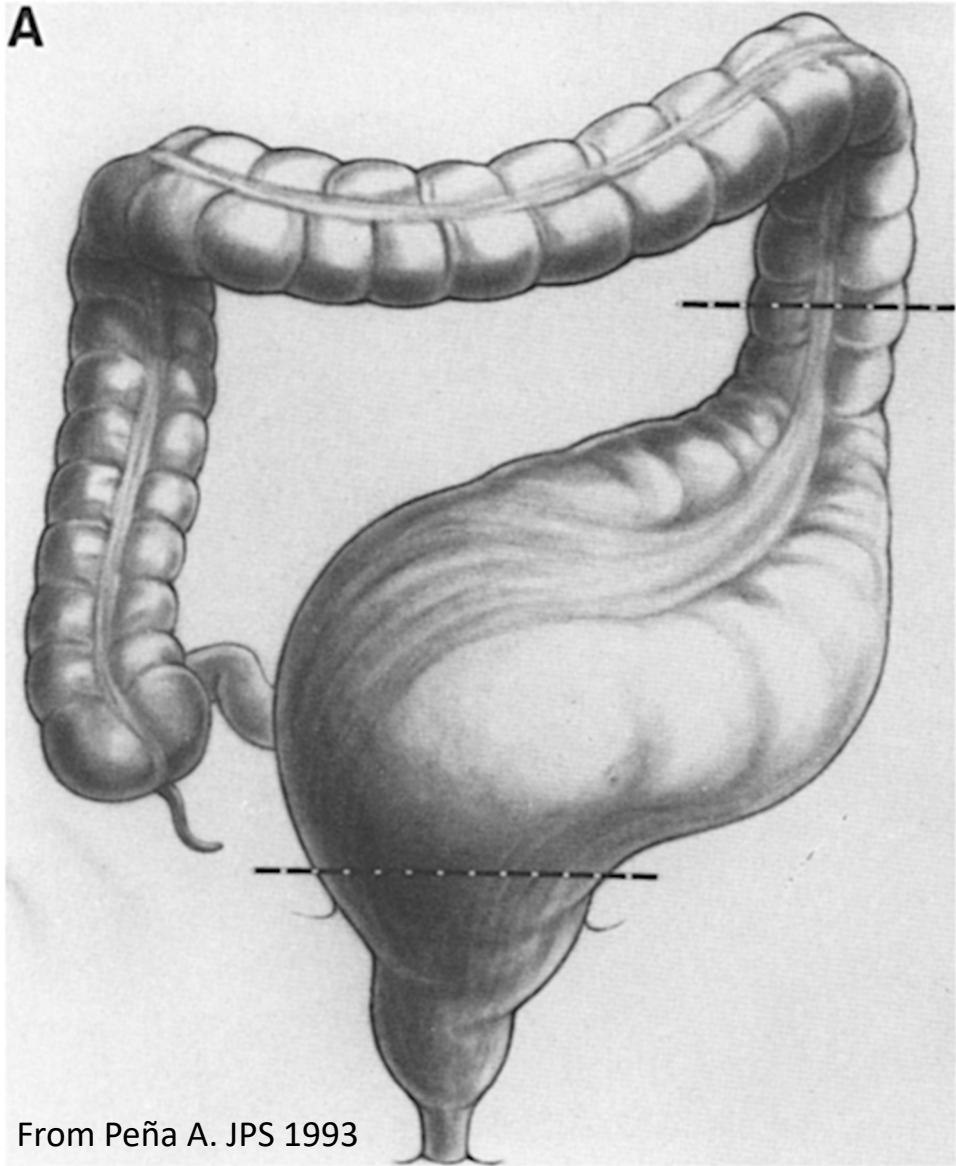




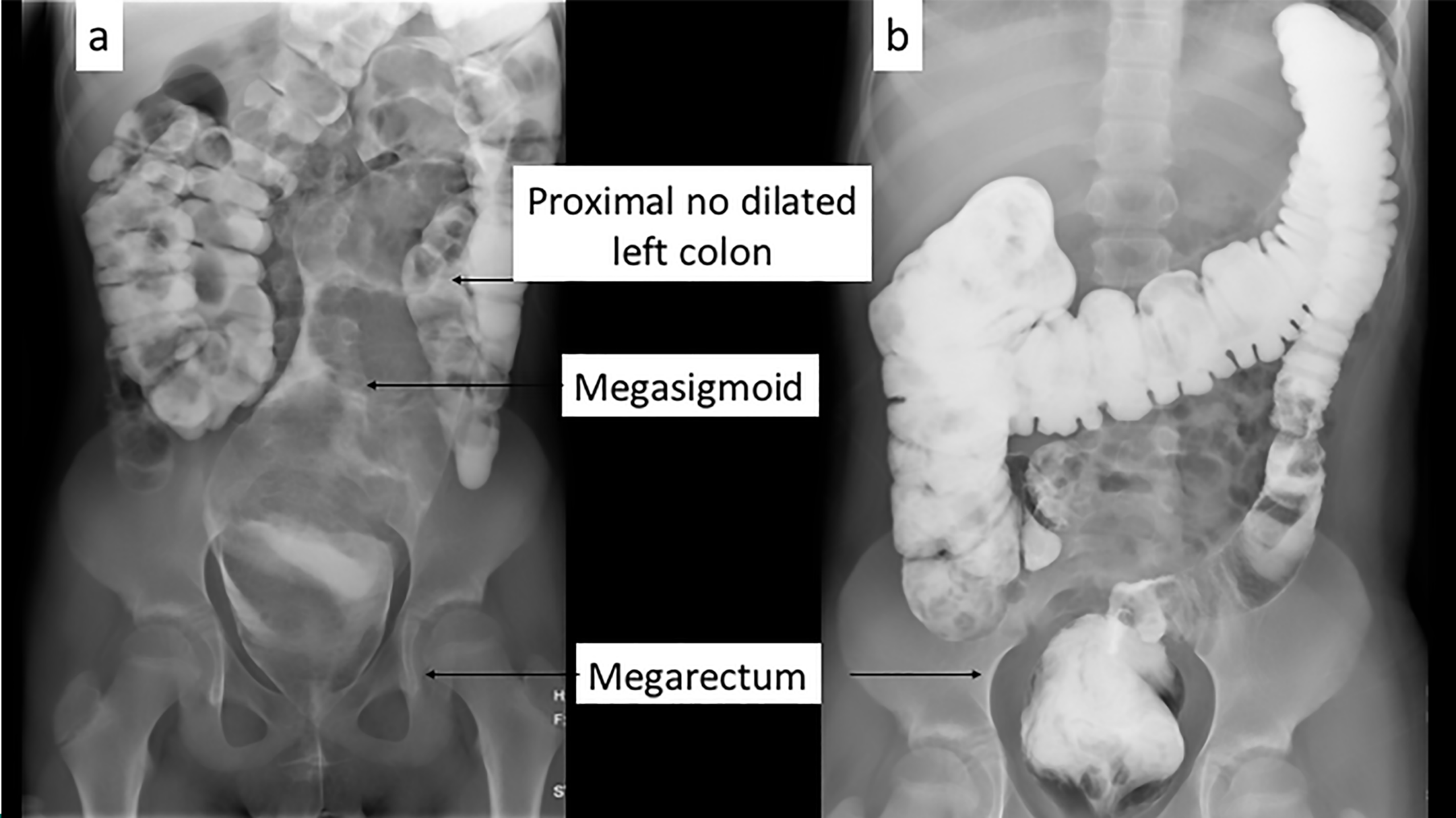




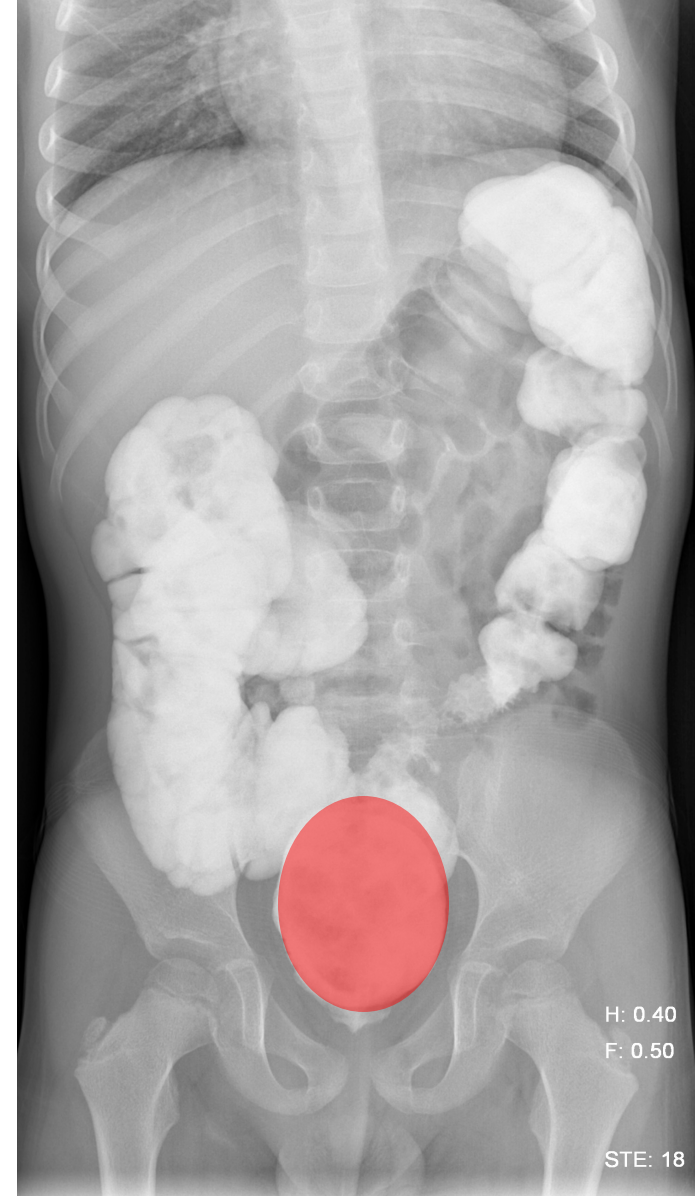
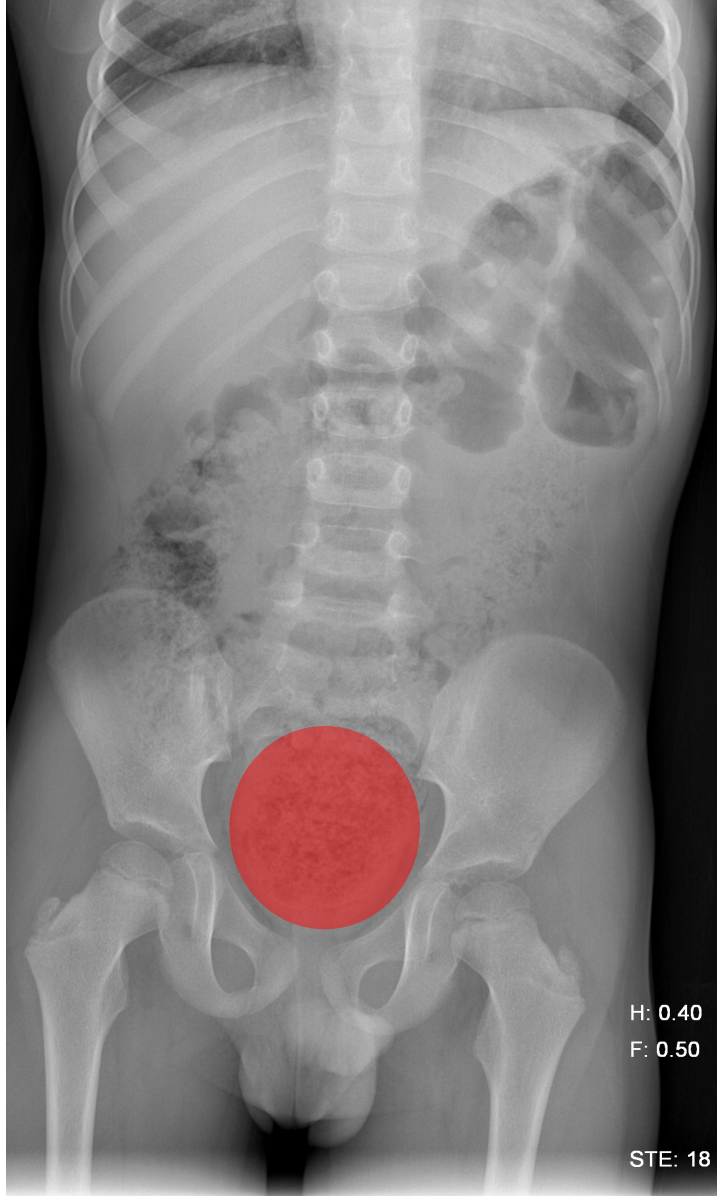
Sigmoidectomy



Sigmoidectomy



Sigmoidectomy



Sigmoidectomy

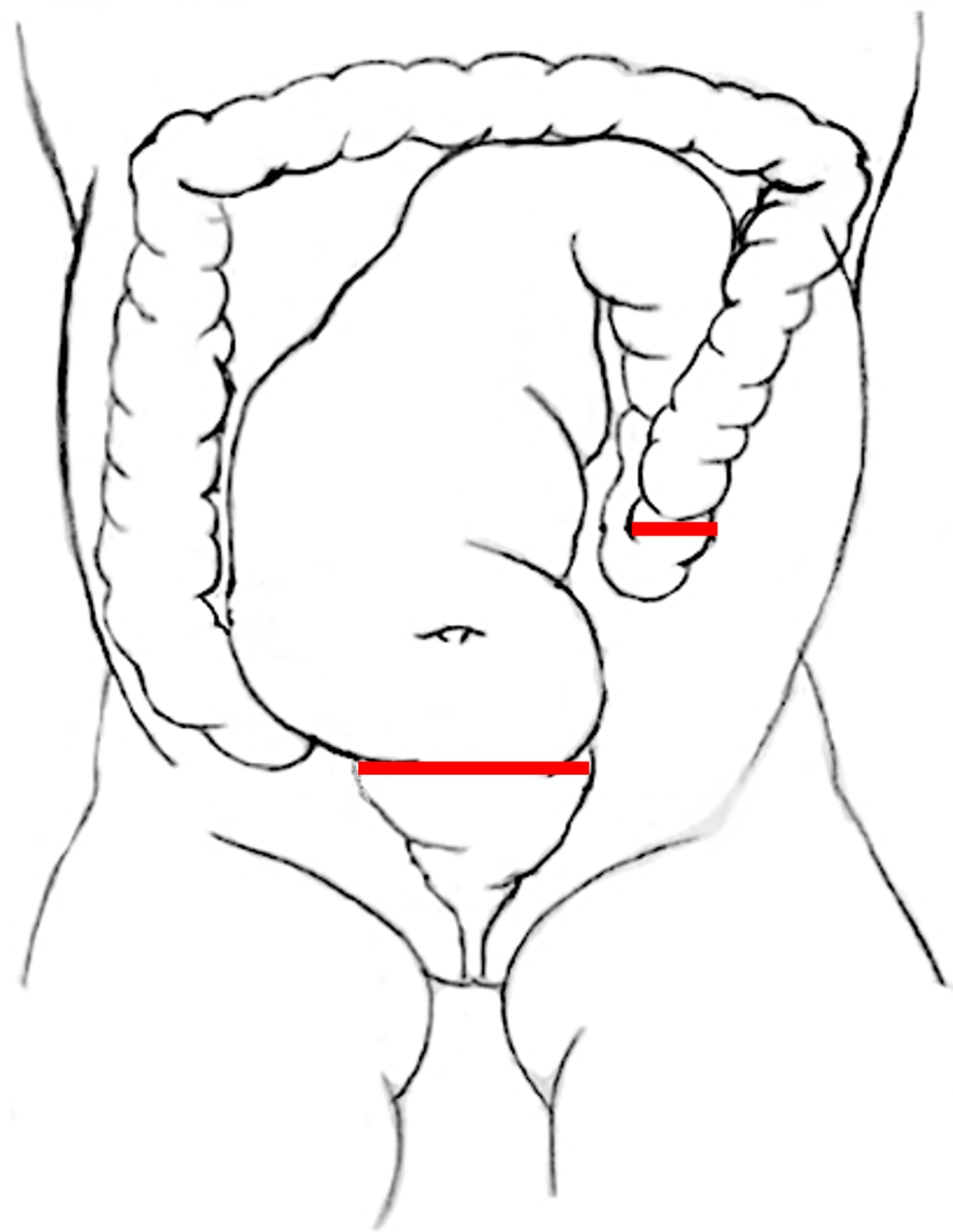
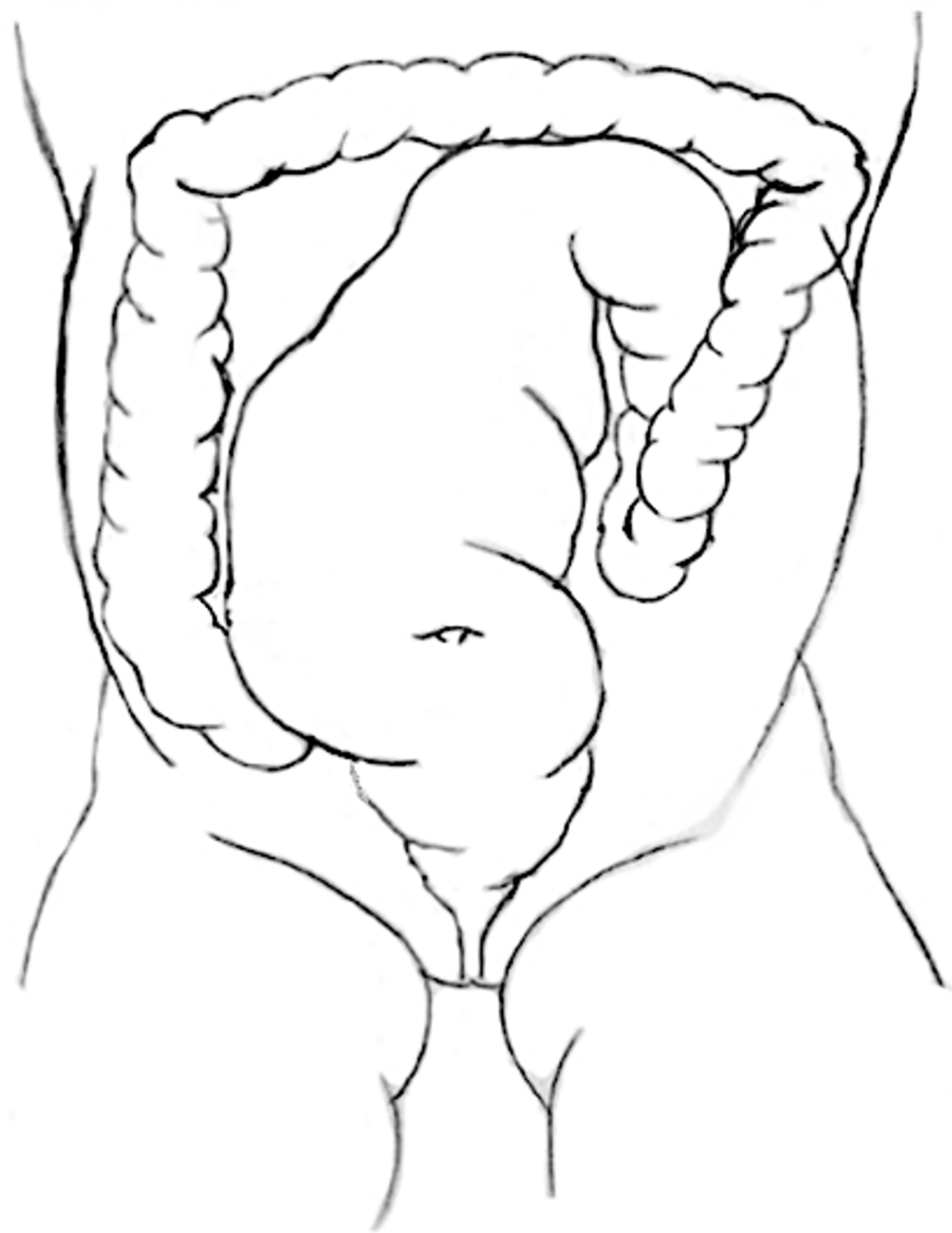
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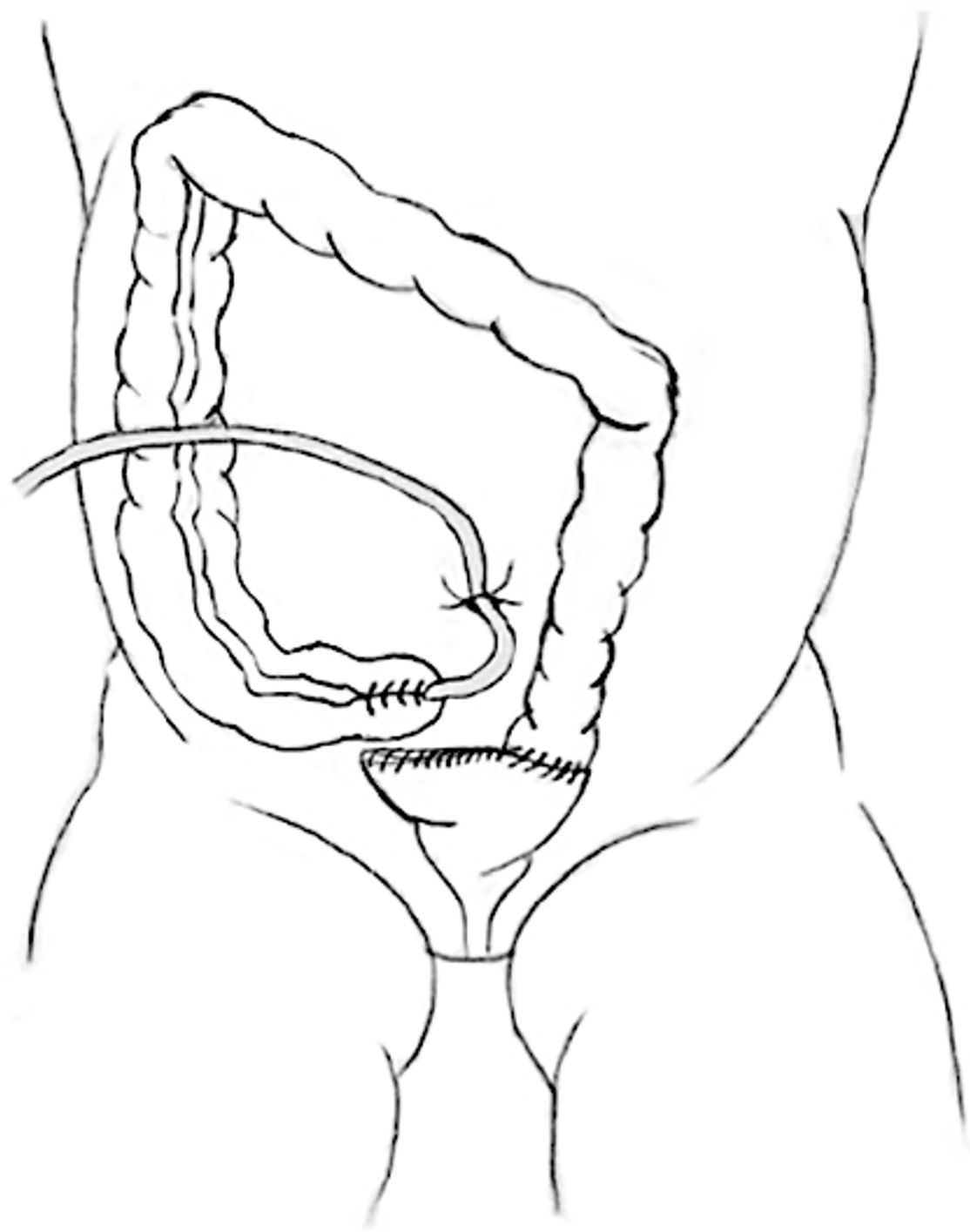
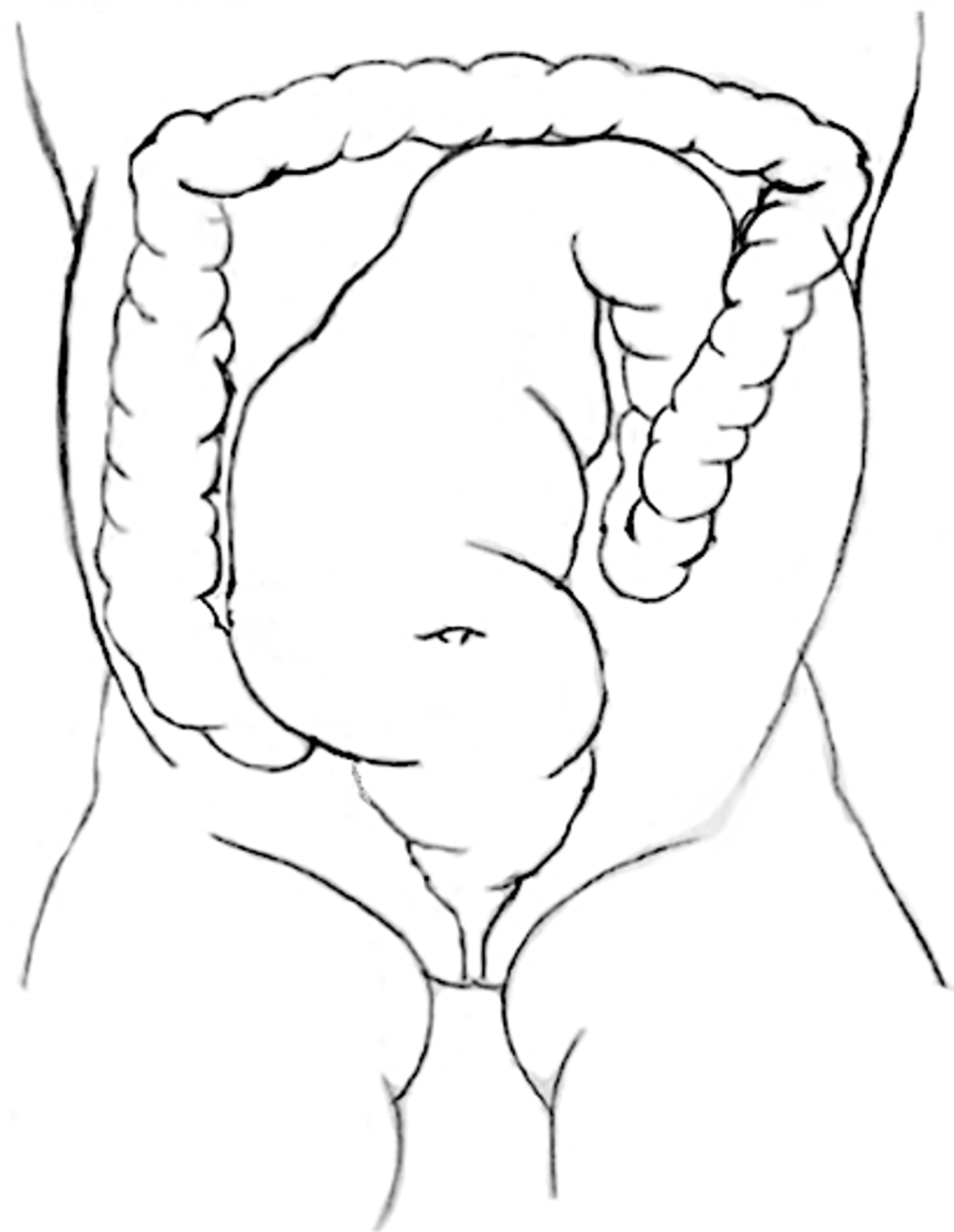


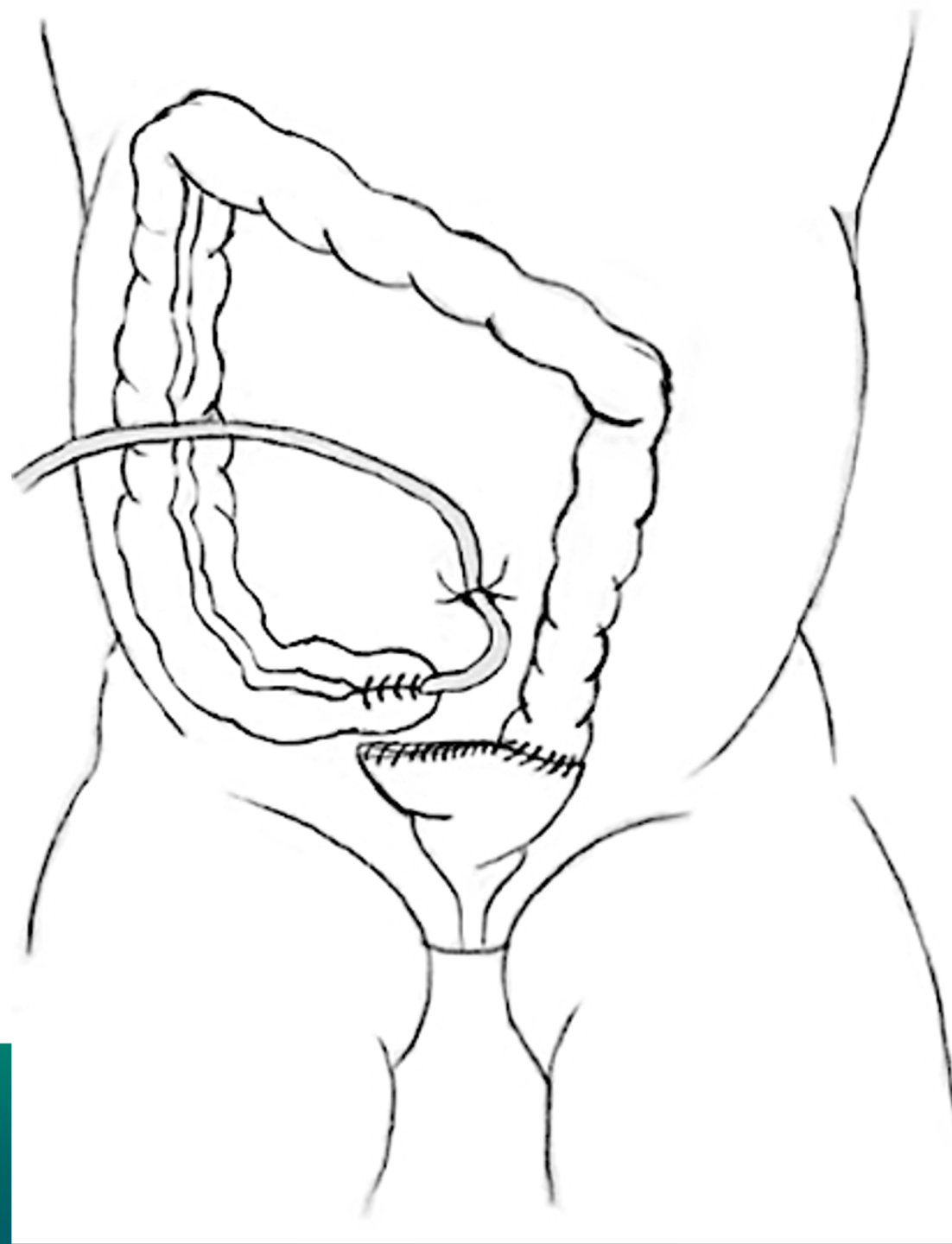
Sigmoidectomy

+

ACE

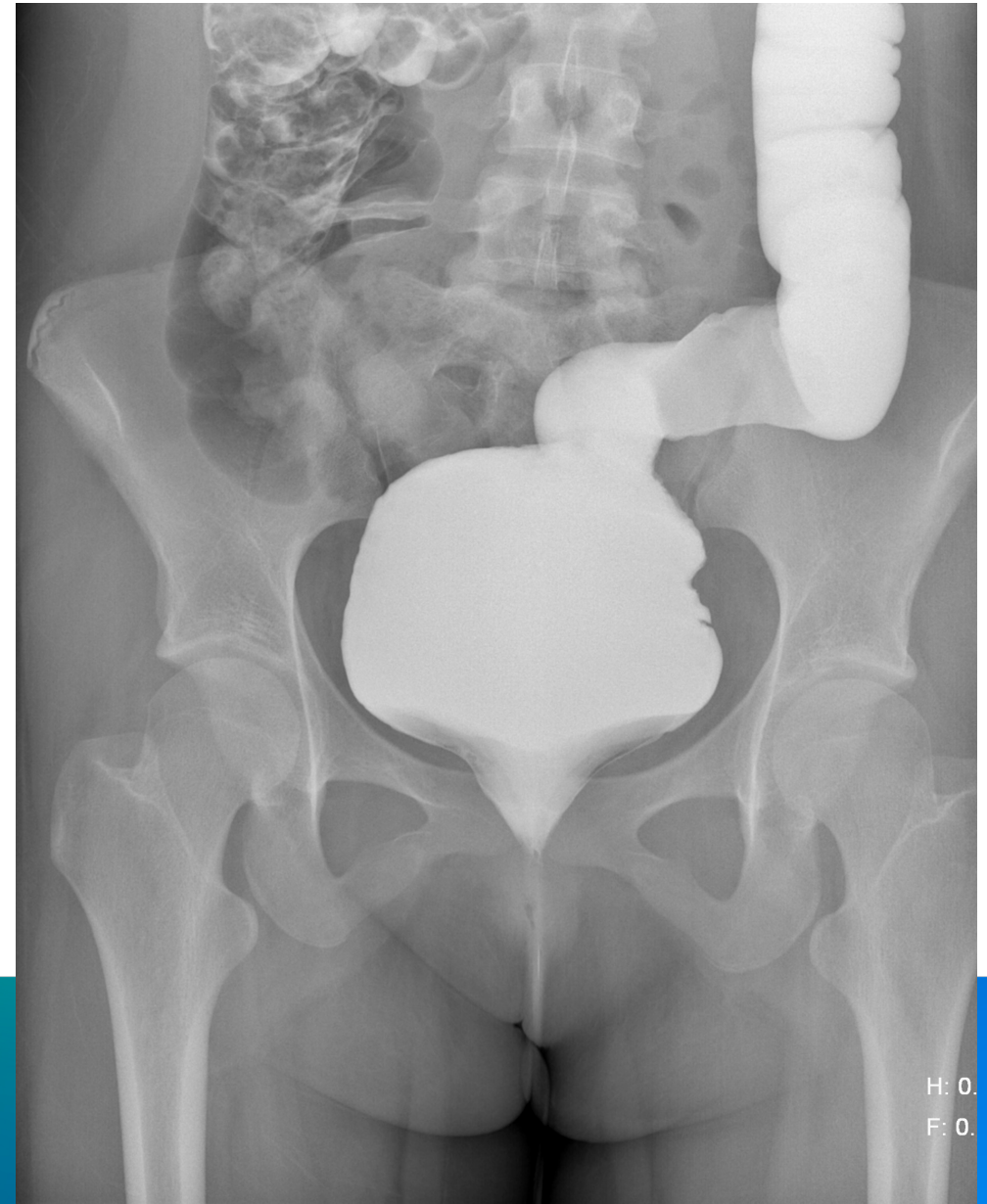




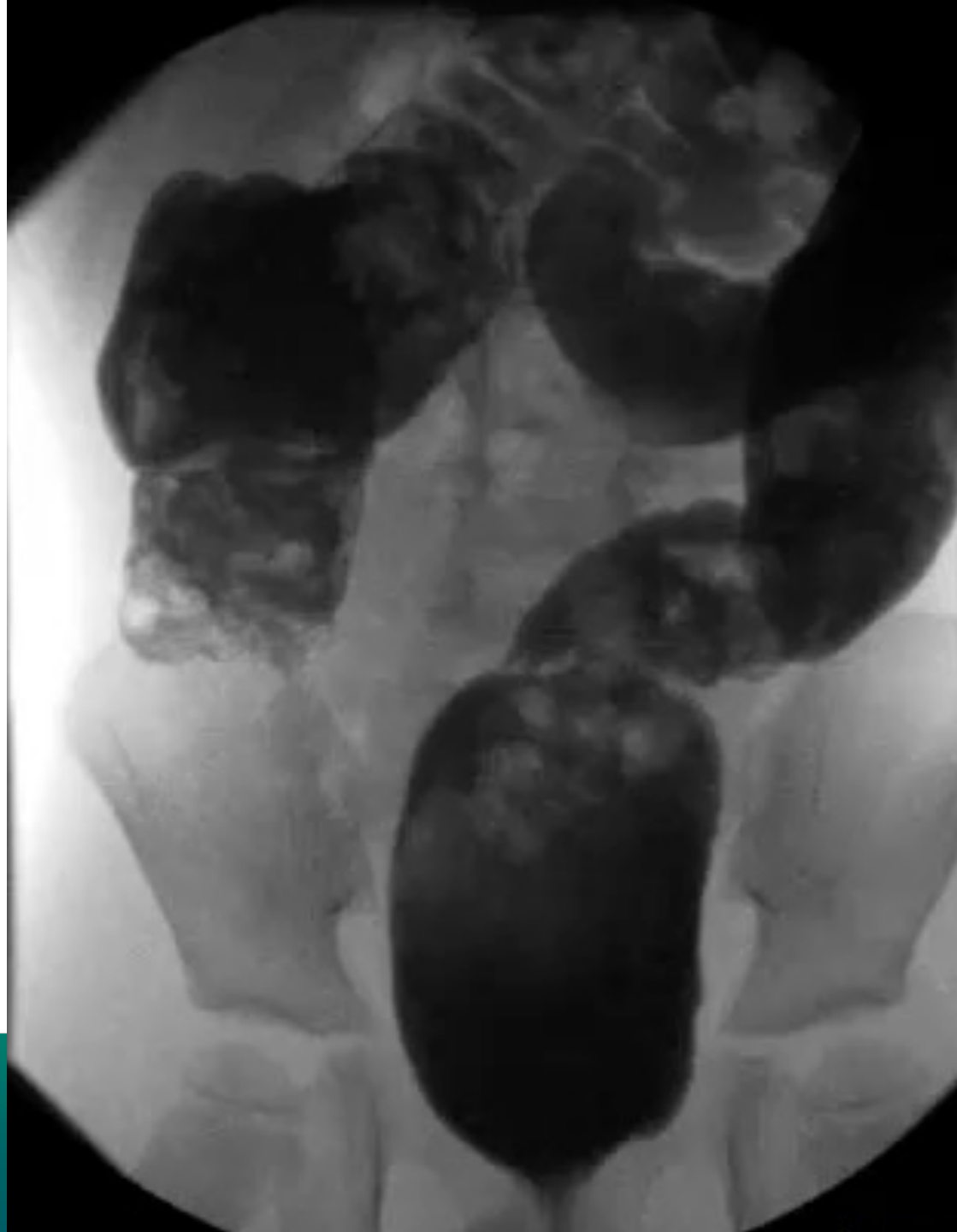


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Megarectosigmoid, now only megarectum



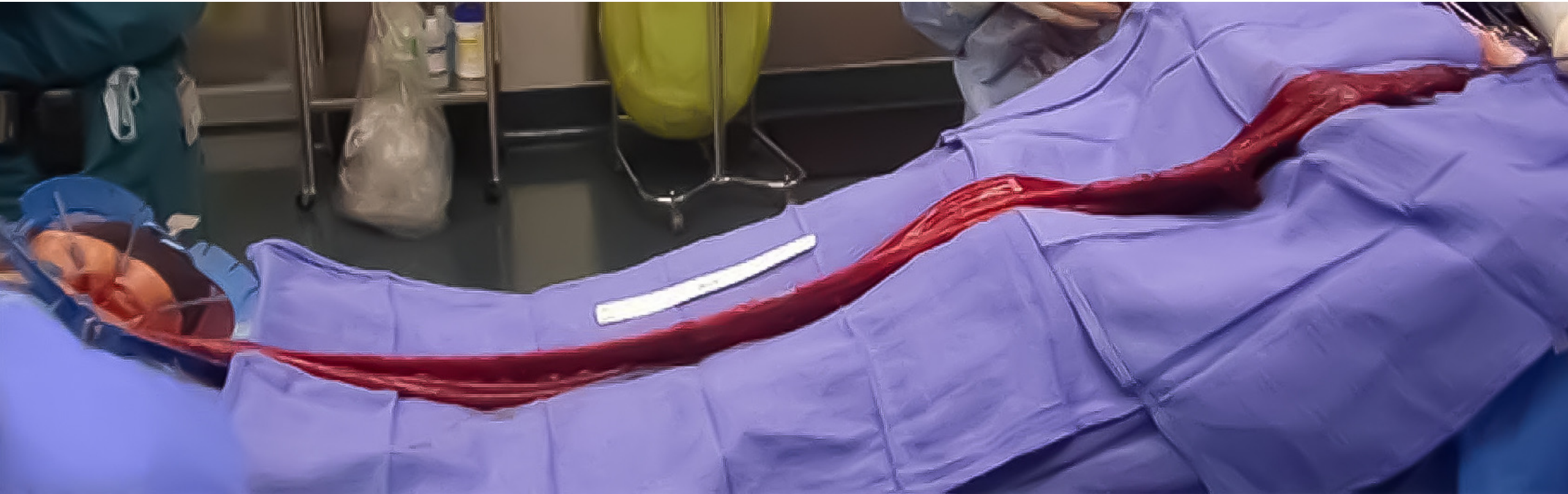
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Transanal Proctosigmoidectomy

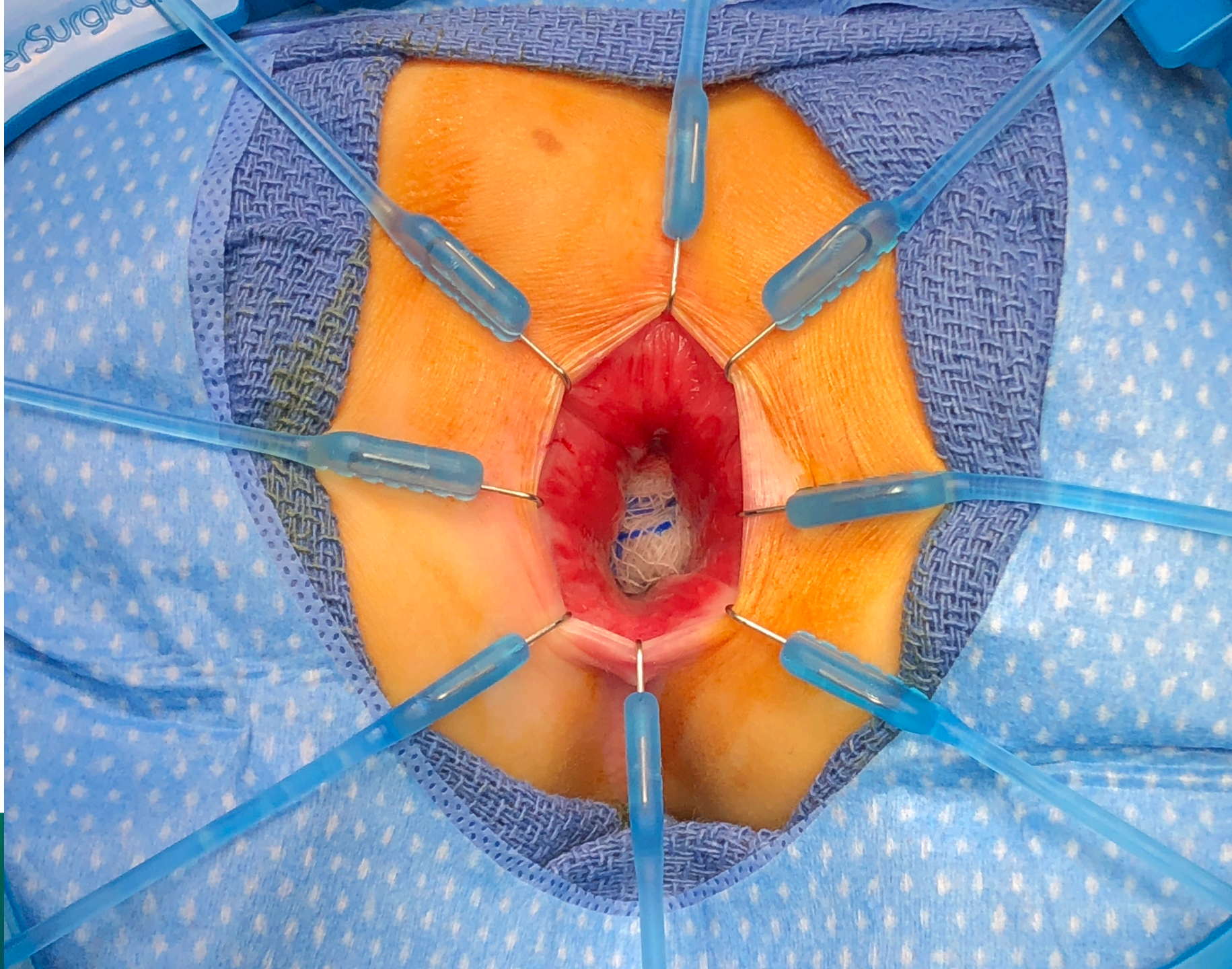


Levitt MA, Colin AM, Falcone RF, Peña A. Transanal rectosigmoid resection for severe intractable idiopathic constipation. *J Pediatr Surg* (2009) 44, 1285–1291

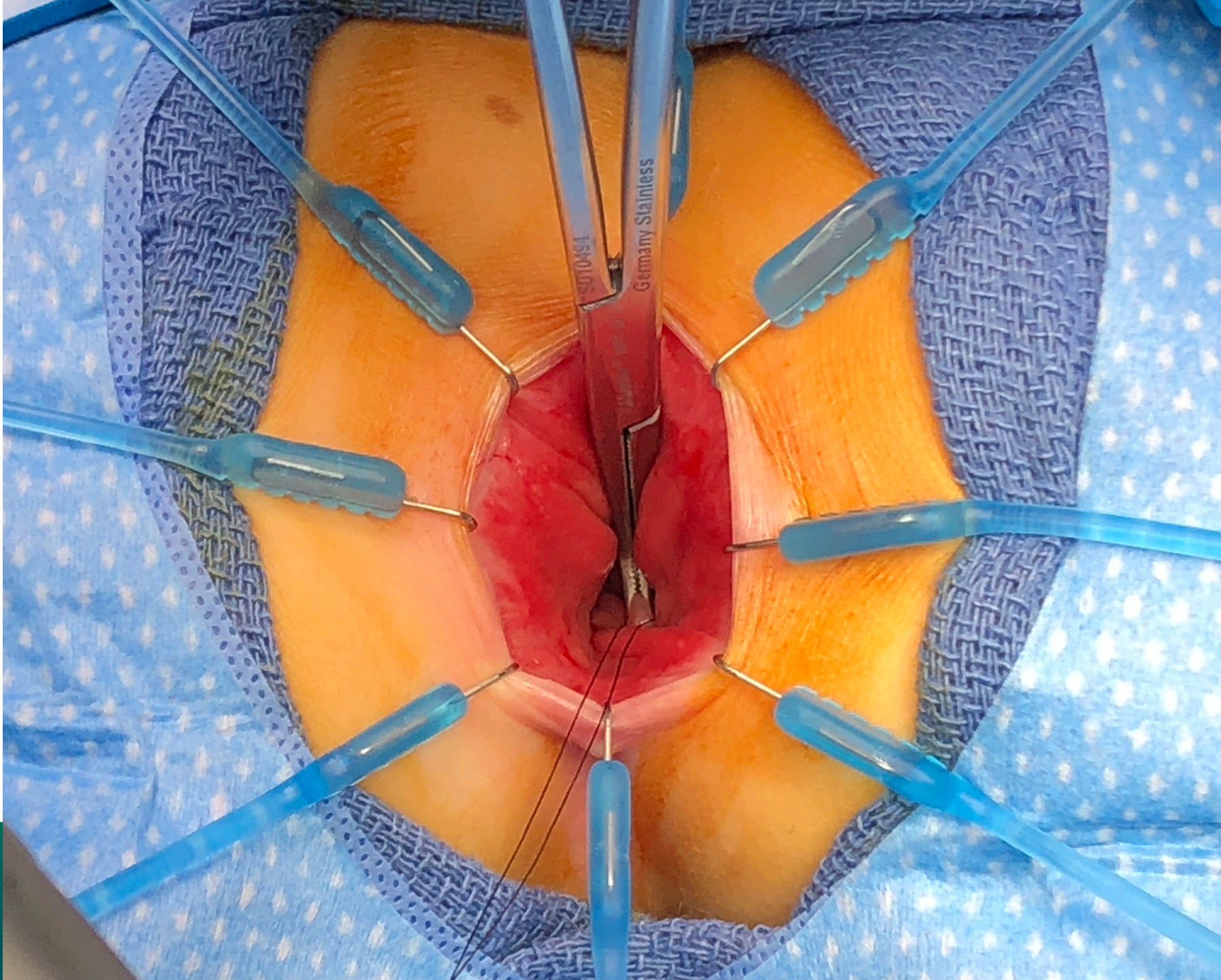
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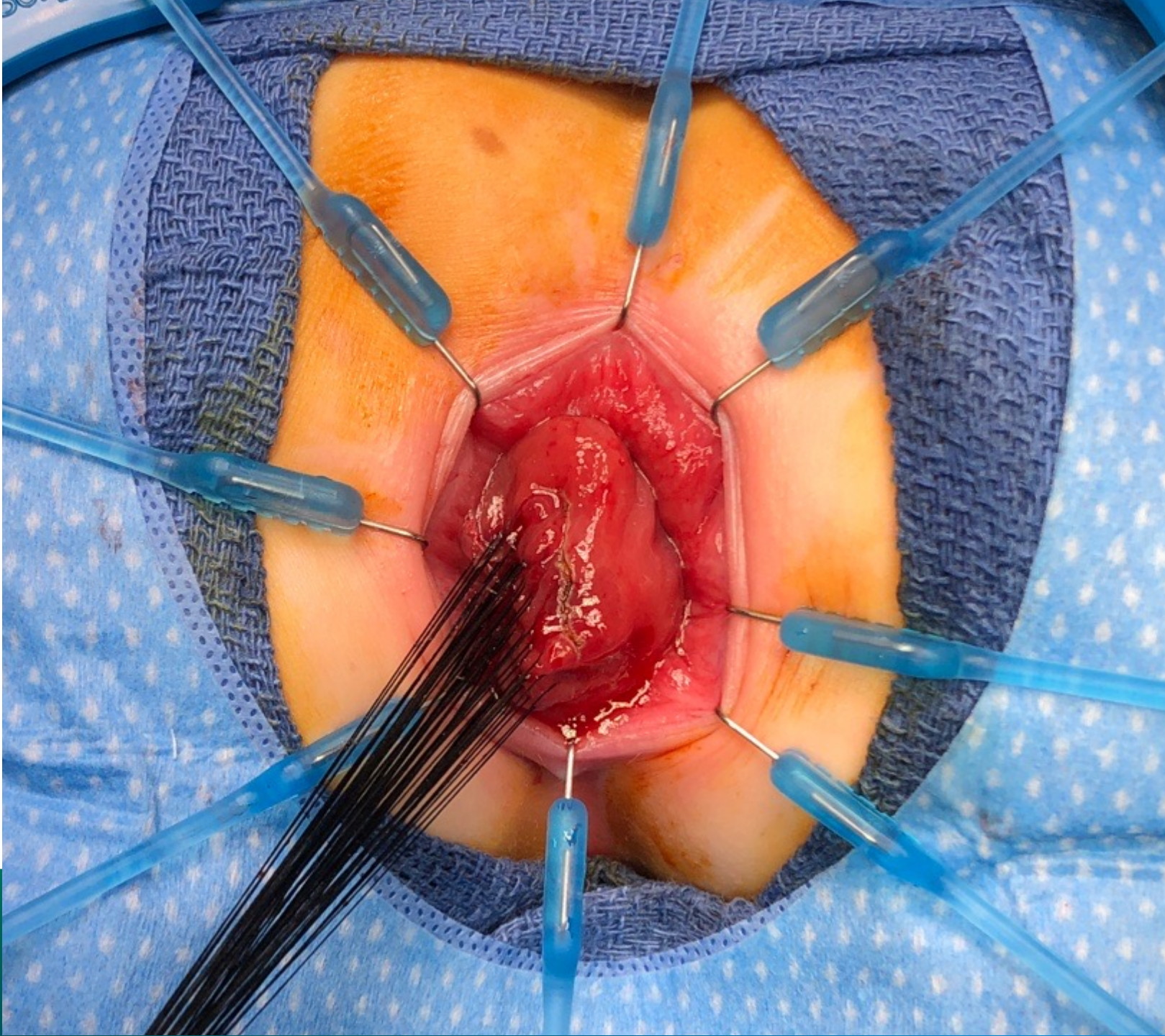
Transanal Proximal Proctosigmoidectomy



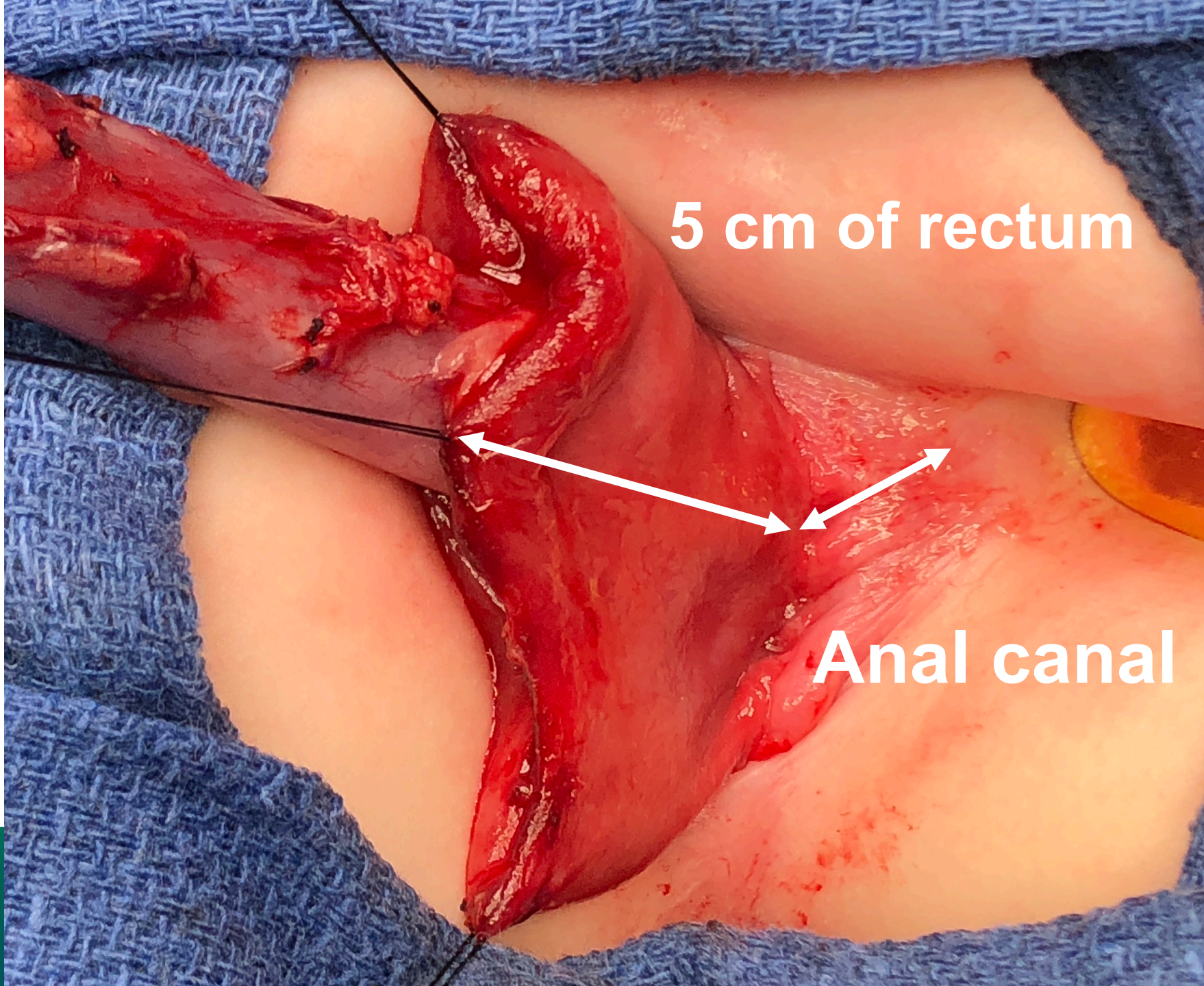
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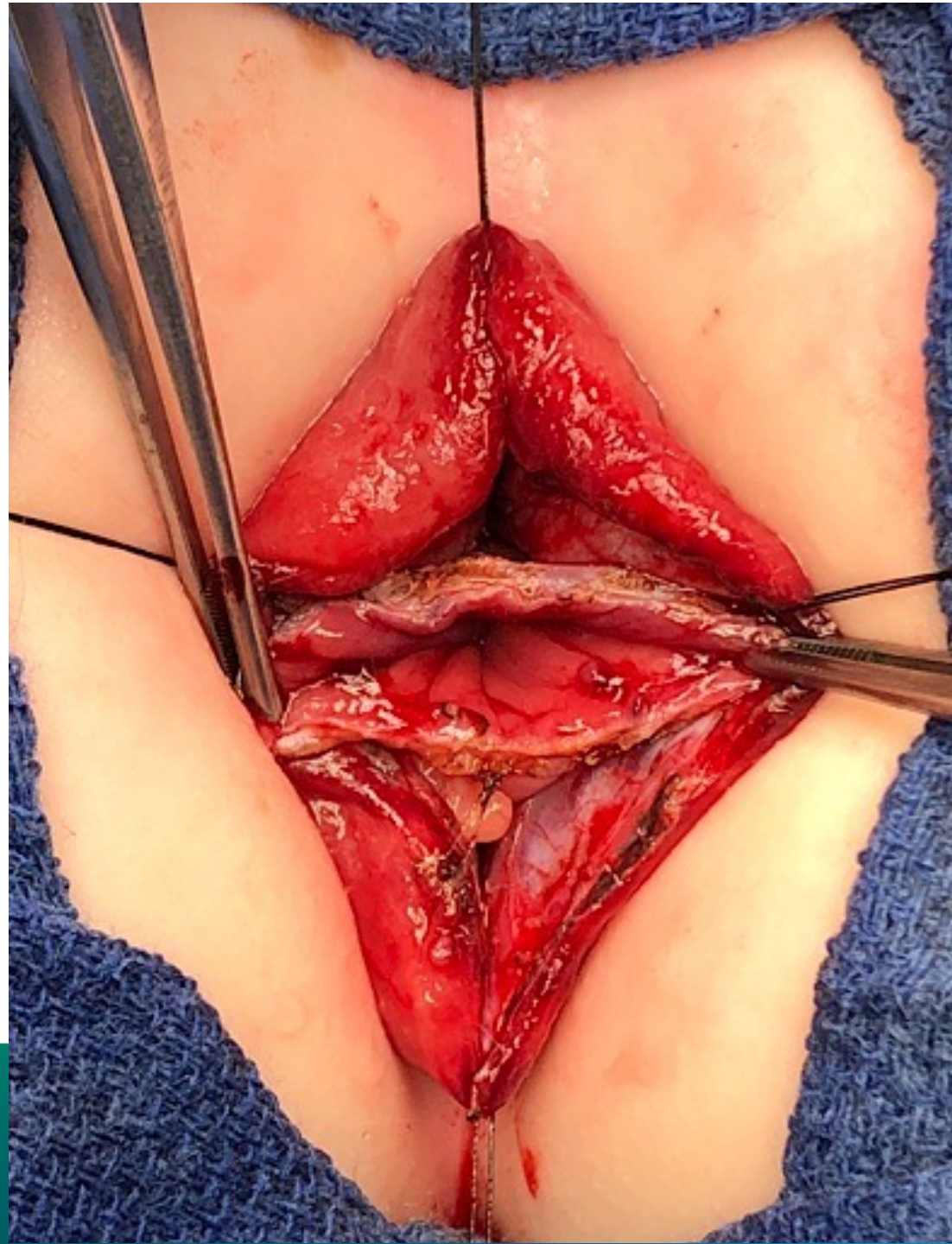






5 cm of rectum

Anal canal



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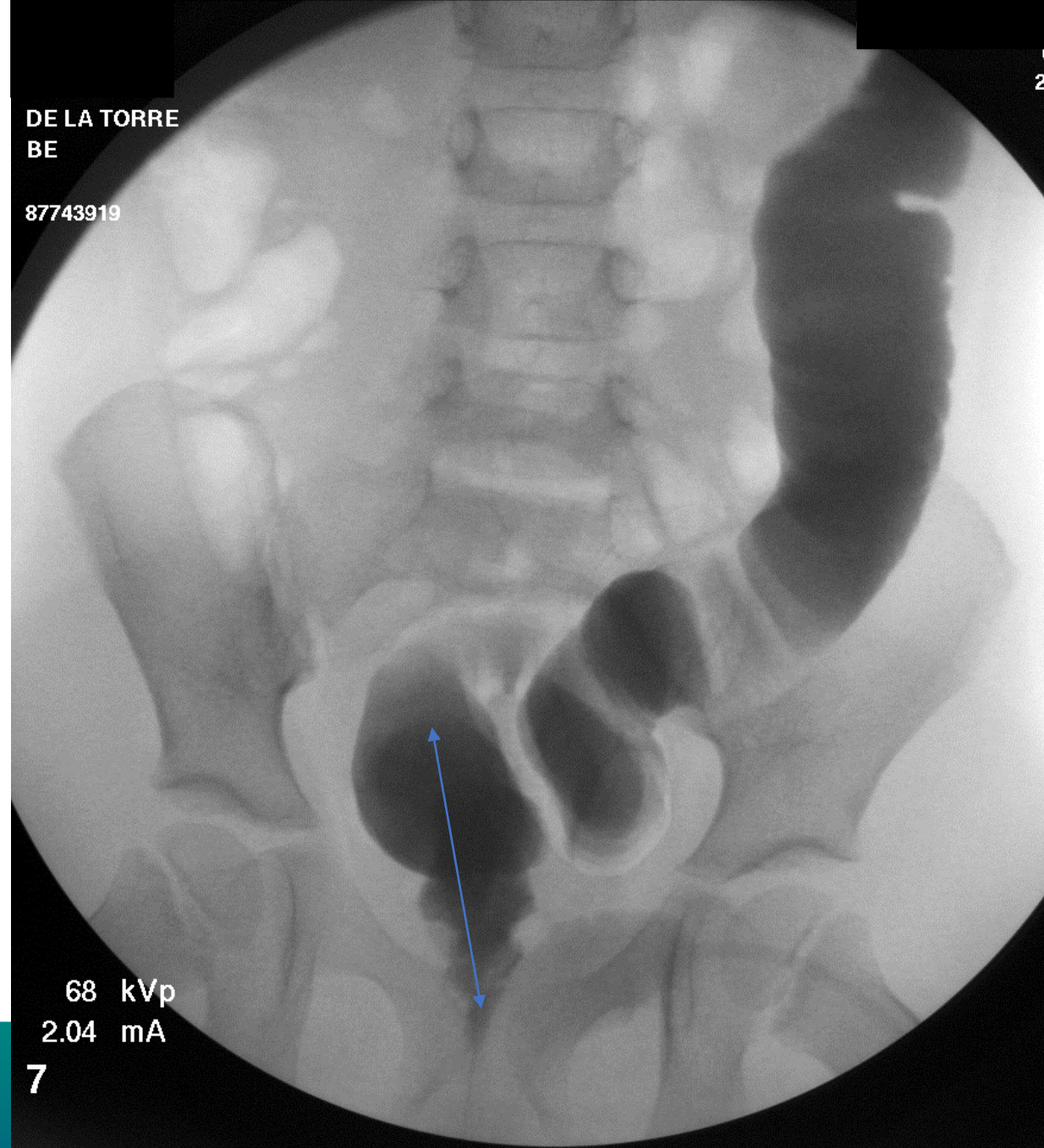




Pre-operative

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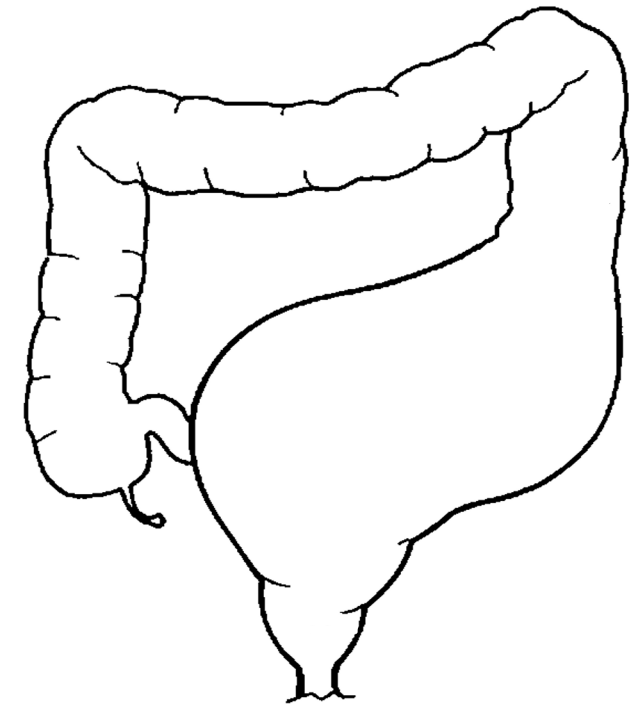


68 kVp
2.04 mA

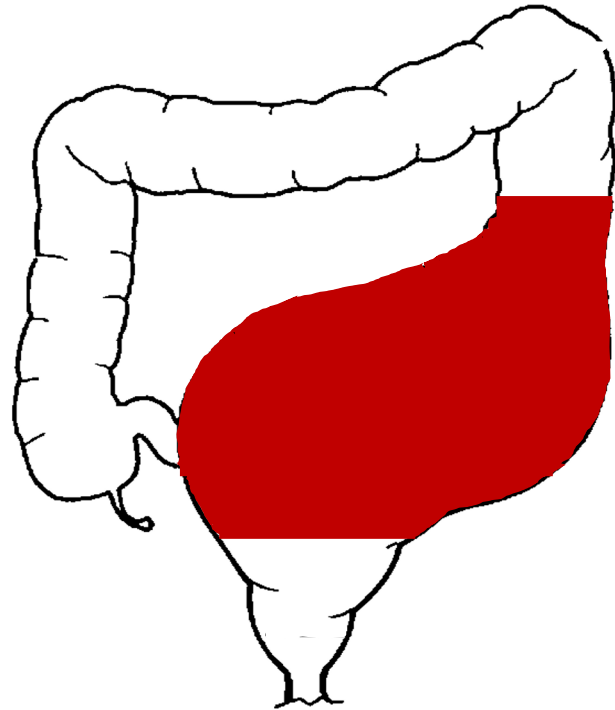
7

Post-operative

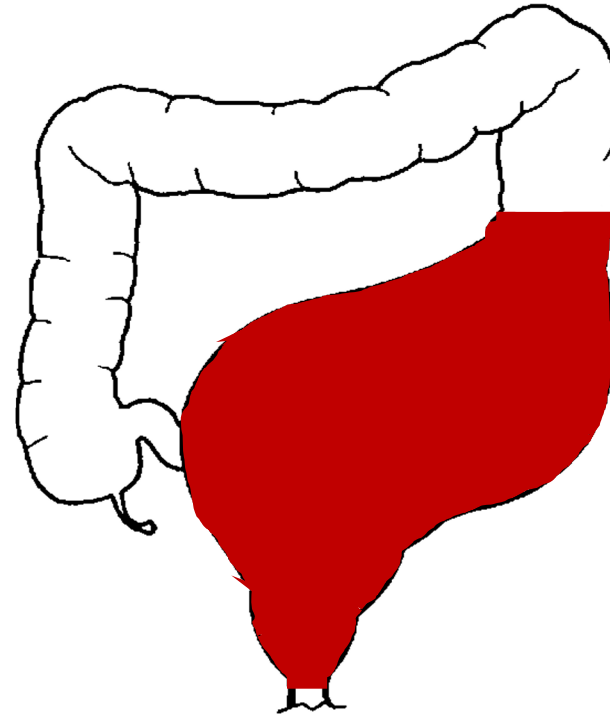




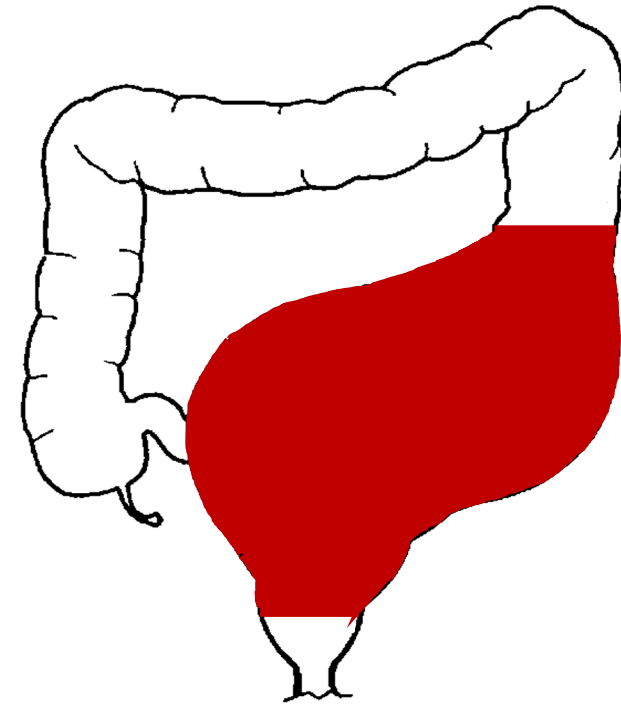
Megarectosigmoid



Sigmoidectomy

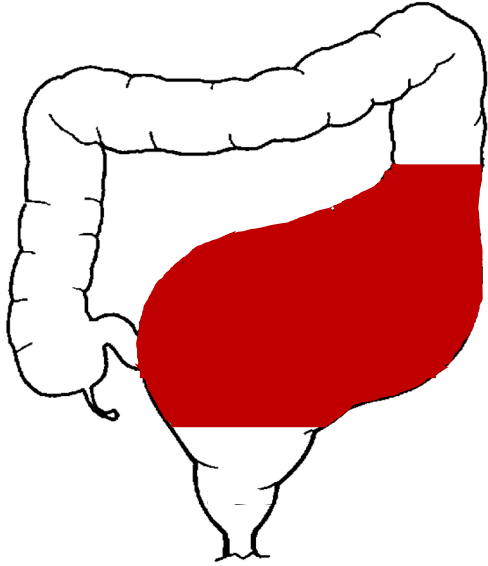


Transanal
rectosigmoidectomy

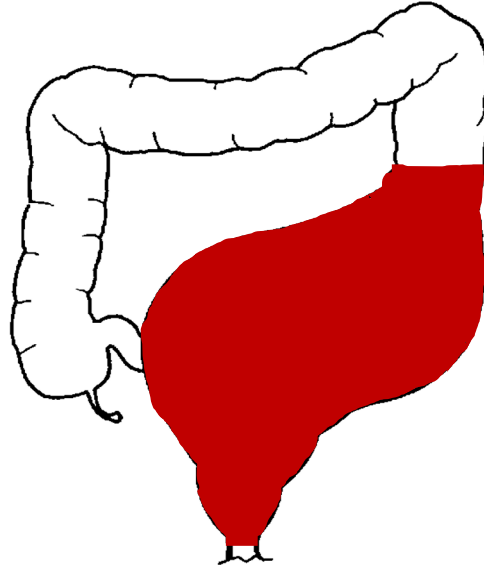


Transanal proximal
rectosigmoidectomy

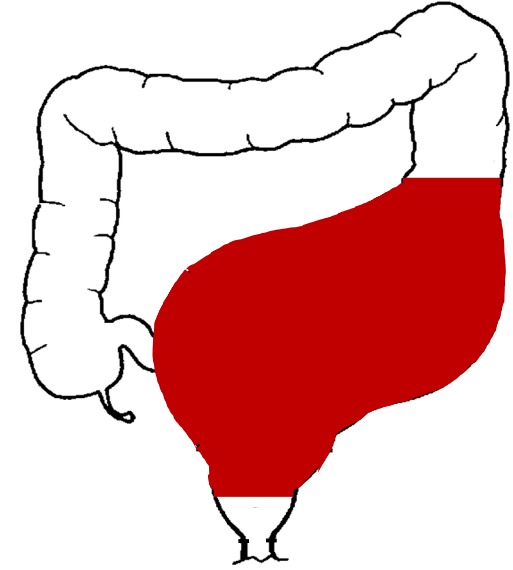
Sigmoidectomy



Transanal proctosigmoidectomy



Transanal proximal proctosigmoidectomy



Proximal limit

Peritoneal reflection

2 cm above pectinate area

Leave 5 cm of rectal reservoir

Cons

Left the complete rectum
It is a sick natural reservoir

Lack of reservoir (rectum)

?

Risk

Fecal impaction
Left abdominal pain
Obstructive symptoms

Fecal incontinence

?



Patient with neurological disorders

Resection

+

ACE

Patient without neurological disorders

Resection

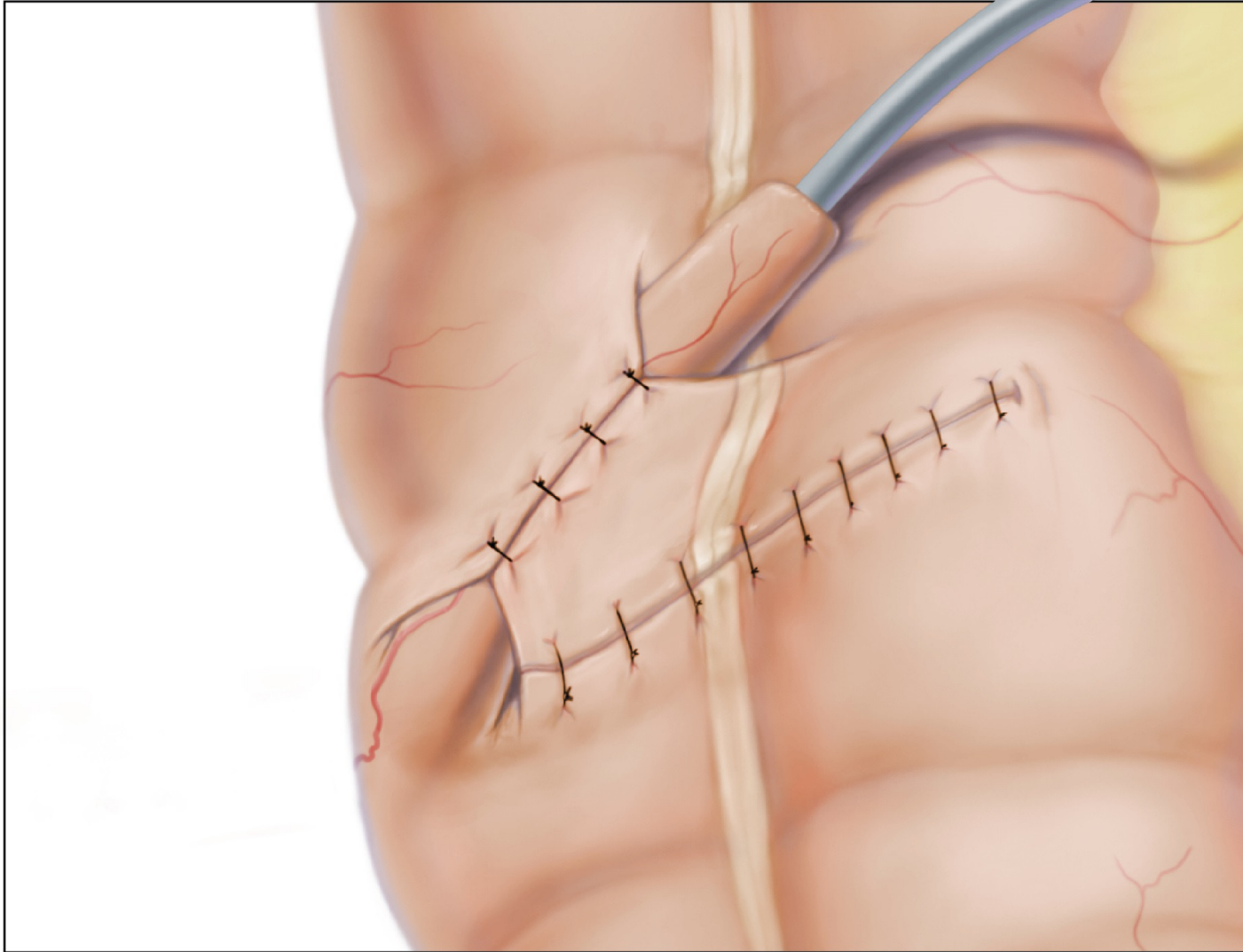
Thank you,
luis.delatorre@childrenscolorado.org



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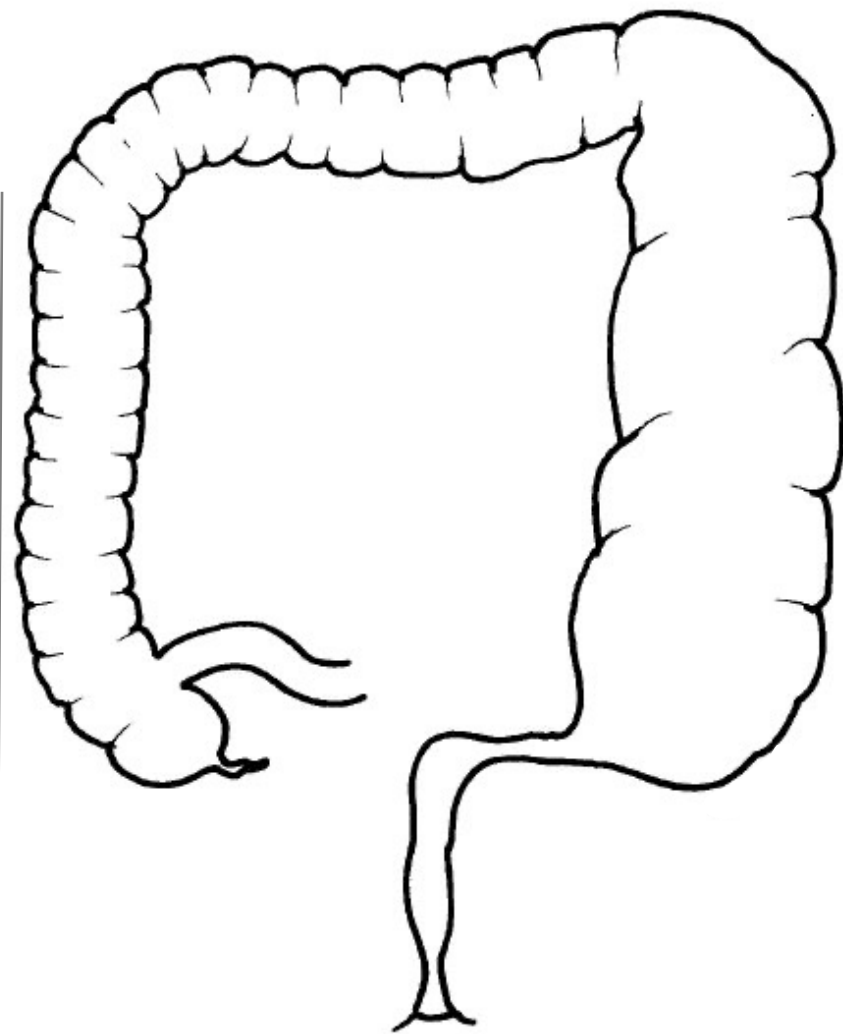
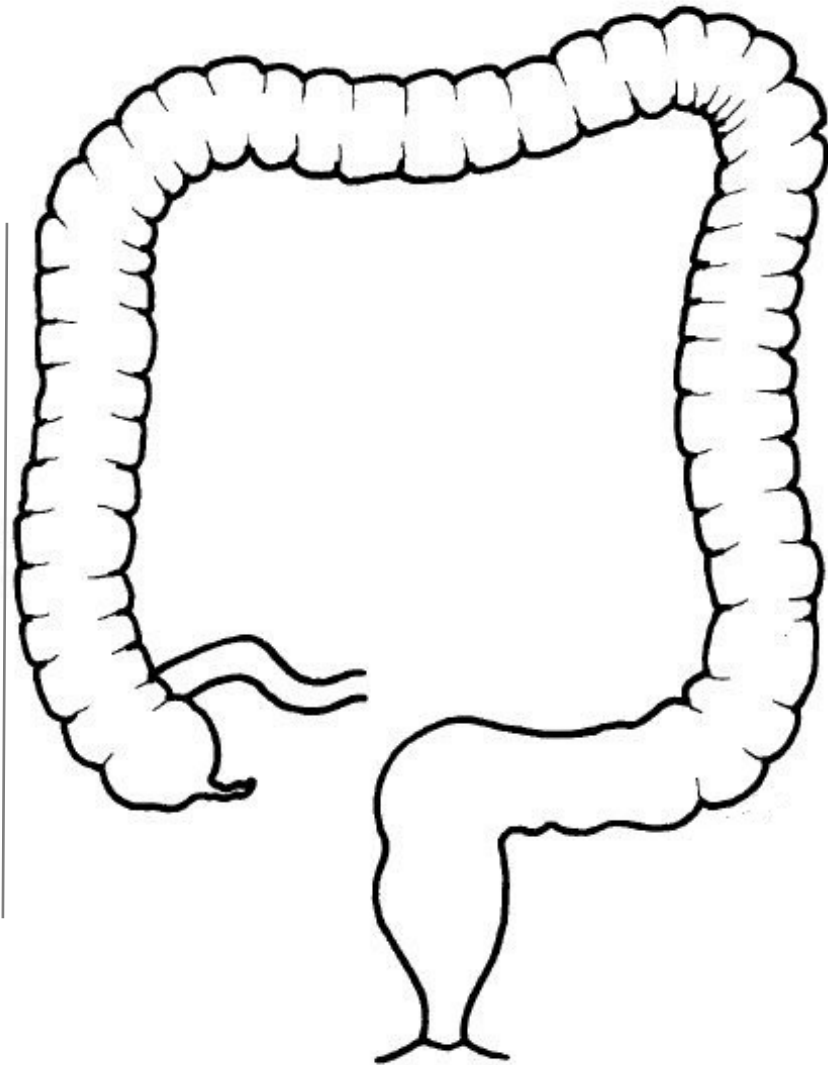
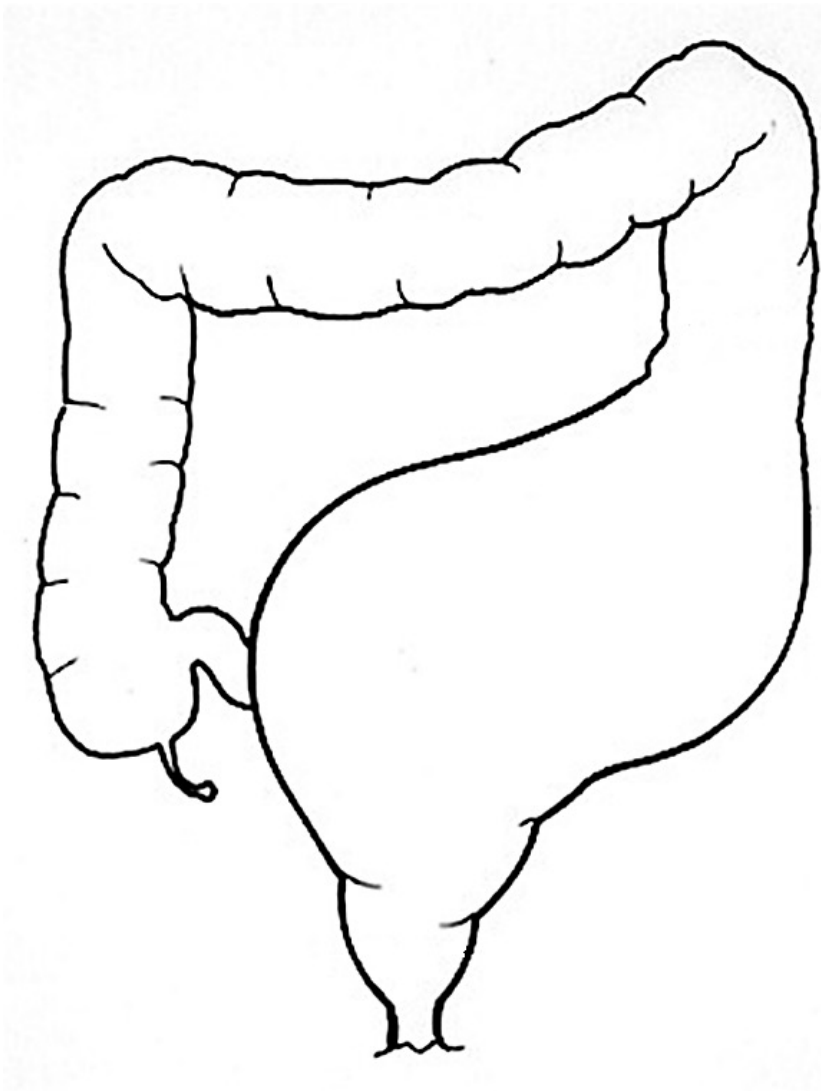
Neo-appendicostomy



“Chronic idiopathic constipation in children is a familiar and frustrating problem”



Anal procedures
<ul style="list-style-type: none">• Sphincter myectomy or myotomy• Botulinum toxin (Botox) injection
Antegrade colonic enemas
<ul style="list-style-type: none">• Appendicostomy• Cecostomy
Colorectal resection
<ul style="list-style-type: none">• Segmental resection (e.g., rectosigmoidectomy)• Subtotal colectomy• Total proctocolectomy
Intestinal diversion
<ul style="list-style-type: none">• Ileostomy• Colostomy





Abdominal x-ray

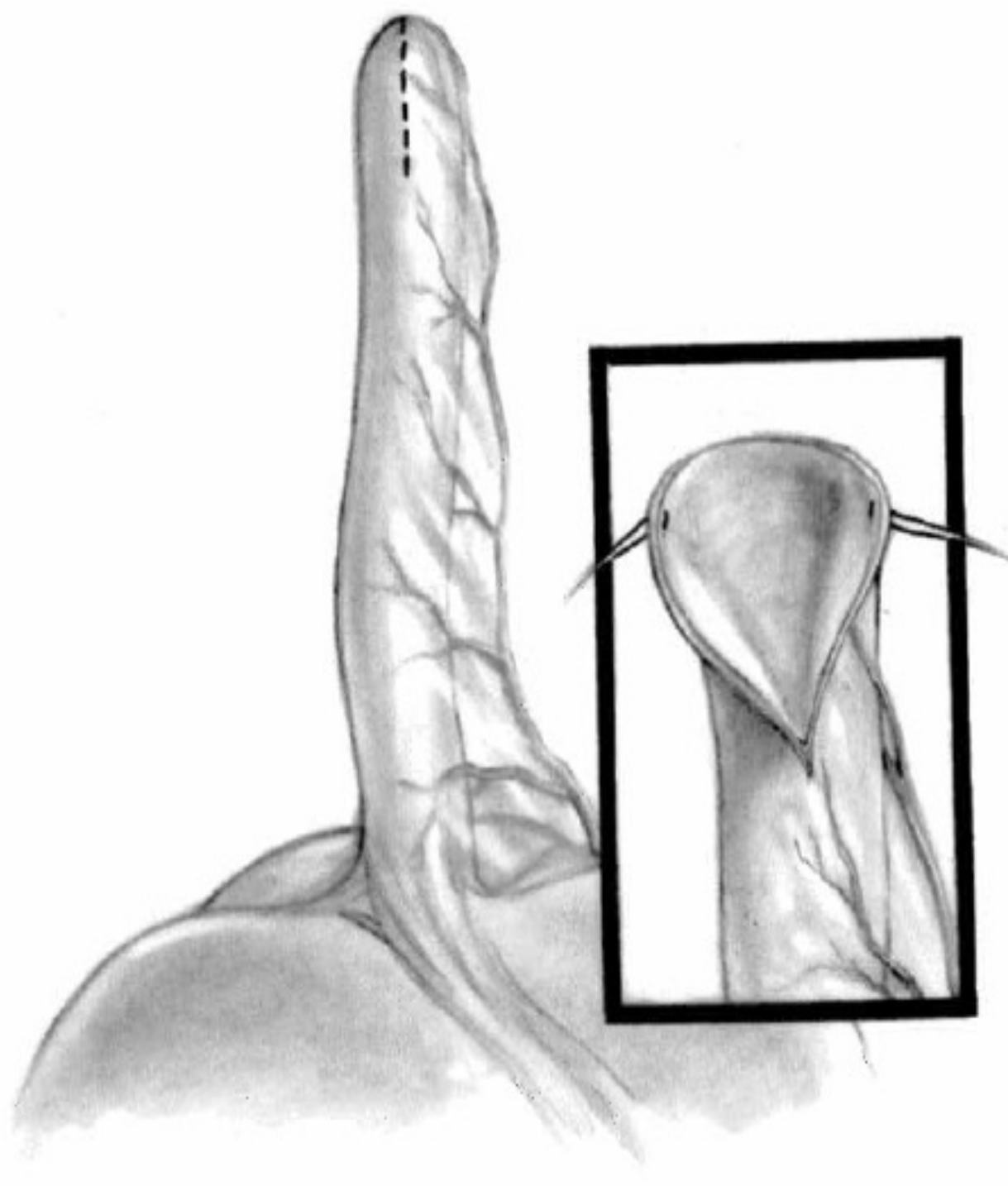
Contrast enema



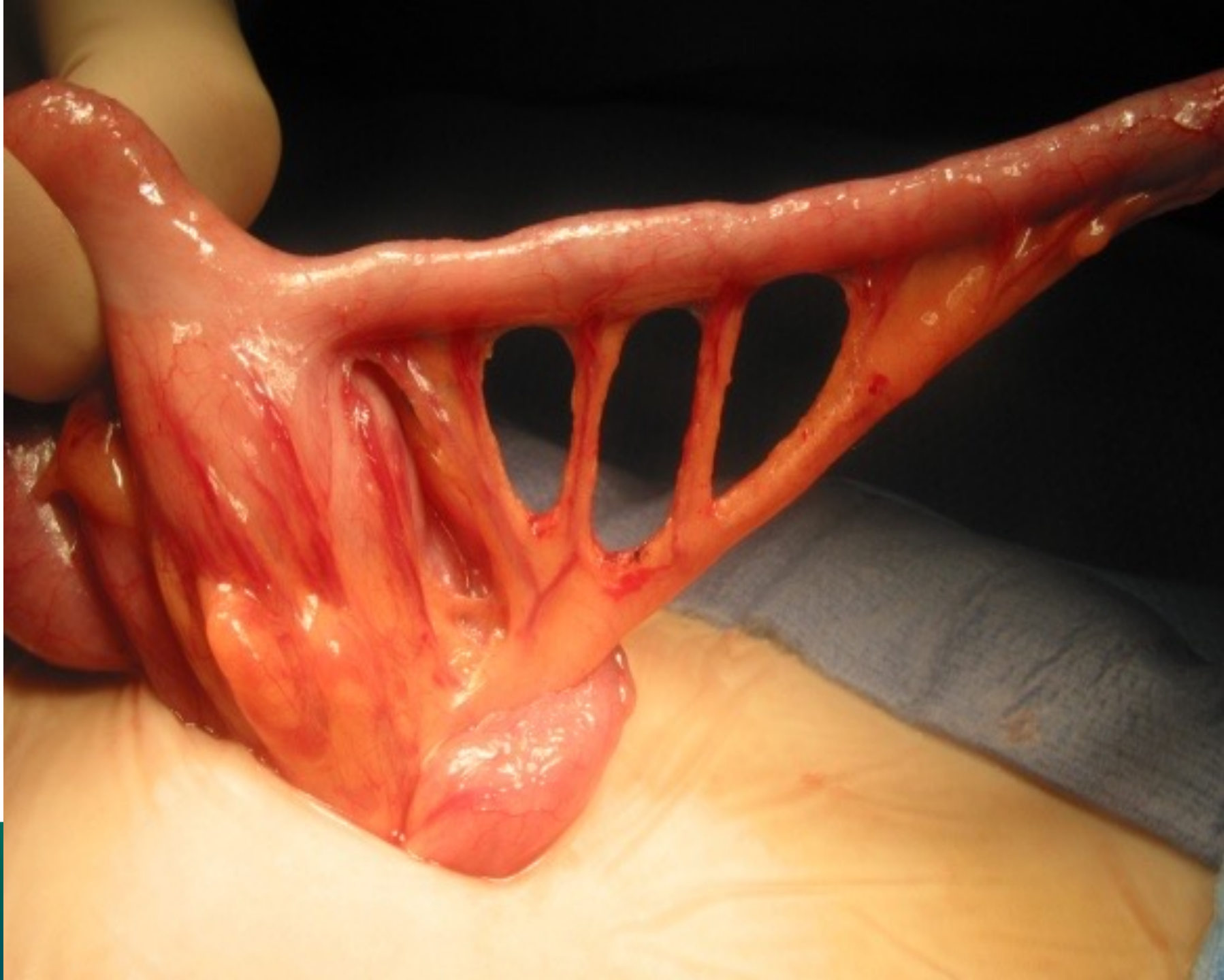
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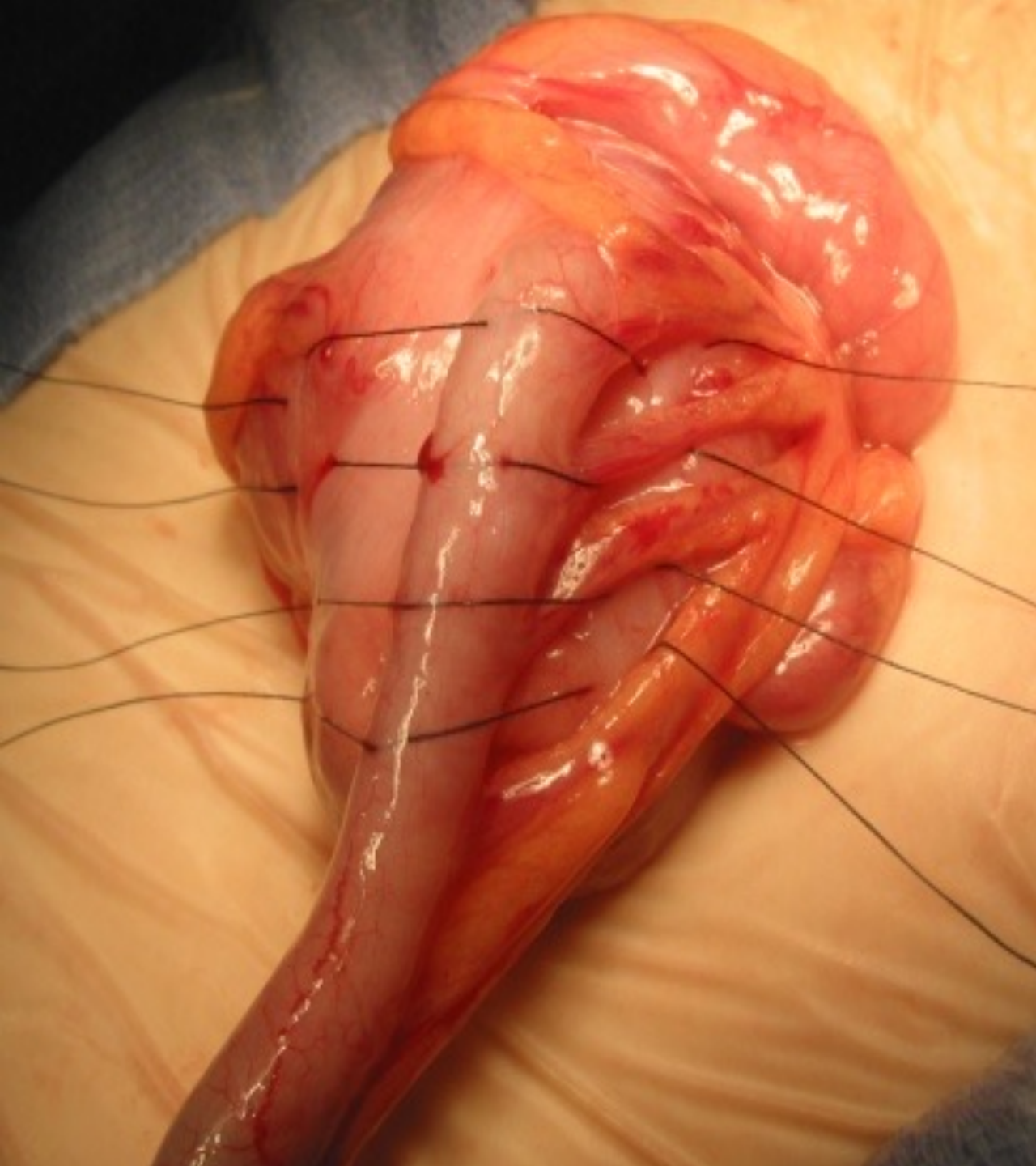


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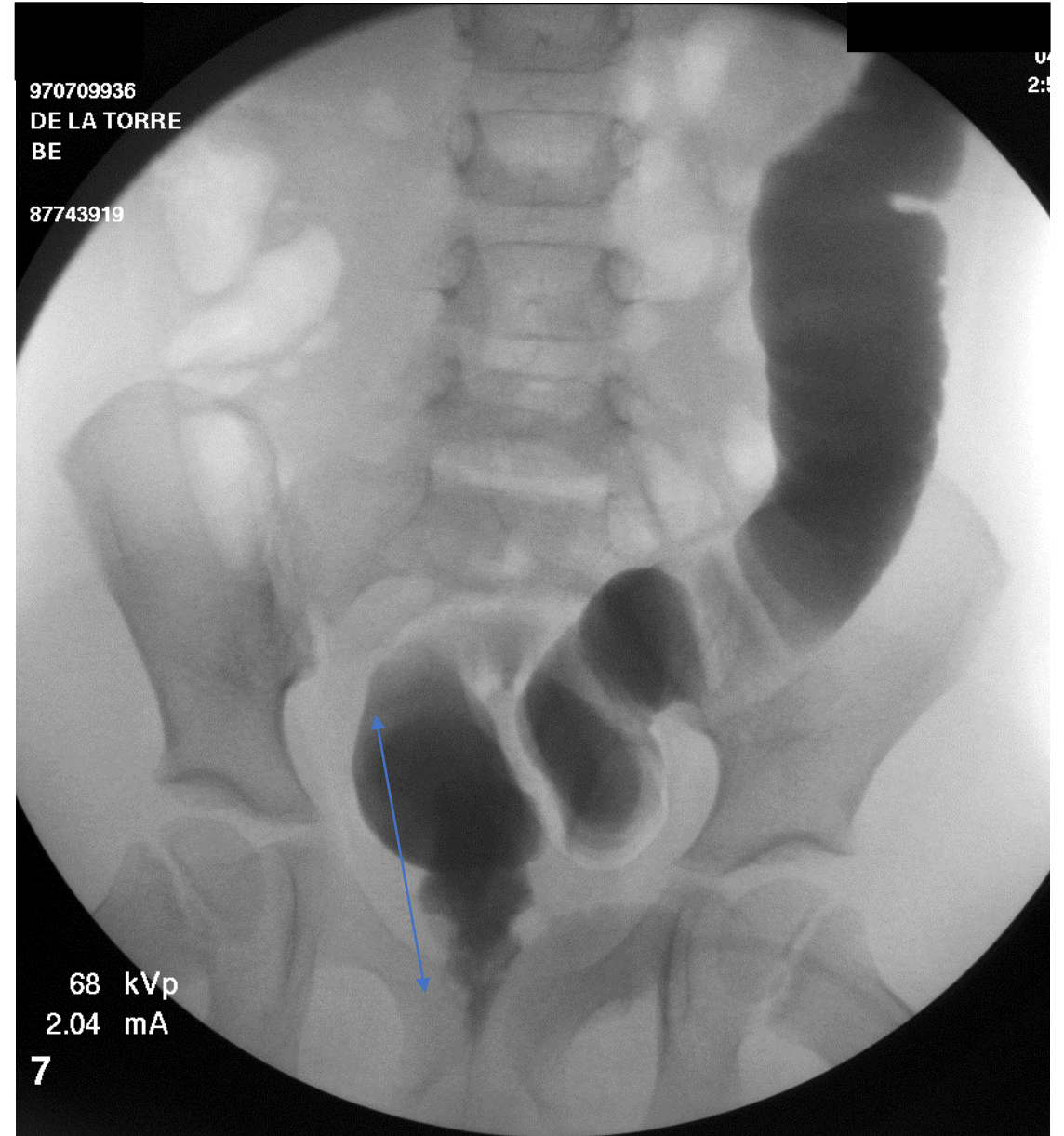
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Pre-operative



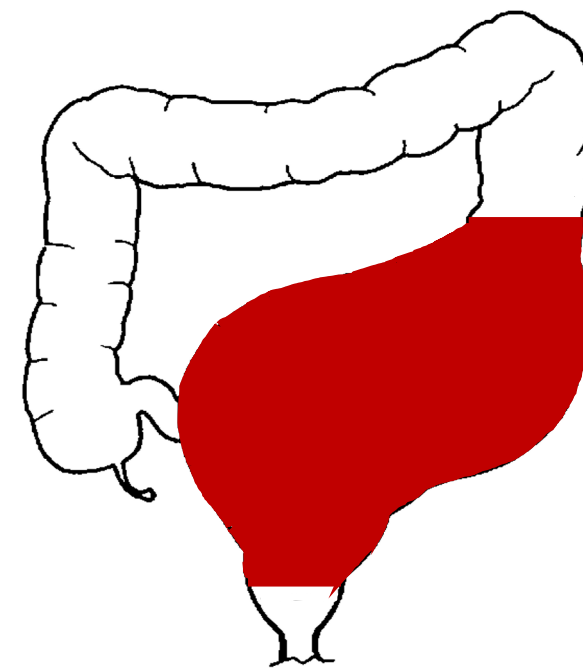
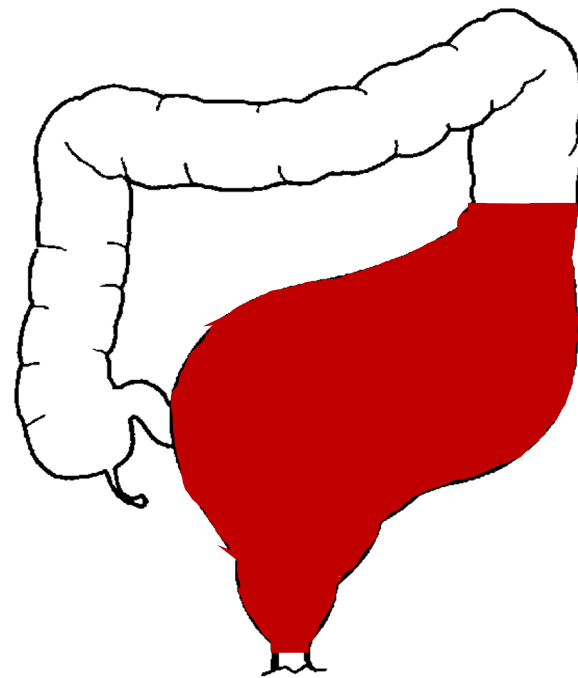
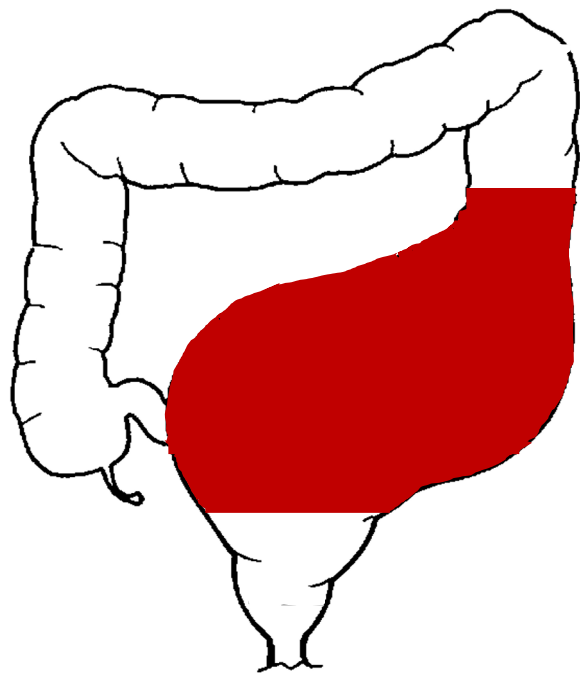
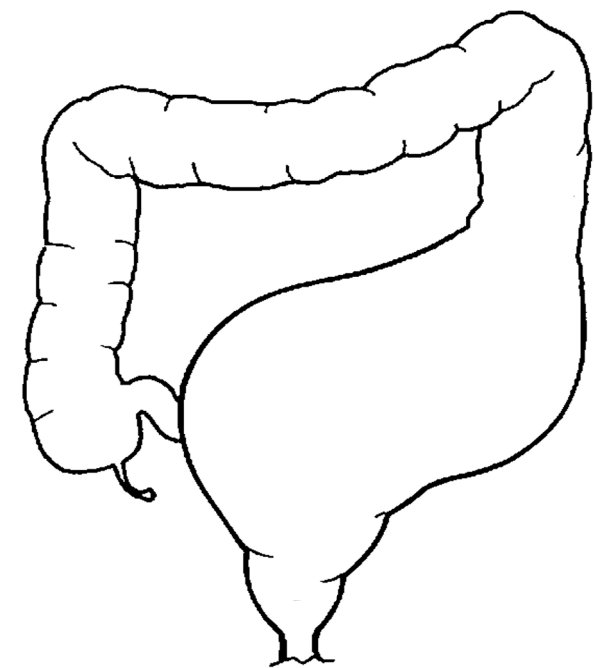
Post-operative

Megarectosigmoid

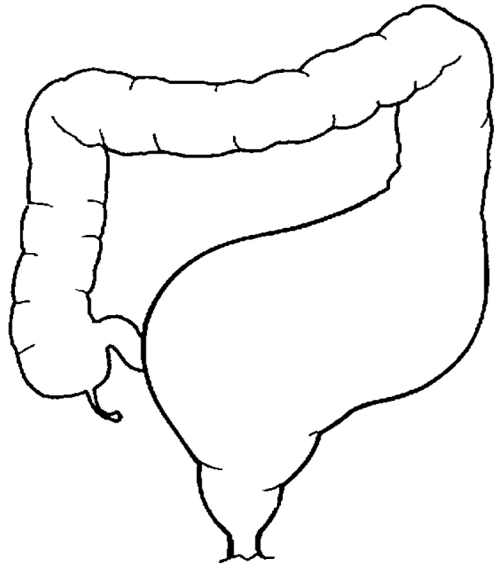
Sigmoidectomy

**Transanal
rectosigmoidectomy**

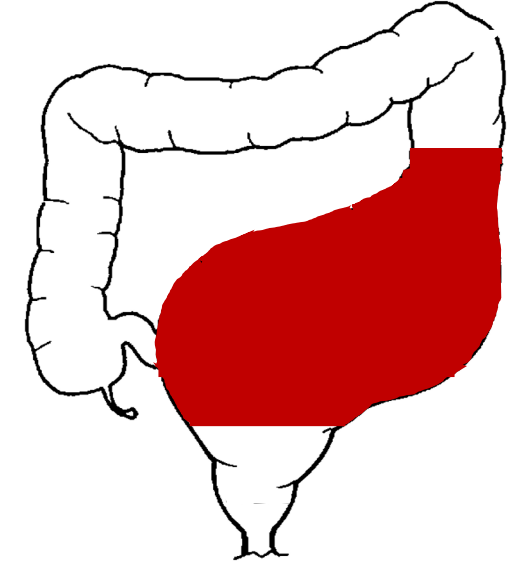
**Transanal proximal
rectosigmoidectomy**



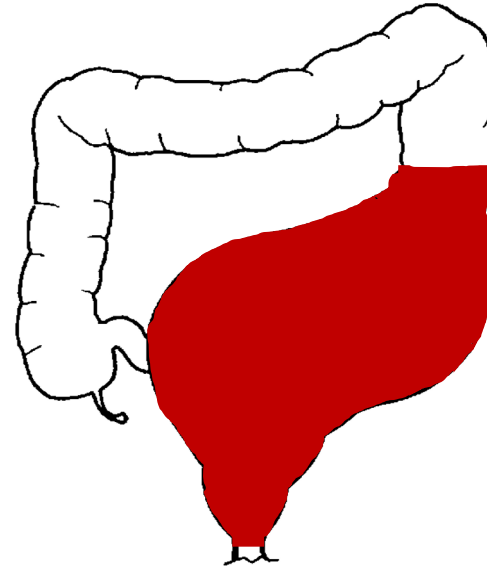
Megarectosigmoid



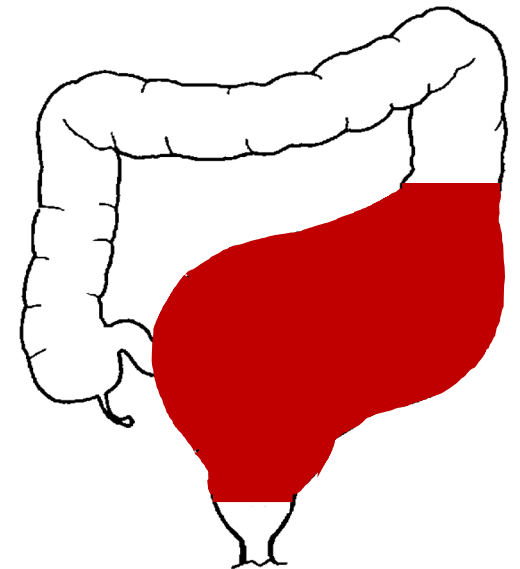
Sigmoidectomy



**Transanal
rectosigmoidectomy**



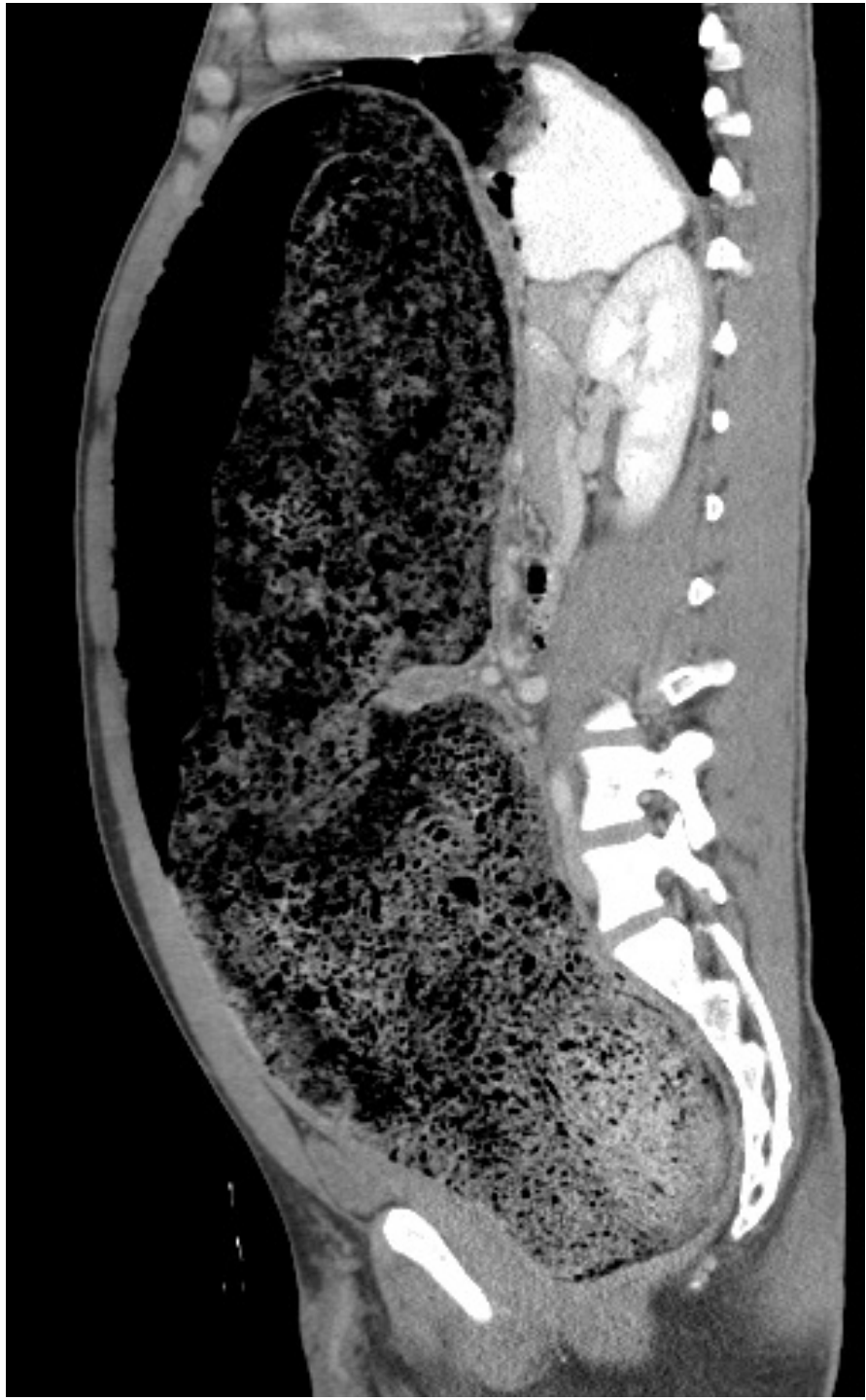
**Transanal proximal
rectosigmoidectomy**



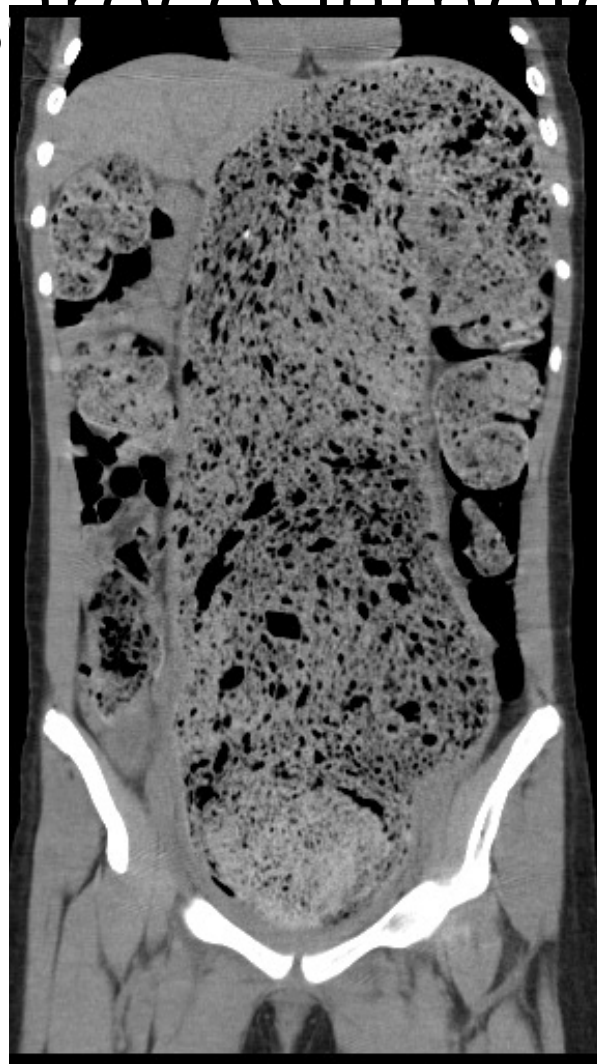








Megarrecesimoides ahora solo megarecto





Antegrade Enema procedures



Appendicostomy

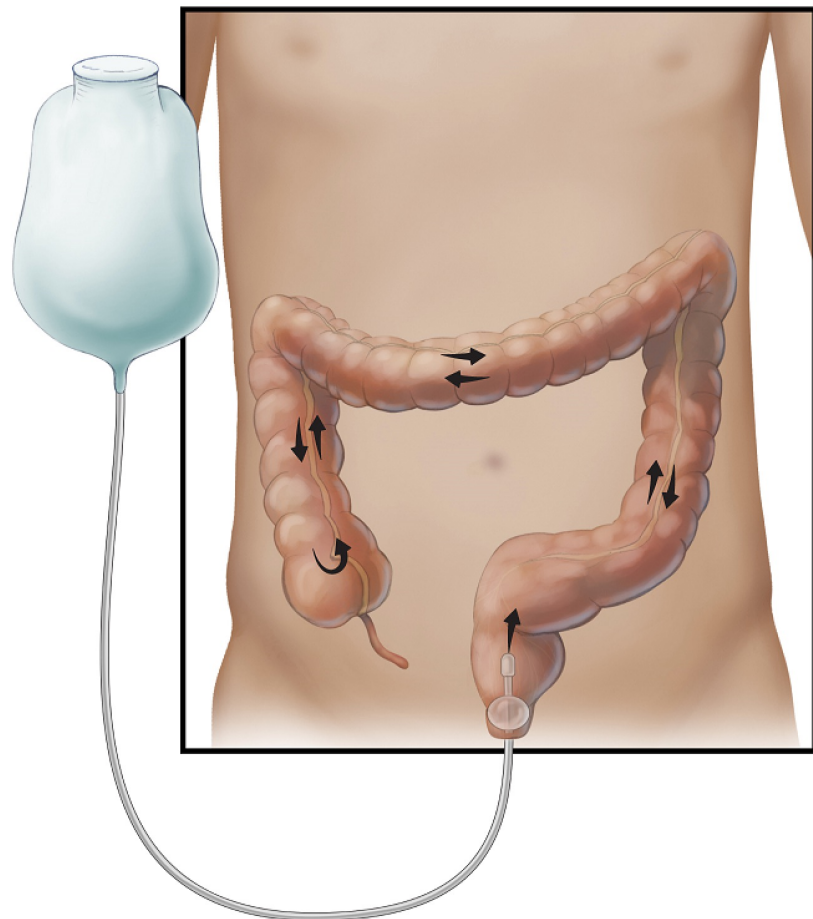
Cecostomy



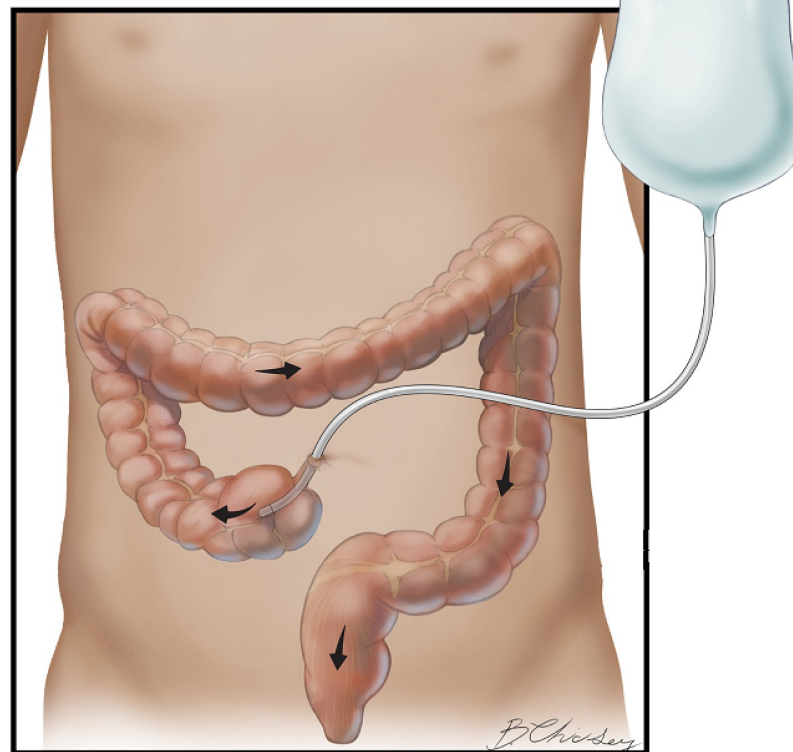




Rectal enema



Antegrade Enema







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Sigmoidectomy



Table 1: Clinical characteristics, previous treatments, and type of operation in eight children with idiopathic constipation complicated with megarectosigmoid and fecal incontinence.

Therapeutic intervention	Patient							
	1	2	3	4	5	6	7	8
Sex (male or female)	f	M	m	f	m	m	m	m
Years of constipation	4	5	15	12	10	8	6	6
Age at onset of constipation	1	9	4	2	2	1	1	6
Age at surgery	6	14	19	15	13	9	9	12
Different laxatives tried (n)	3	5	2	1	5	4	3	2
-polyethylene glycol	+	+	+	+	+	+	+	+
-bisacodyl	+	+	+		+		+	+
-sennosides	+	+			+	+	+	
-docusate		+			+	+		
-milk of magnesia						+		
-fiber					+			
-lubiprostone		+						
Botox		yes						
Clean out / disimpaction	2	2	1	1	1	5	1	3
Successful bowel management with enemas	+	+	+	+	+	+	NA ^a	NA ^b
Ganglion cells in rectum	+	+	+	+	+	+	+	+
Contrast enema	yes	yes	yes	yes	yes	yes	yes	yes
Autism specter disorder	+	-	-	-	+	+	-	+
Laparoscopic-assisted	no	yes	yes	yes	yes	yes	no	yes



A new operation for chronic idiopathic constipation

Transanal proximal rectosigmoid resection

Colorectal and Hirschsprung Center

Luis de la Torre, MD

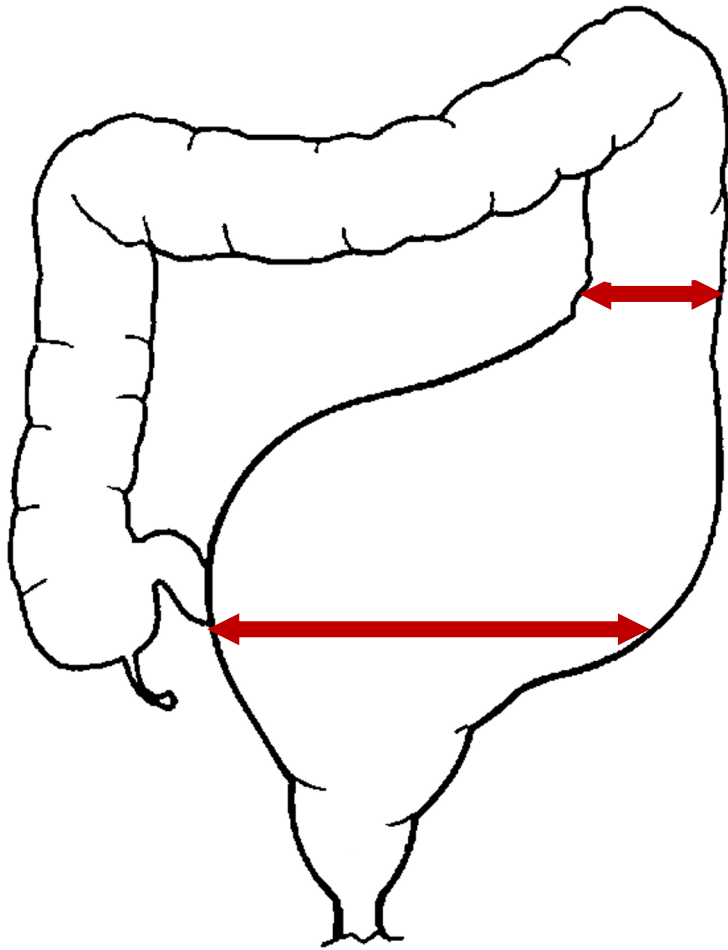
Lea Wehrli, MD

Kim Cogley RN



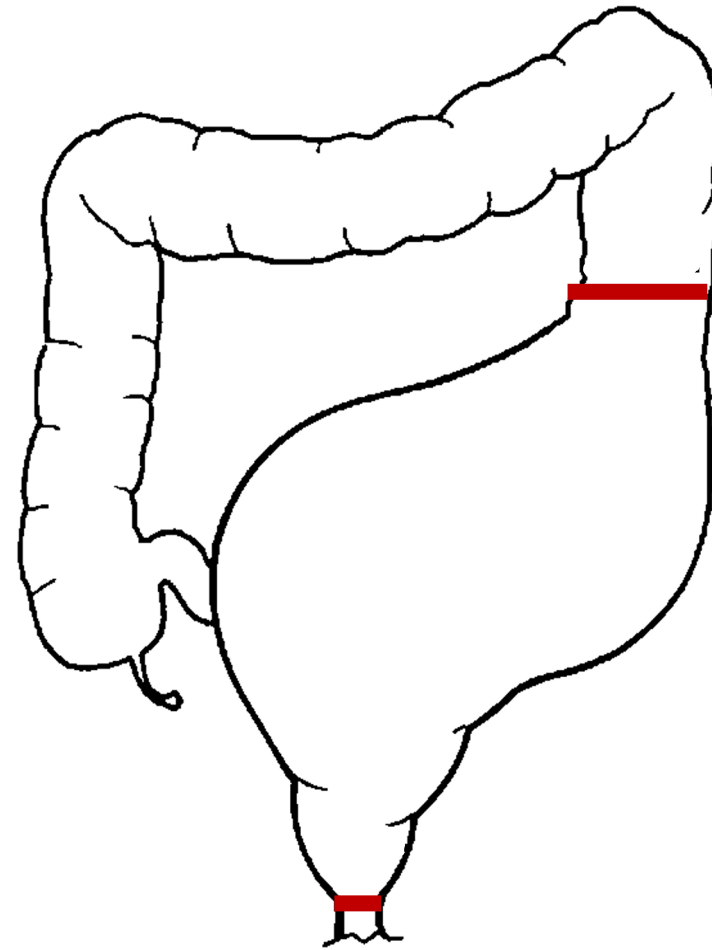
Children's
Hospital of Pittsburgh | of
UPMC

Sigmoidectomy



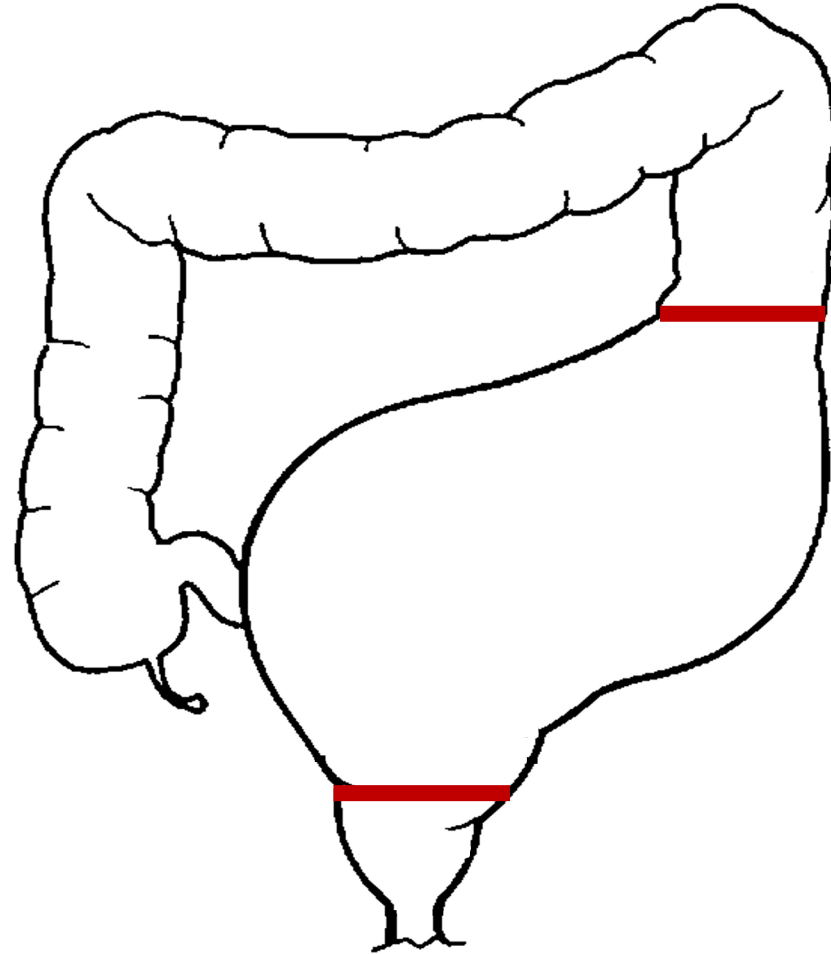
Peritoneal reflection

Transanal complete rectosigmoid resection

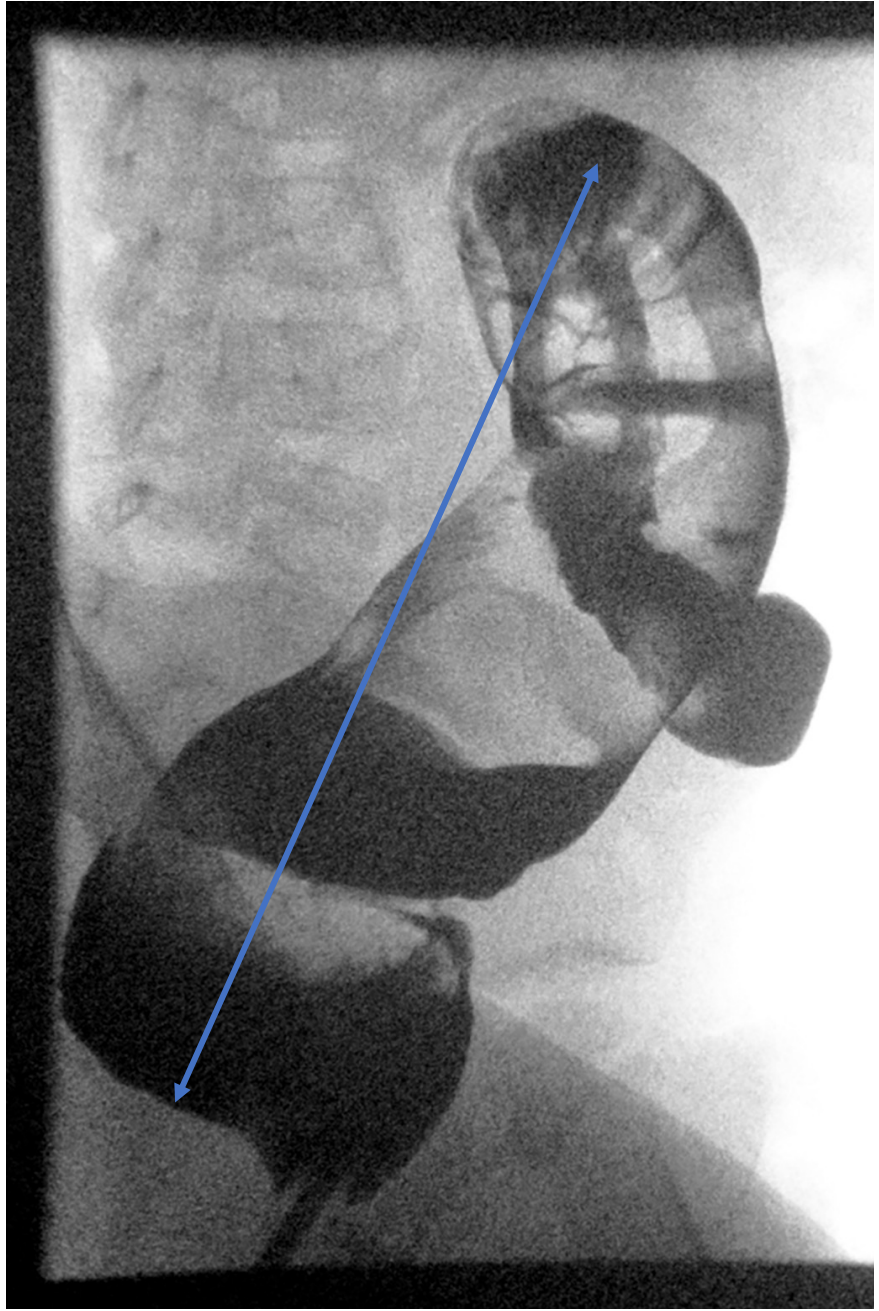


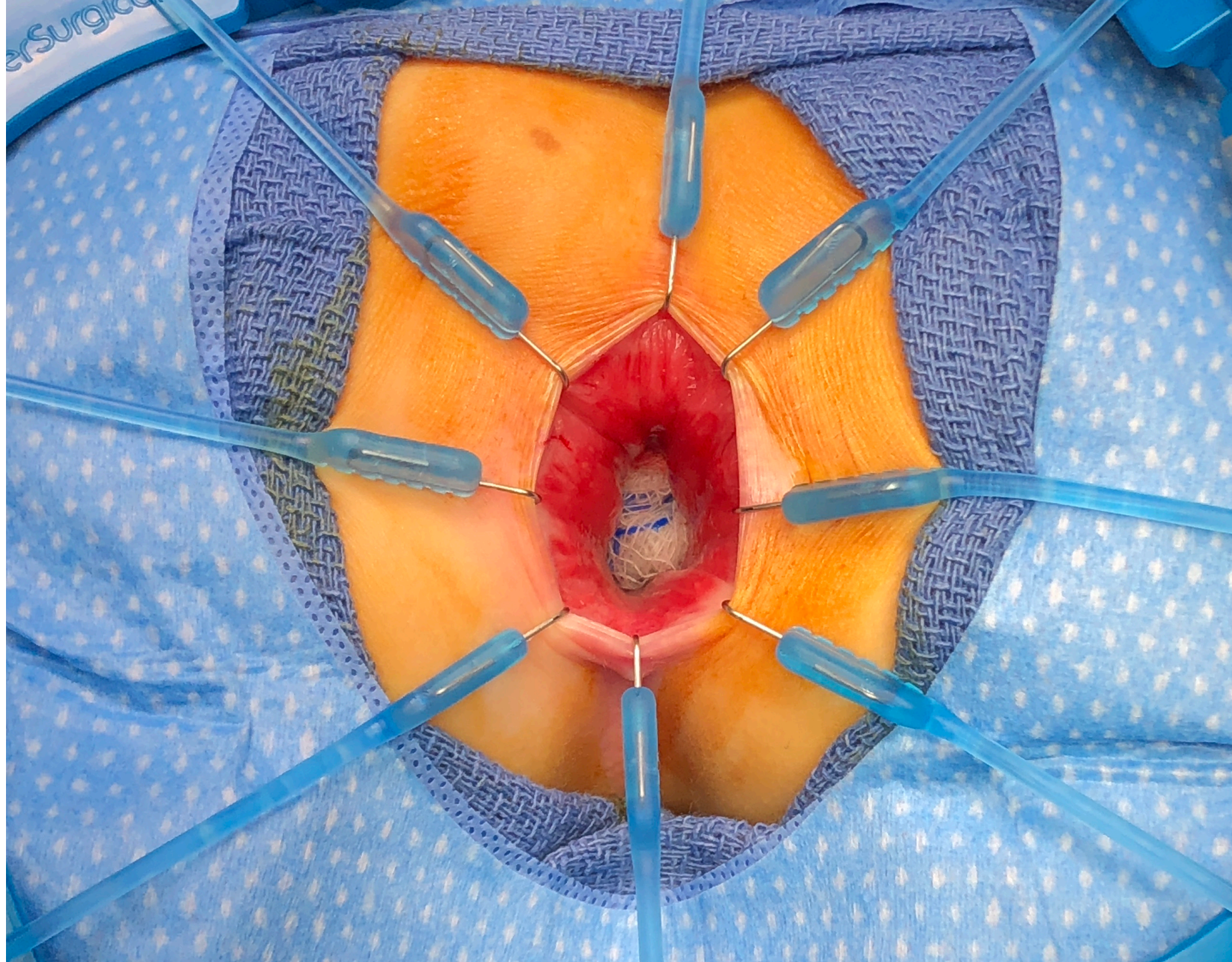
2 cm above pectinate area

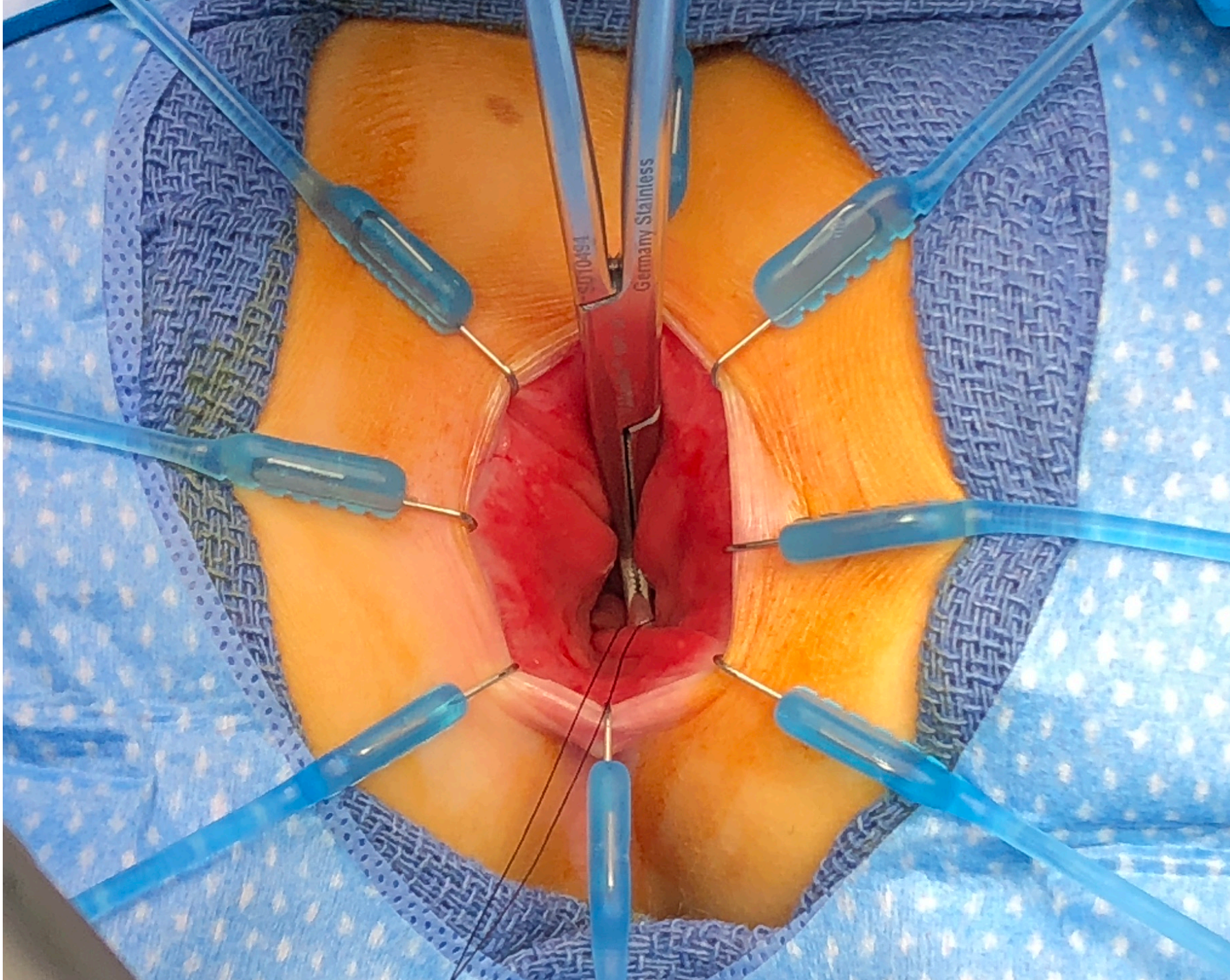
**Transanal partial
rectosigmoid resection**

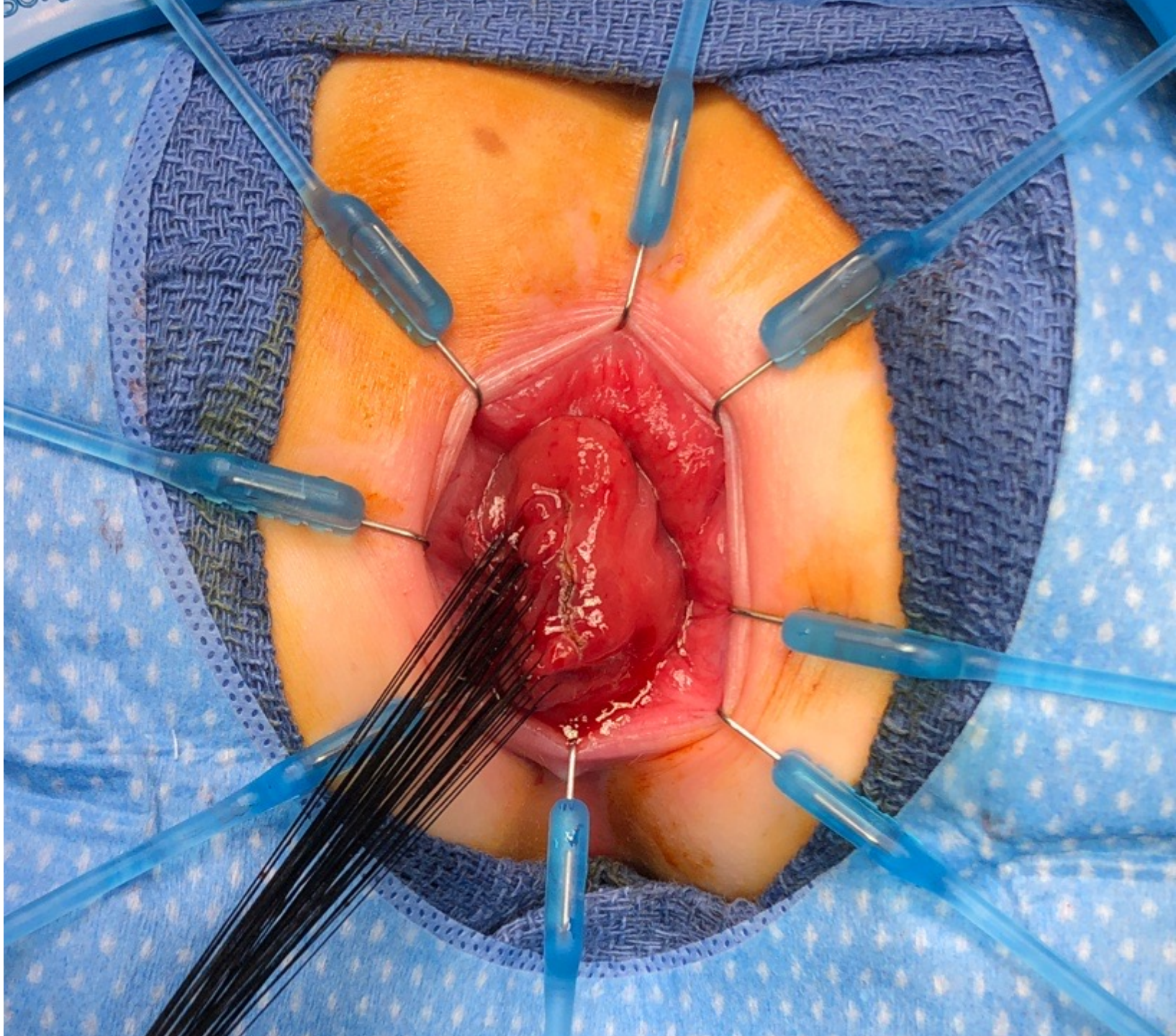


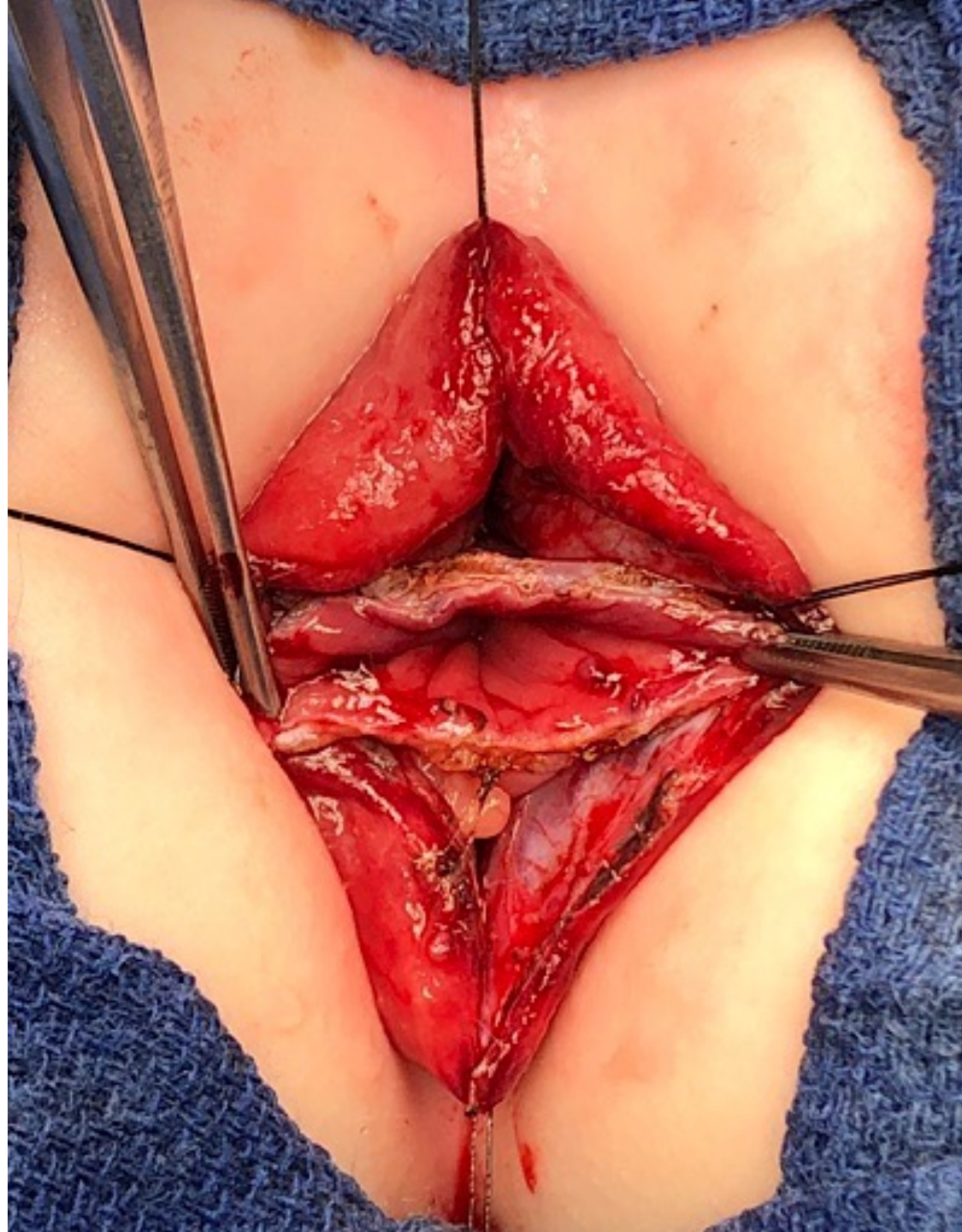
Leave 5 cm of rectal reservoir





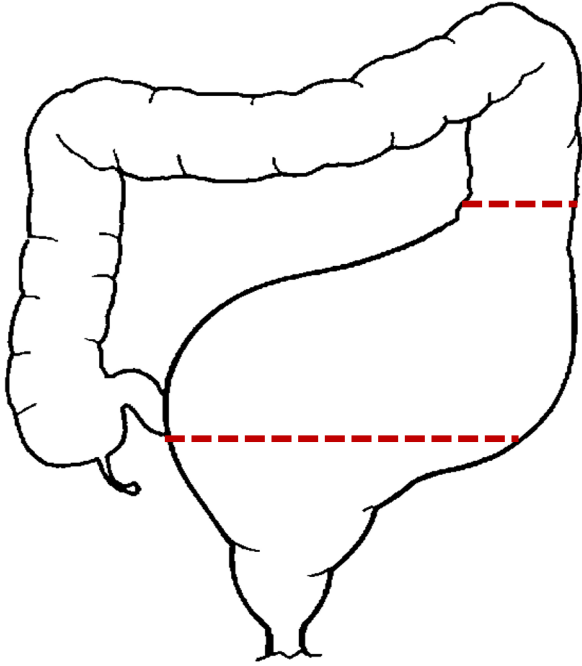






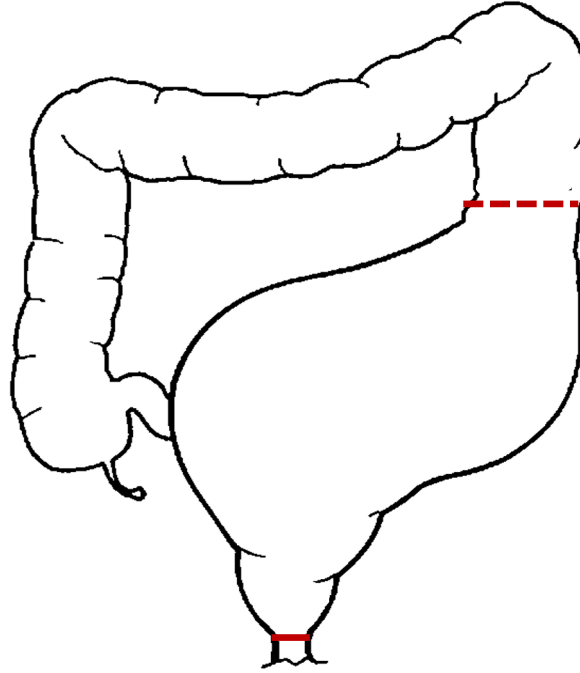


Sigmoidectomy



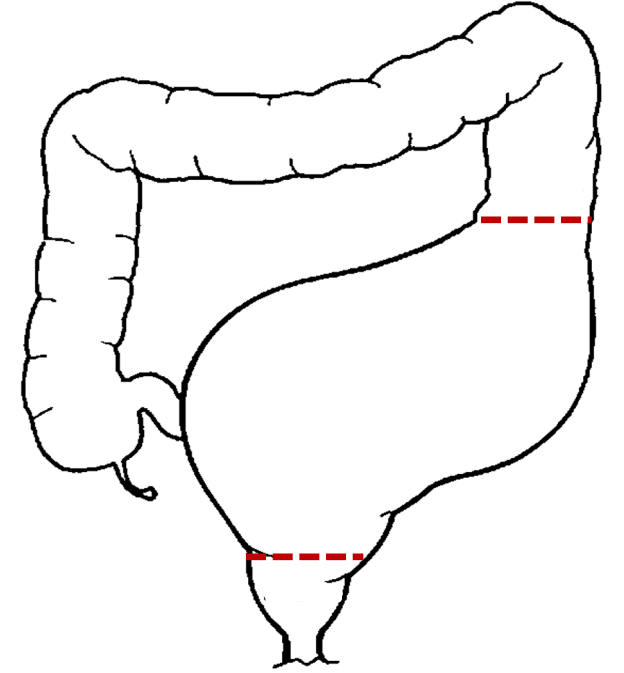
**Peritoneal
reflection**

Transanal rectosigmoid resection



**2 cm above
Pectinate area**

Transanal proximal rectosigmoid resection



**5 cm above
Pectinate area**

Cons

Leave the complete residual
sick reservoir (rectum)

Lack of reservoir (rectum)

Risk

Fecal impaction
Left abdominal pain
Obstructive symptoms

Fecal incontinence

8 patients with transanal partial rectosigmoid resection
July 2017 – April 2018

Gender	3 females 5 males
Age at surgery	3 to 19 years
Follow-up	1 to 10 months
Behavioral and mental issues	2 patients
Current treatment	6 sennosides 2 enemas

Number of squares of sennosides (15 mg) in six patients with transanal partial rectosigmoid resection

Pre operation	Post operation
10	2
35	5
10	2
Polyethylene Glycol 3350	3.5
10	2
5	1

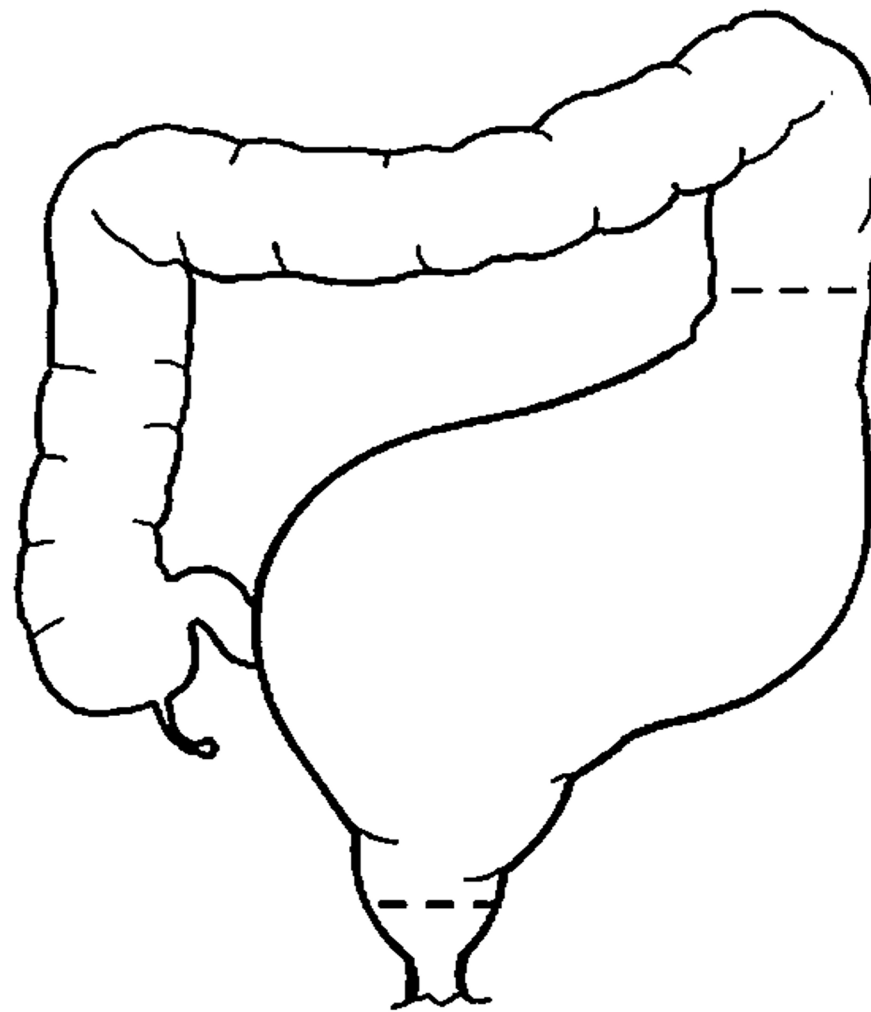
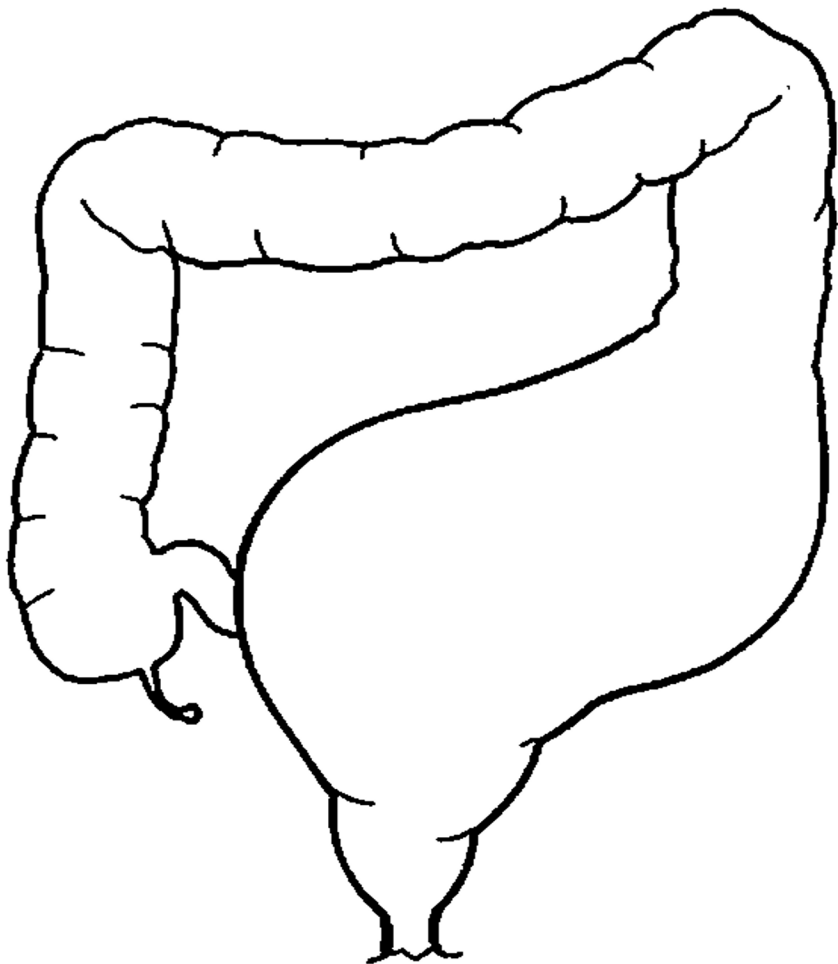


El recto es como un globo que se infla (llena de materia fecal) y desinfla (con cada evacuación)

Lo importante es

“no inflarlo exageradamente y permitir su desinflado completo”.

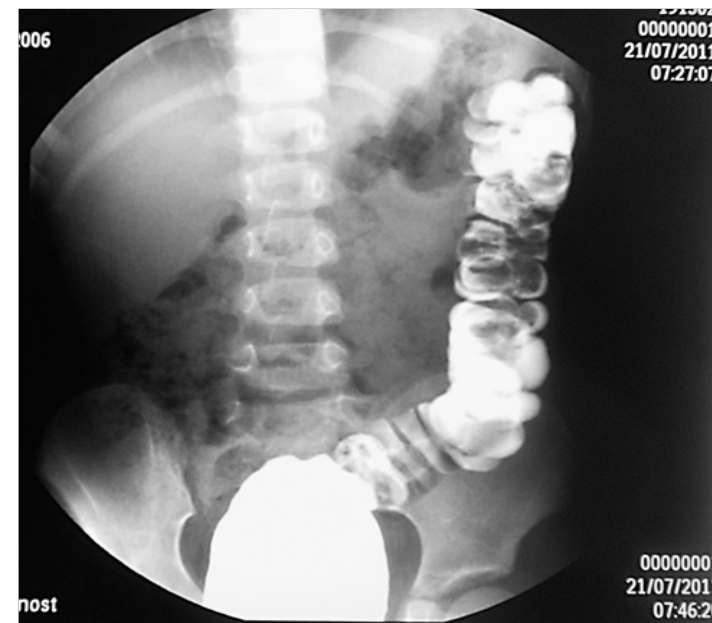
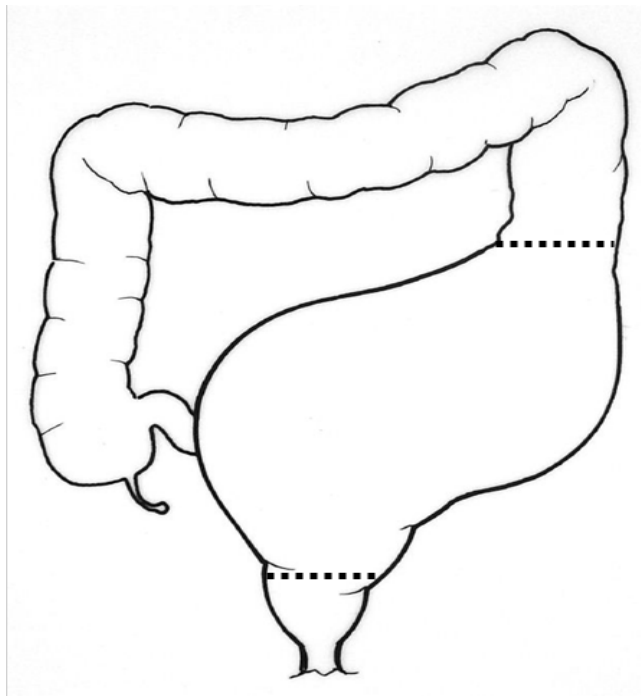
Sigmoidectomía



Sigmoidectomía



Sigmoidectomía



Enema continente anterógrado

Vía alterna para administrar el enema

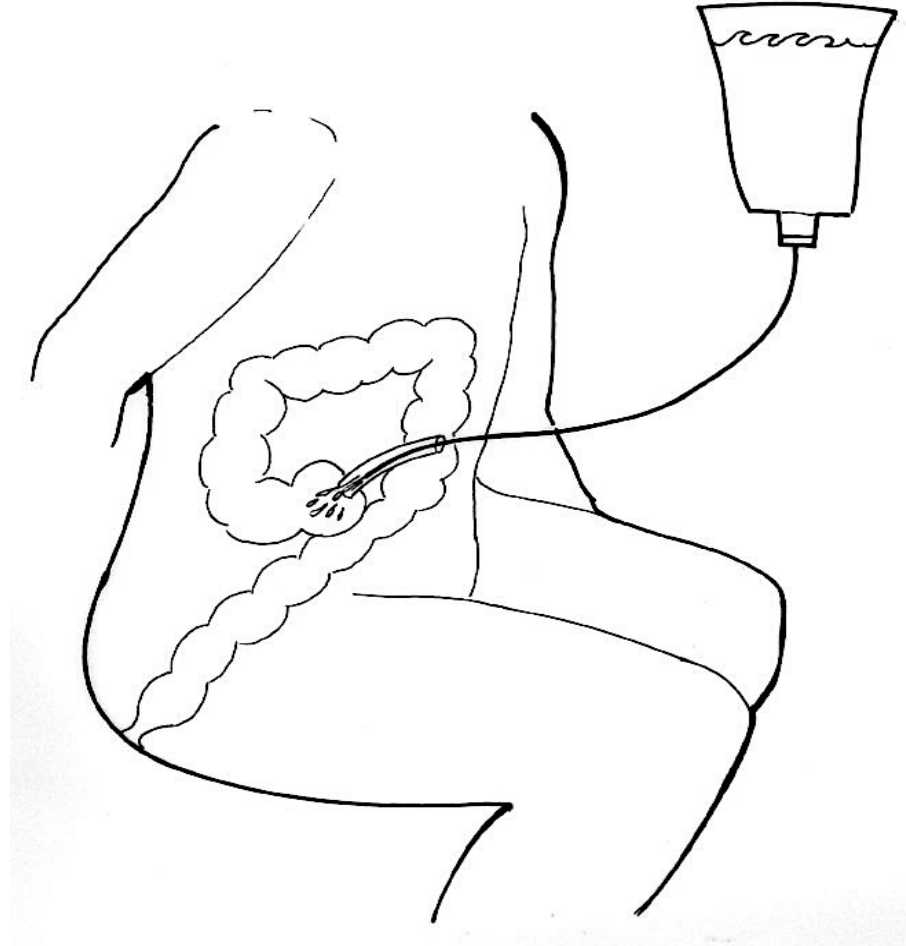
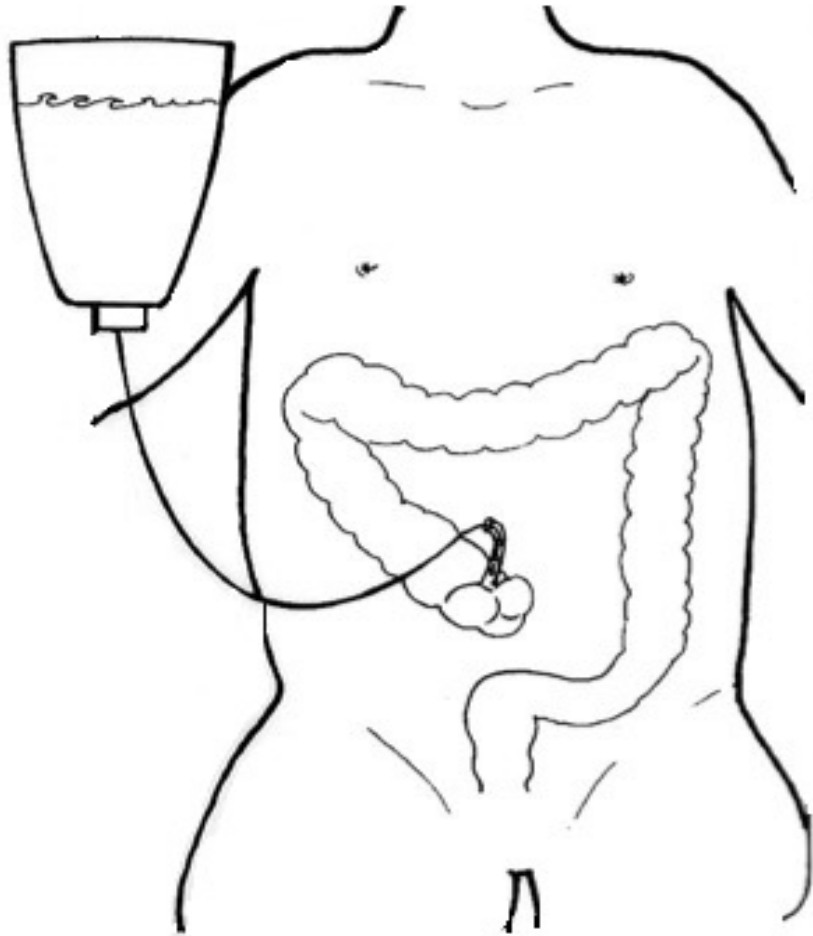
Requiere de un Programa de Control Intestinal exitoso con enemas

Requiere un procedimiento quirúrgico

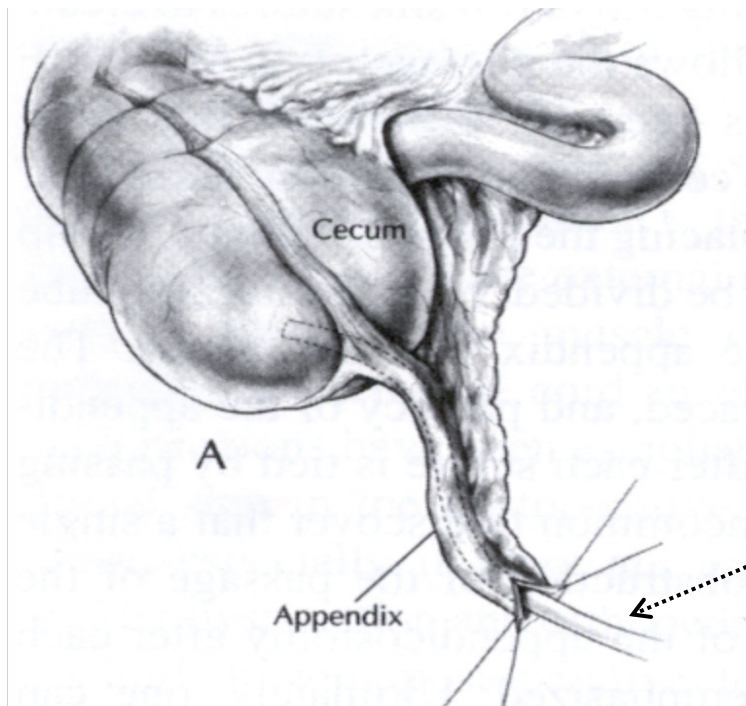
Mas comfortable

Más fisiológico

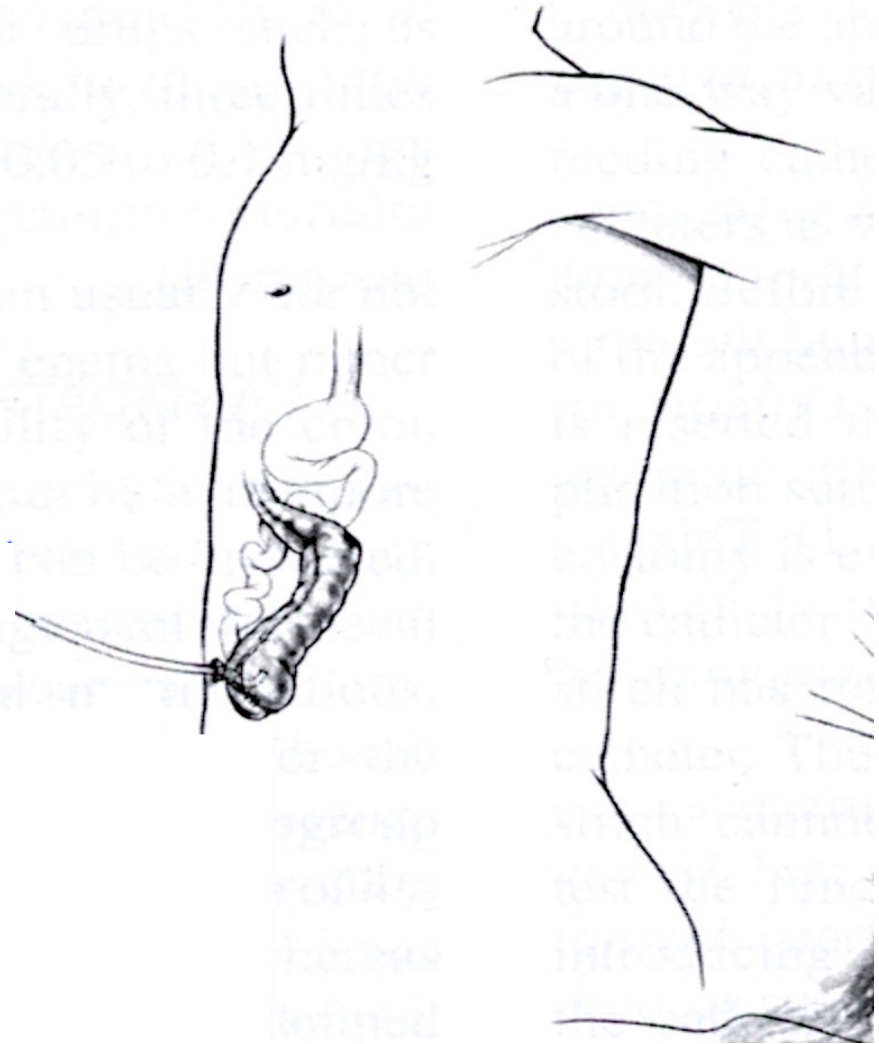
Enema continente anterógrado



Apendicostomía



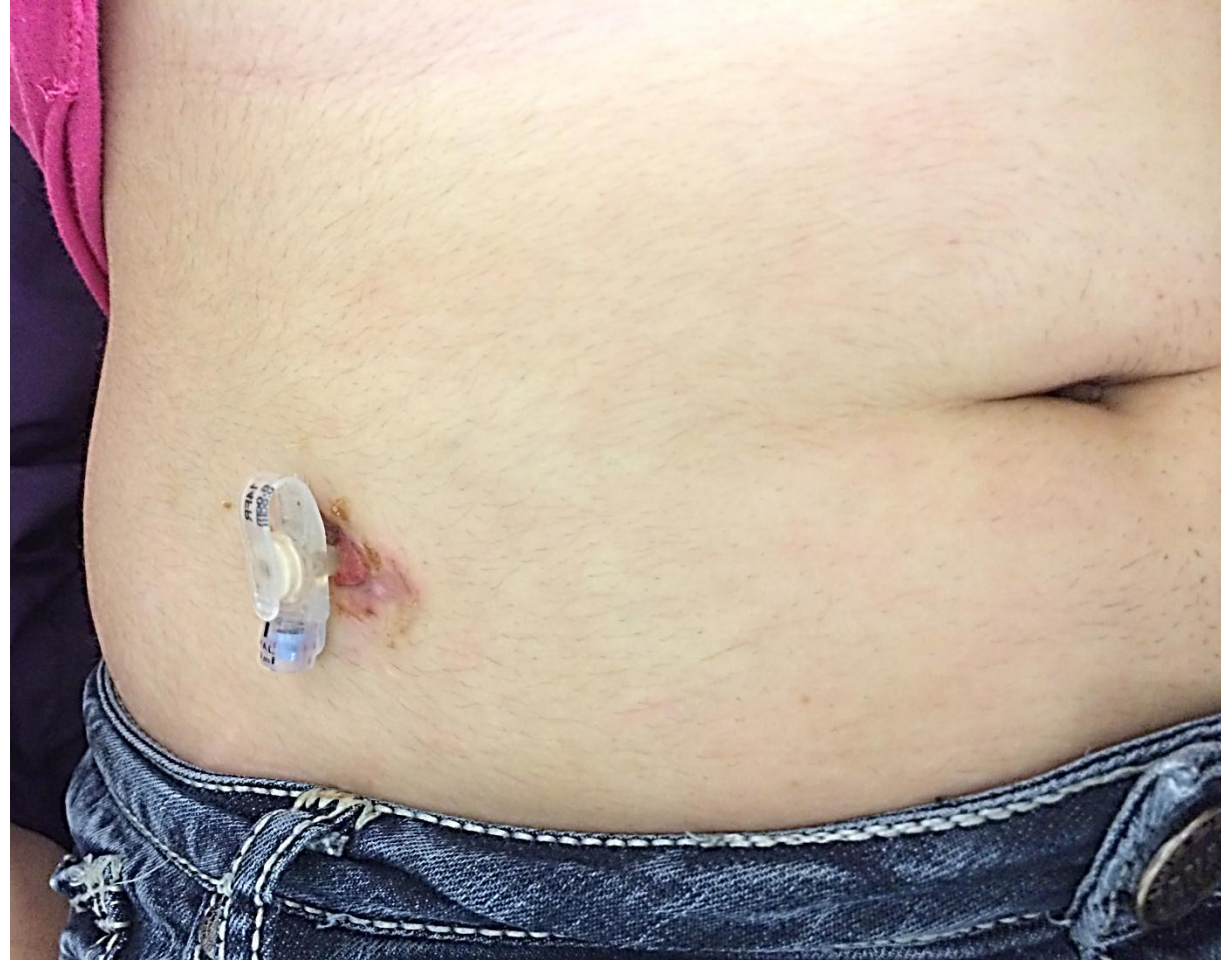
Enema



Appendicostomía



Cecostomía



Insertion del catéter por el paciente



Primary sigmoidectomy and appendicostomy for chronic idiopathic constipation

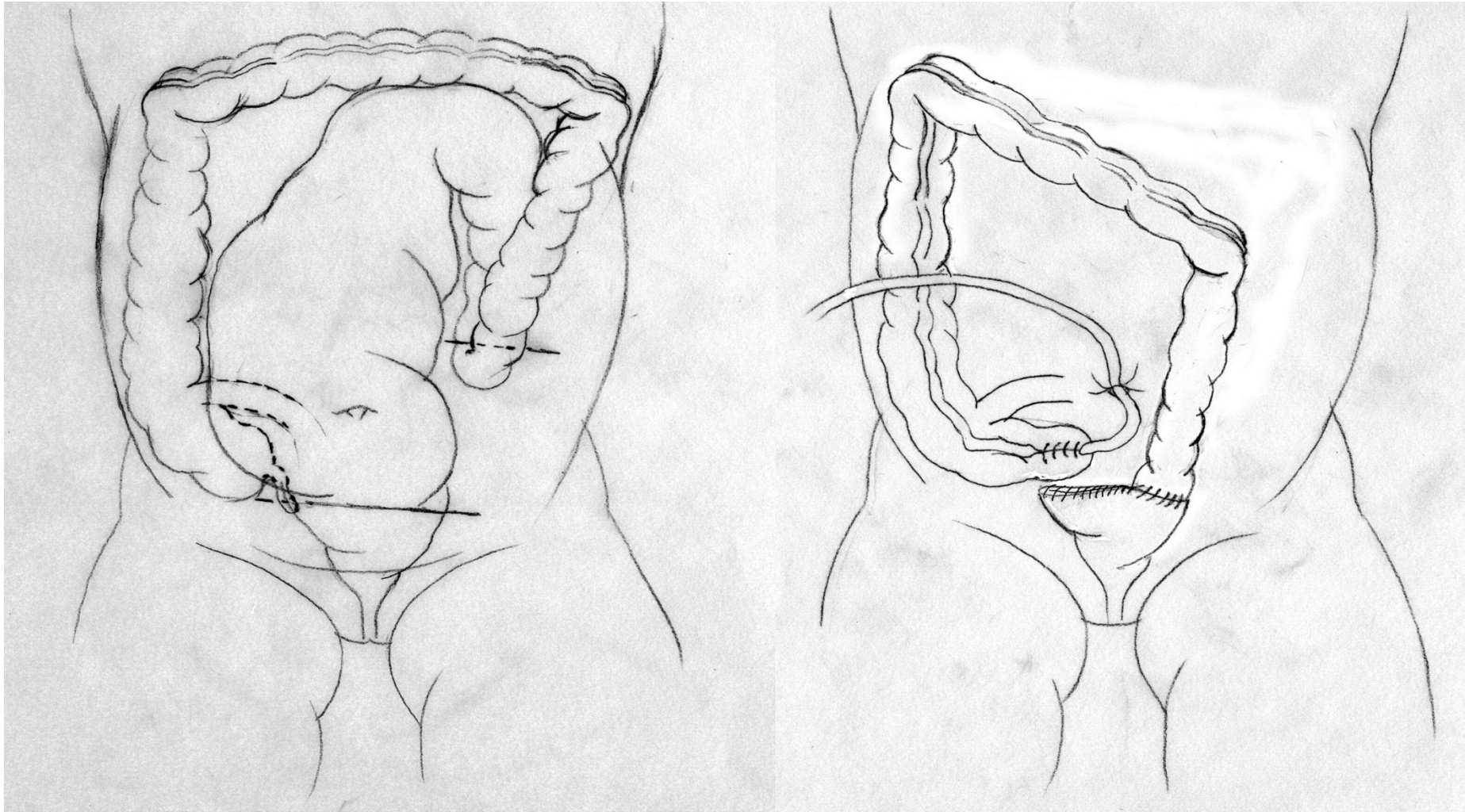


Table 1: Clinical characteristics, previous treatments, and type of operation in eight children with idiopathic constipation complicated with megarectosigmoid and fecal incontinence.

Therapeutic intervention	Patient							
	1	2	3	4	5	6	7	8
Sex (male or female)	f	M	m	f	m	m	m	m
Years of constipation	4	5	15	12	10	8	6	6
Age at onset of constipation	1	9	4	2	2	1	1	6
Age at surgery	6	14	19	15	13	9	9	12
Different laxatives tried (n)	3	5	2	1	5	4	3	2
-polyethylene glycol	+	+	+	+	+	+	+	+
-bisacodyl	+	+	+		+		+	+
-sennosides	+	+			+	+	+	
-docusate		+			+	+		
-milk of magnesia						+		
-fiber					+			
-lubiprostone		+						
Botox		yes						
Clean out / disimpaction	2	2	1	1	1	5	1	3
Successful bowel management with enemas	+	+	+	+	+	+	NA ^a	NA ^b
Ganglion cells in rectum	+	+	+	+	+	+	+	+
Contrast enema	yes	yes	yes	yes	yes	yes	yes	yes
Autism specter disorder	+	-	-	-	+	+	-	+
Laparoscopic-assisted	no	yes	yes	yes	yes	yes	no	yes

A new operation for chronic idiopathic constipation

Transanal proximal rectosigmoid resection

Colorectal and Hirschsprung Center
Luis de la Torre, MD
Lea Wehrli, MD
Kim Cogley RN



Mega-recto-sigmoid related to chronic complicated constipation

Anorectal malformations

Sigmoidectomy +Swenson
Sigmoidectomy + Soave
Sigmoidectomy only



Residual constipation
Fecal incontinence
Good results? (improving fecal control)

1. Raffensperger. Megarectum: A Rare Complication of Imperforate Anus Repair and Its Surgical Correction by Endorectal Pullthrough. J Pediatr Surg 1982
2. Cloutier. Focal Ectasia of the Terminal Bowel Accompanying Low Anal Deformities. J Pediatr Surg 1987
3. Grosfeld. The Atonic Baggy Rectum: A Cause of Intractable Obstipation After Imperforate Anus Repair. J Pediatr Surg 1992
4. Peña. Megasigmoid: A Source of Pseudoincontinence in Children With Repaired Anorectal Malformations. J Pediatr Surg 1993

“Constipation in children is a familiar and frustrating problem”

Anal procedures
• Sphincter myectomy or myotomy
• Botulinum toxin (Botox) injection
Antegrade colonic enemas
• Appendicostomy
• Cecostomy
Colorectal resection
• Segmental resection (e.g., rectosigmoidectomy)
• Subtotal colectomy
• Total proctocolectomy
Intestinal diversion
• Ileostomy
• Colostomy

Cheng and Goldstein. Surgical Management of Idiopathic Constipation in Pediatric Patients
Clin Colon Rectal Surg 2018;31:89–98.

Megarectosigmoid related to chronic complicated Idiopathic constipation

Sphincter myectomy

Botox and myectomy

Botox

Exam under anesthesia + anal dilations

Anal dilations

Pull-through

Pull-through + Resection + anastomosis + stoma

Stoma + Resection + anastomosis

Resection + anastomosis

Resection + Cecostomy

ACE + Resection + pull-through + stoma

ACE + Stoma + Resection + anastomosis

Cecostomy

ACE

Left Colostomy button



Frequency improvement

Clinical symptoms improvement

Continence

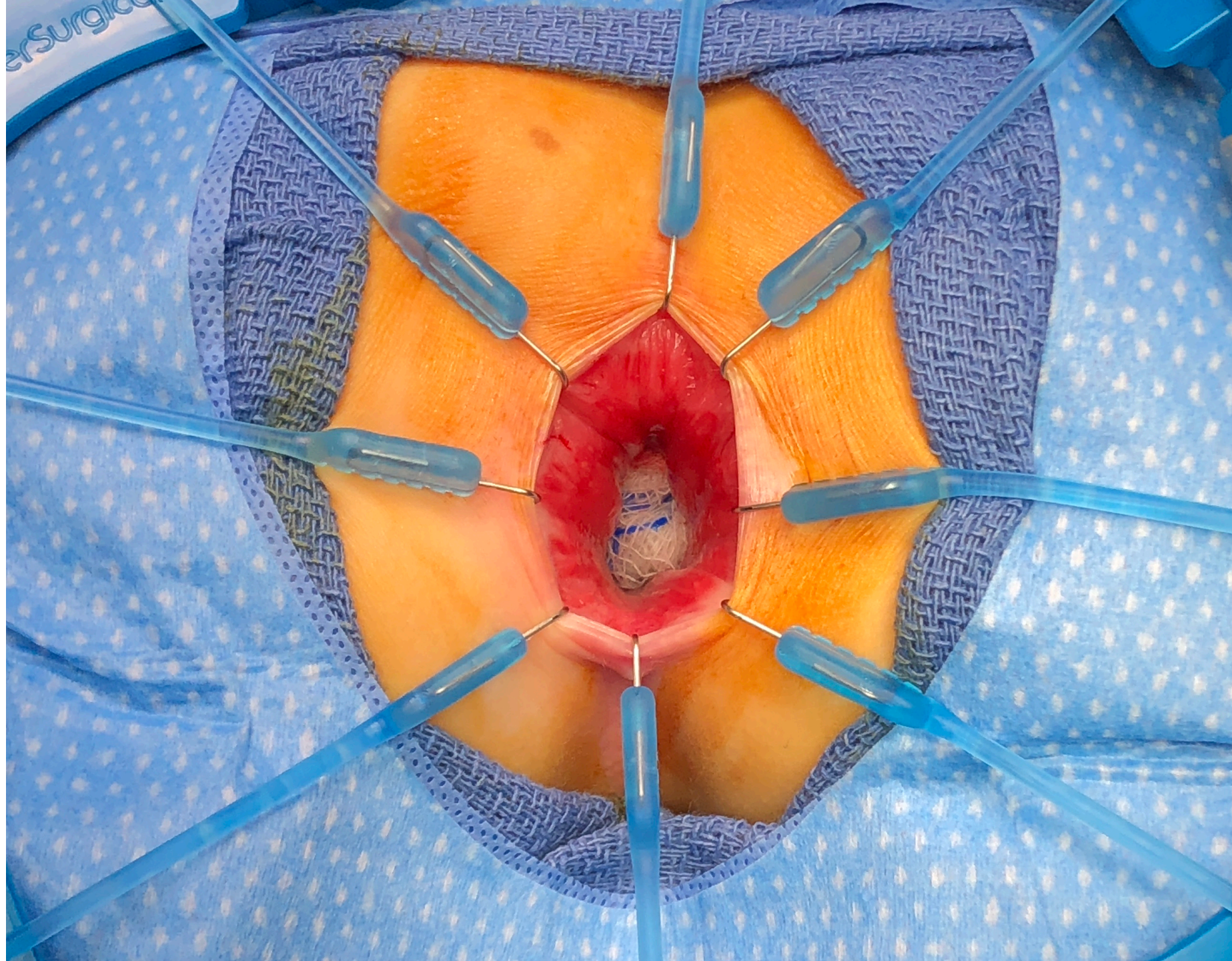
Soiling

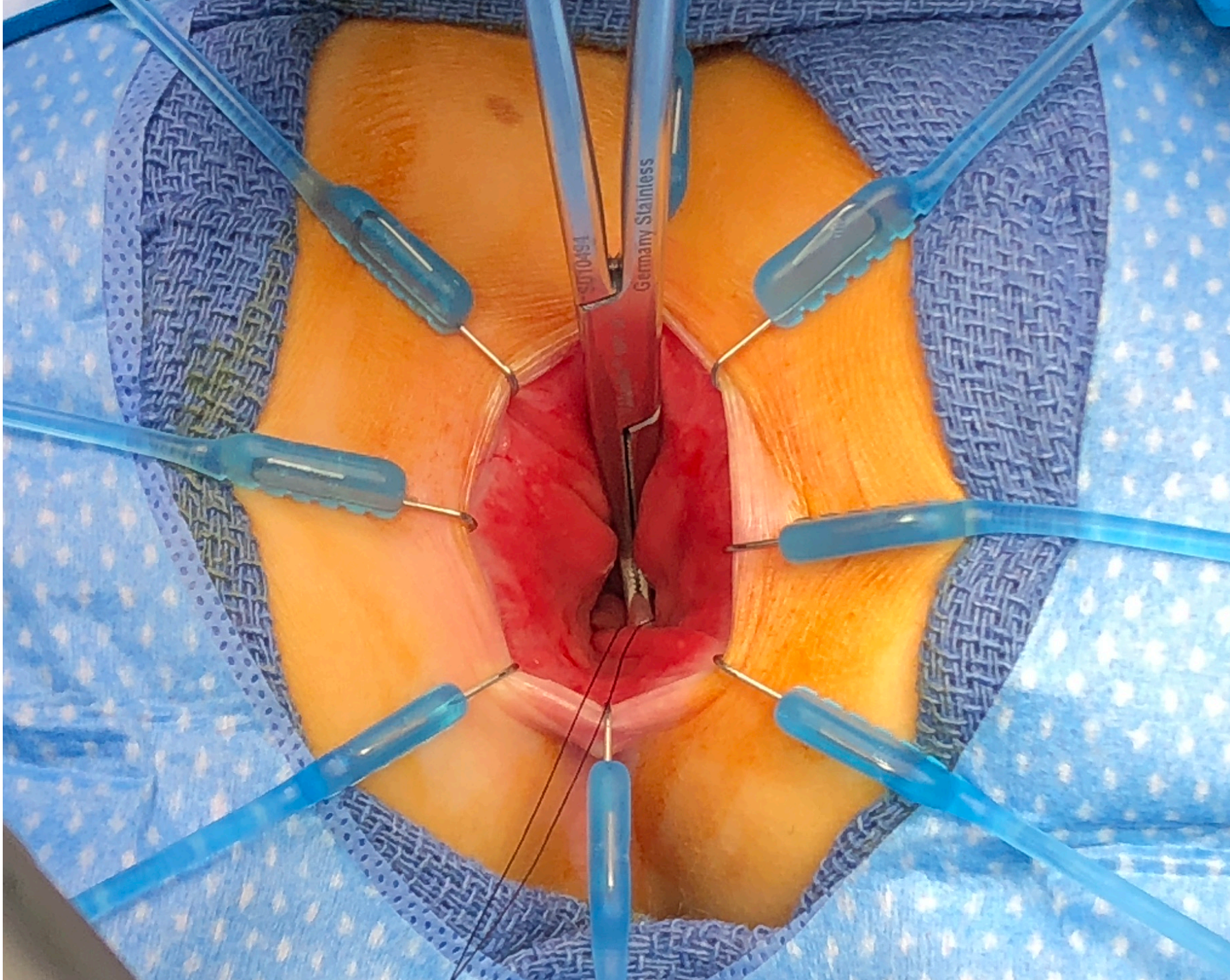
Parents judgment

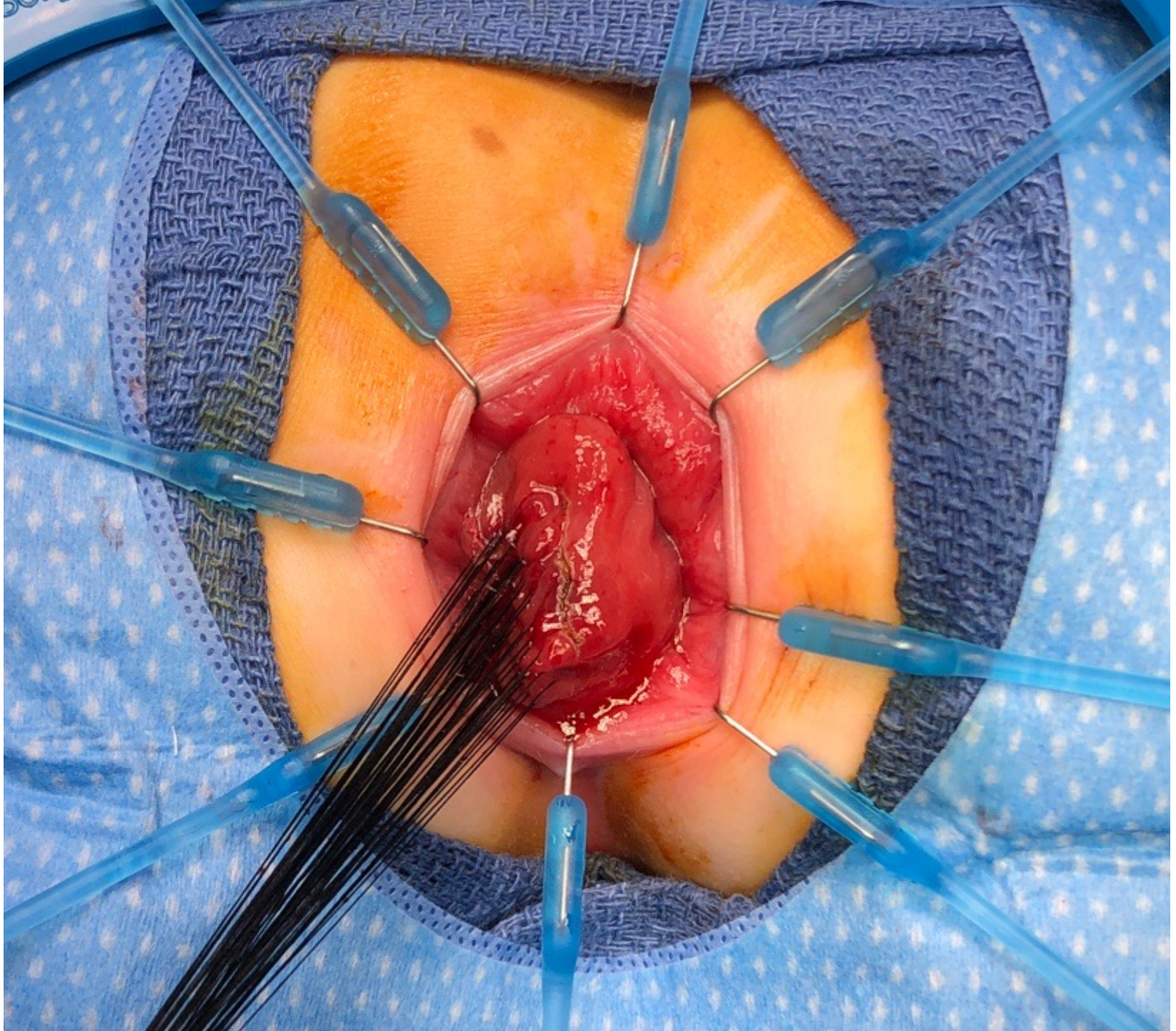
School attendance

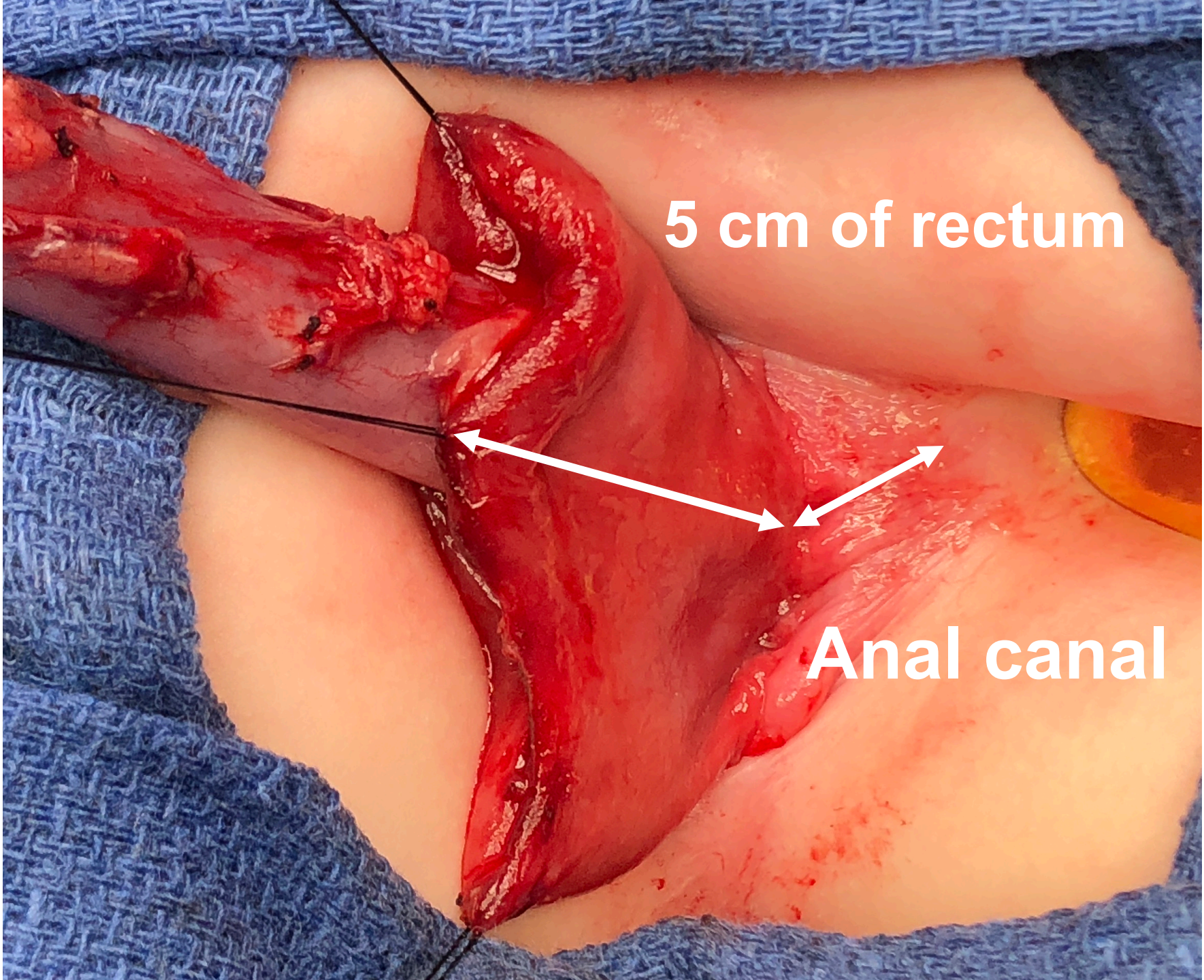
Quality of life scores

Laxative reduction



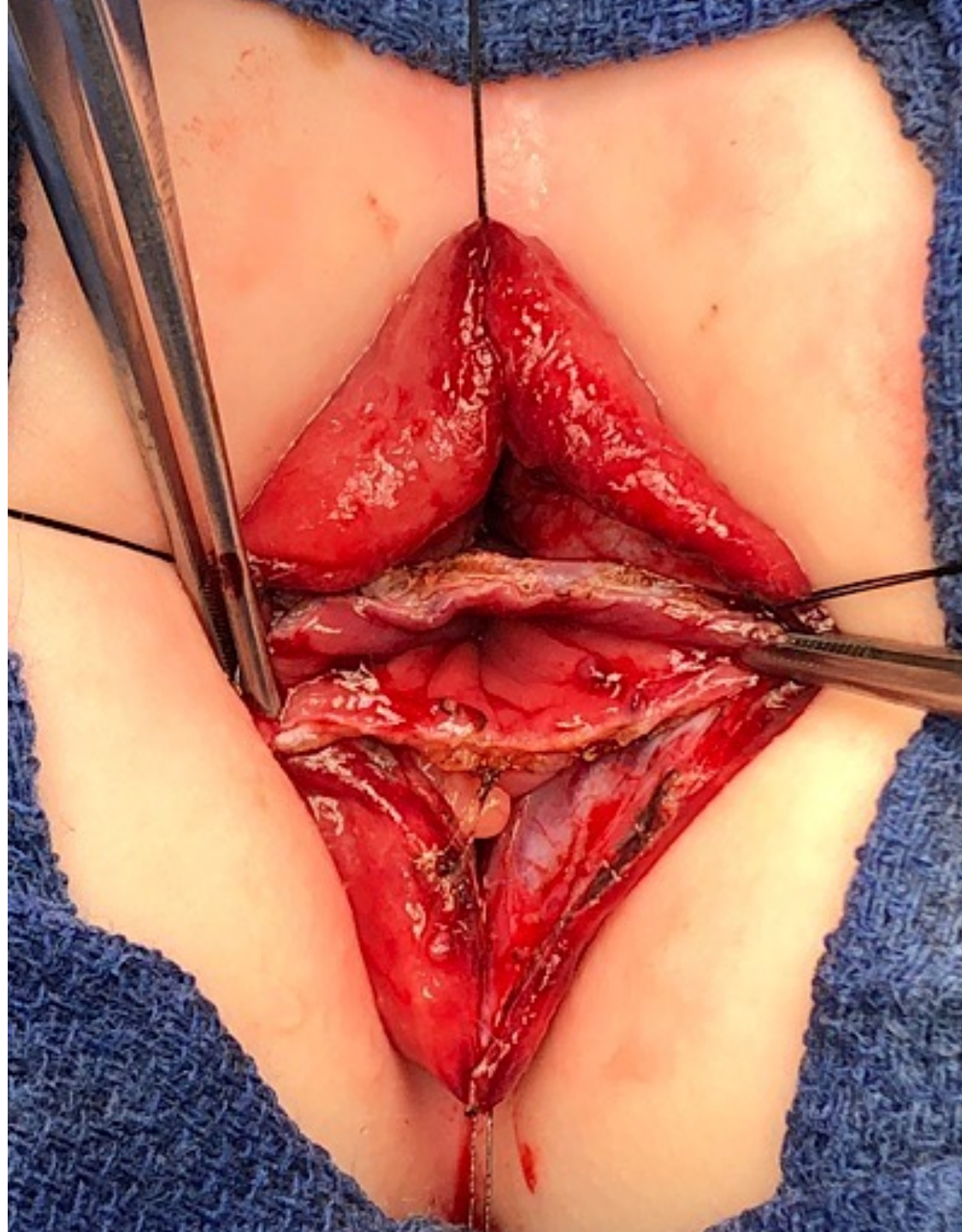






5 cm of rectum

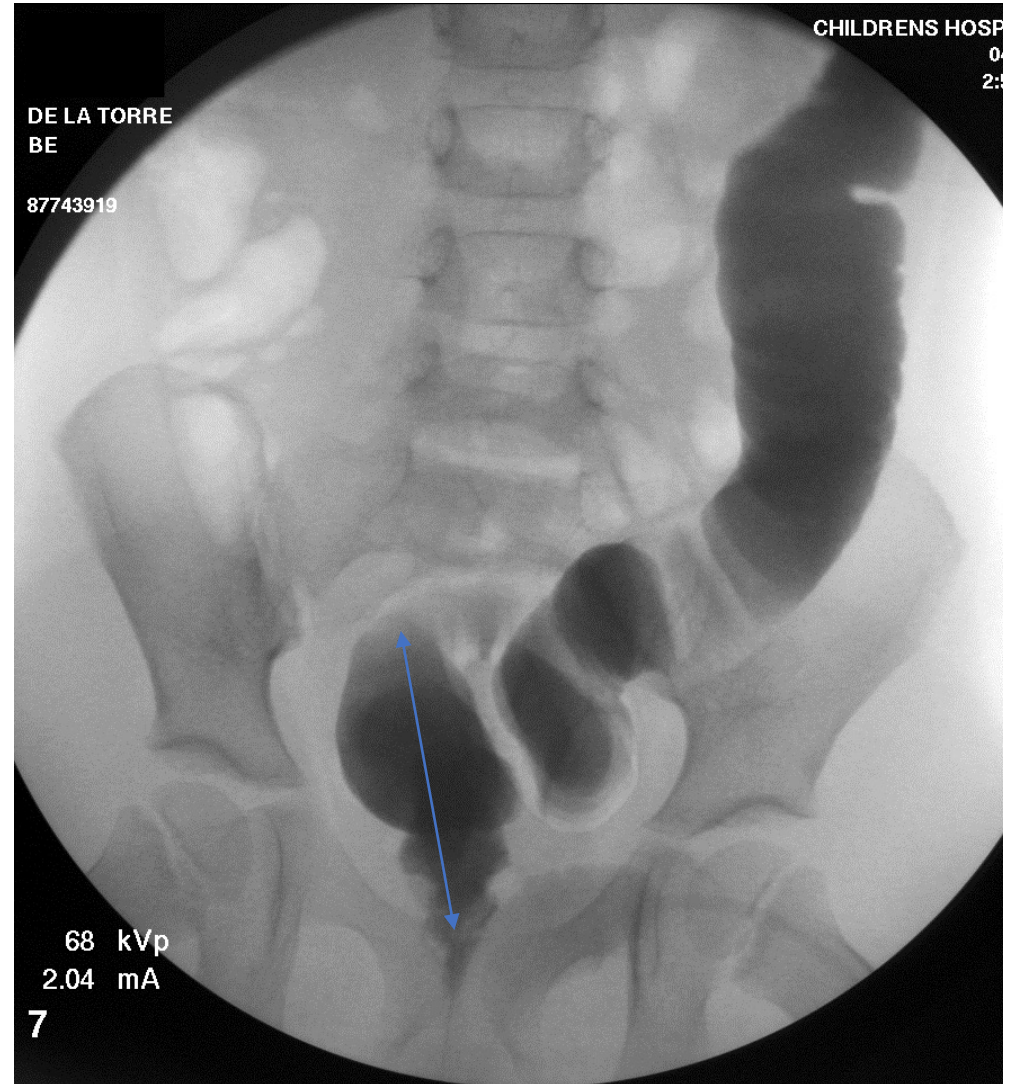
Anal canal





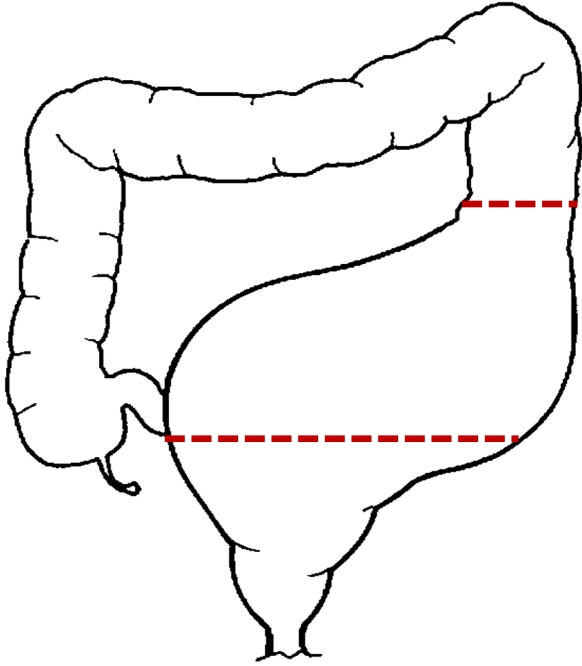


Preoperative



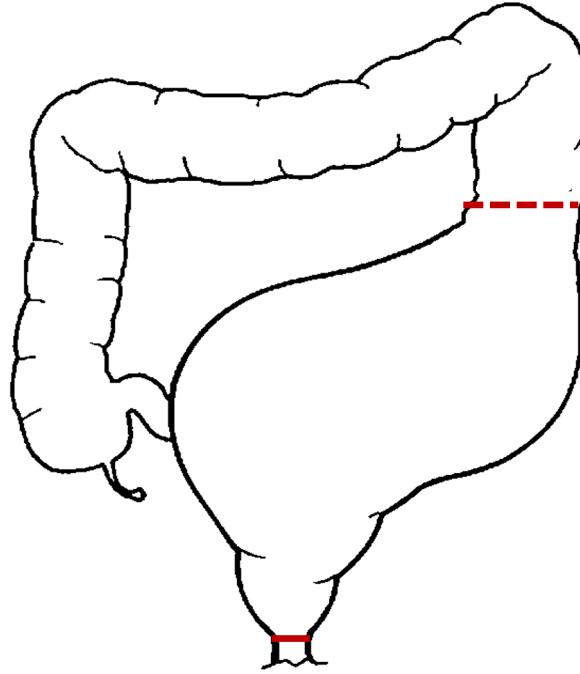
Postoperative

Sigmoidectomy



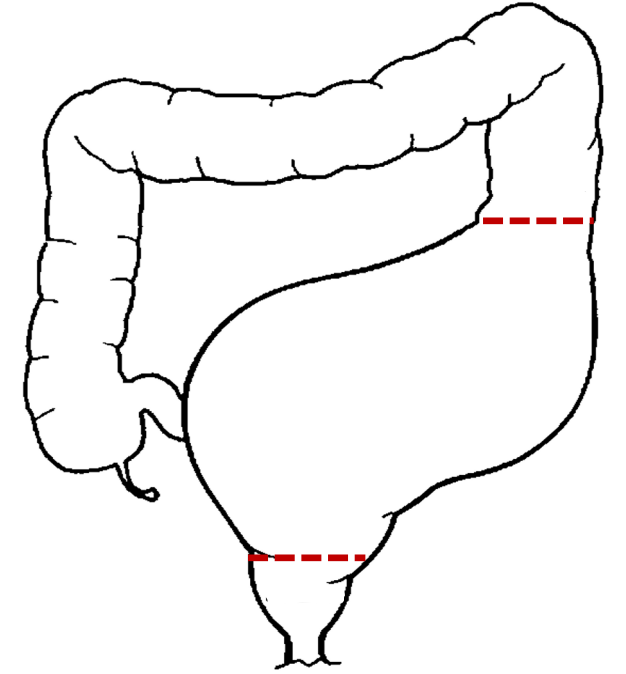
Peritoneal reflection

Transanal rectosigmoid resection



2 cm above Pectinate area

Transanal proximal rectosigmoid resection



5 cm above Pectinate area

Cons

Leave the complete residual sick reservoir (rectum)

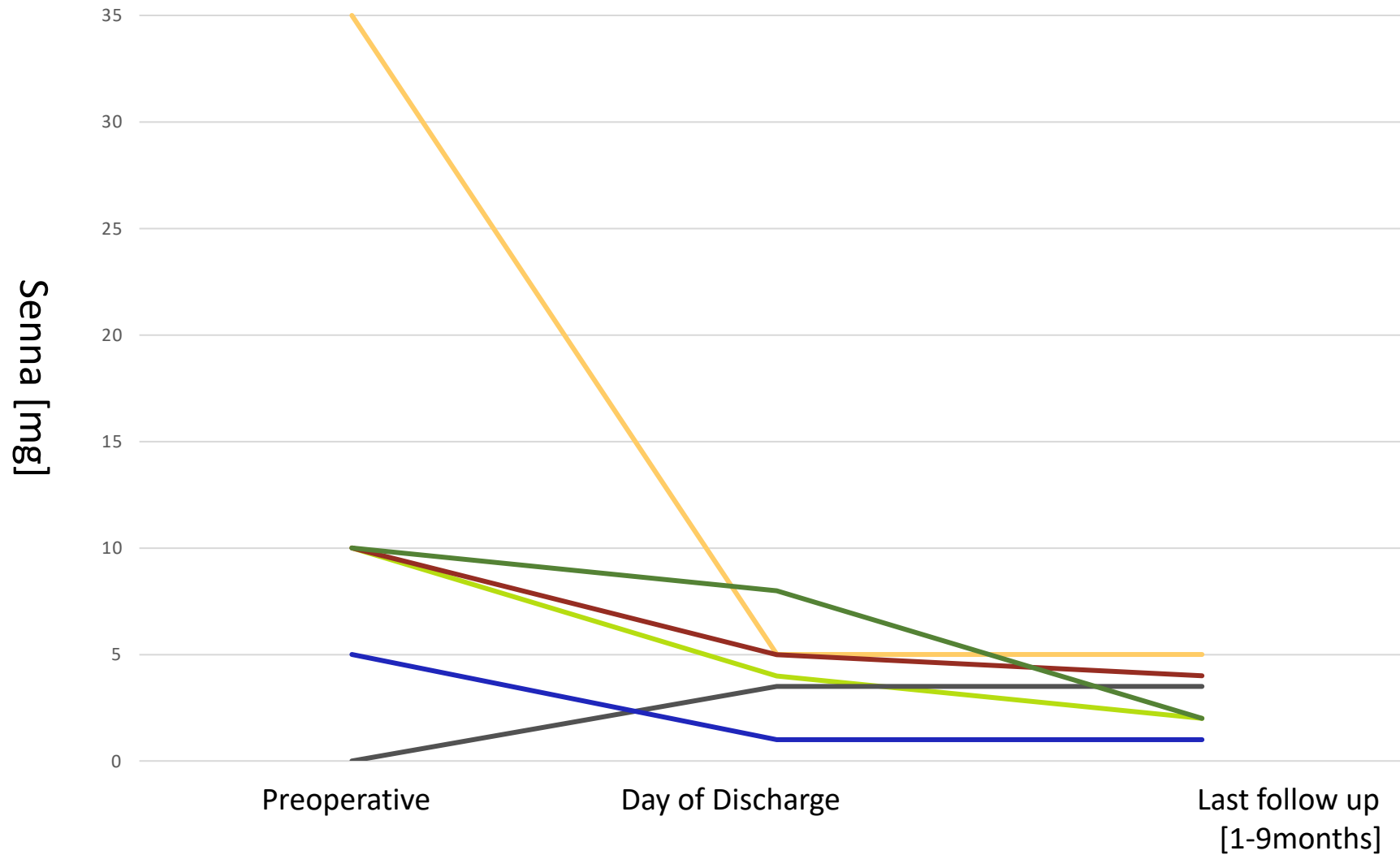
Lack of reservoir (rectum)

Risk

Fecal impaction
Left abdominal pain
Obstructive symptoms

Fecal incontinence

6 Transanal Proximal Rectosigmoid resection



No fecal impaction
All have fecal control



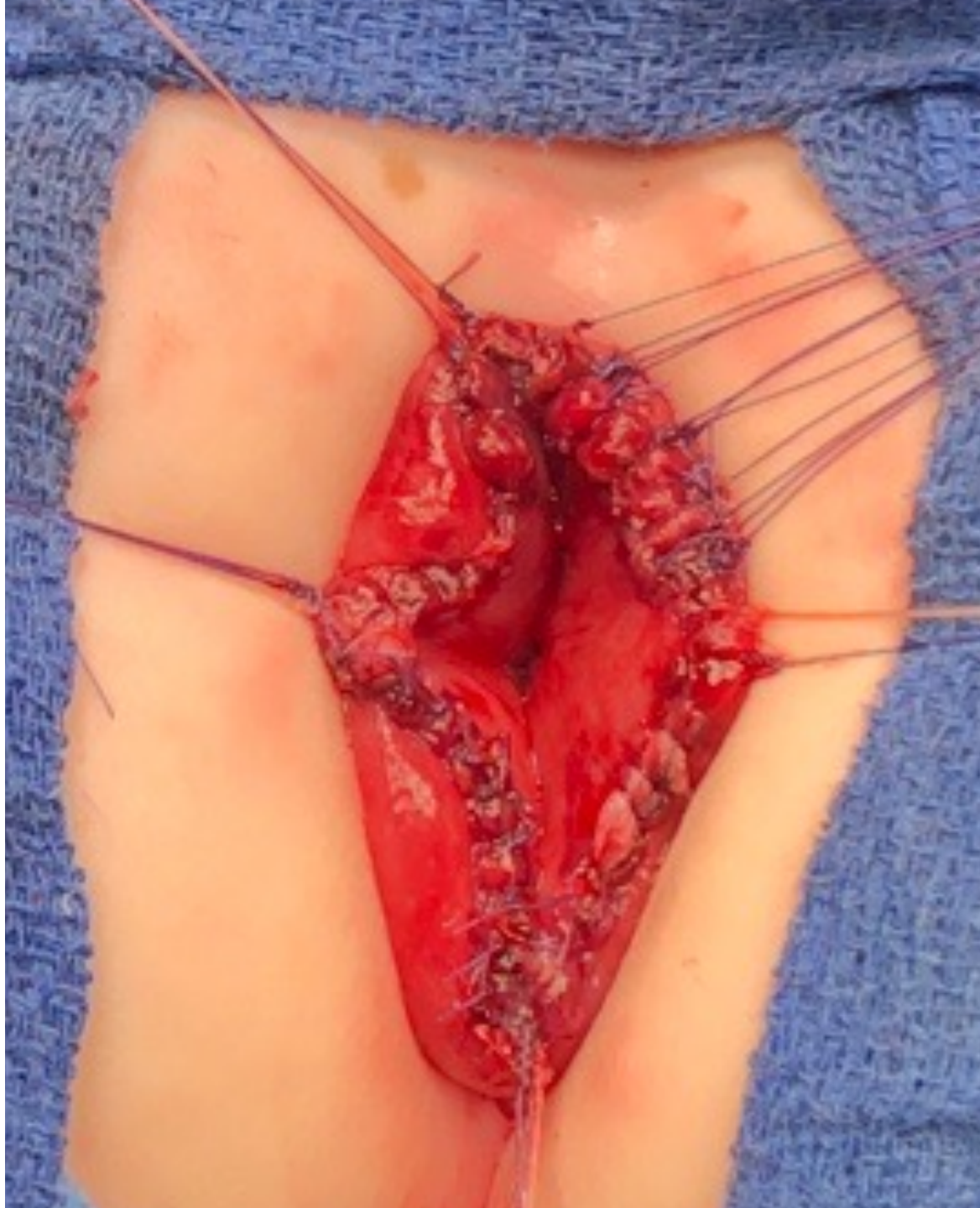
*Colorectal and Hirschsprung Center for Children
Children's Hospital of Pittsburgh
University of Pittsburgh Medical Center*

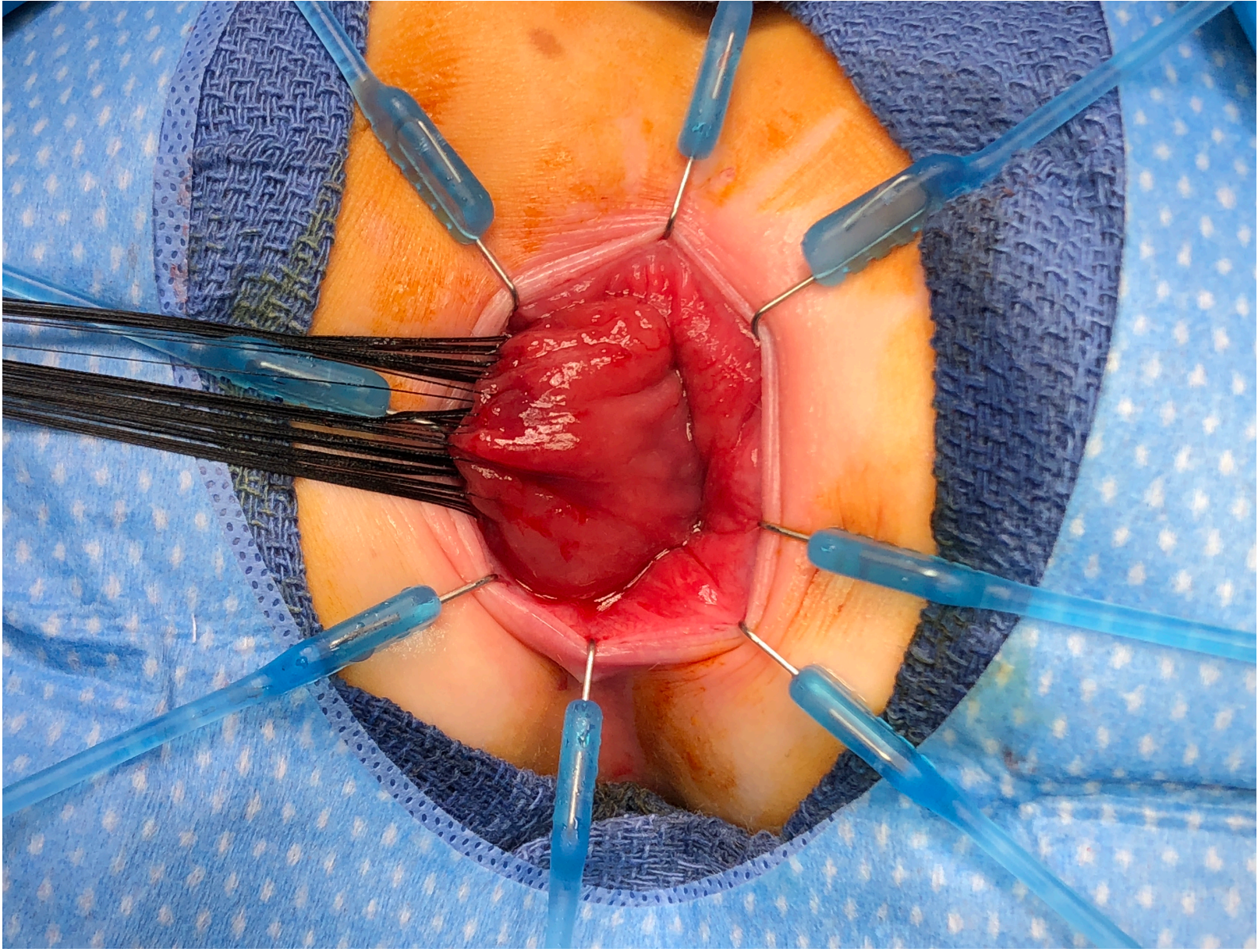
Thank you very much

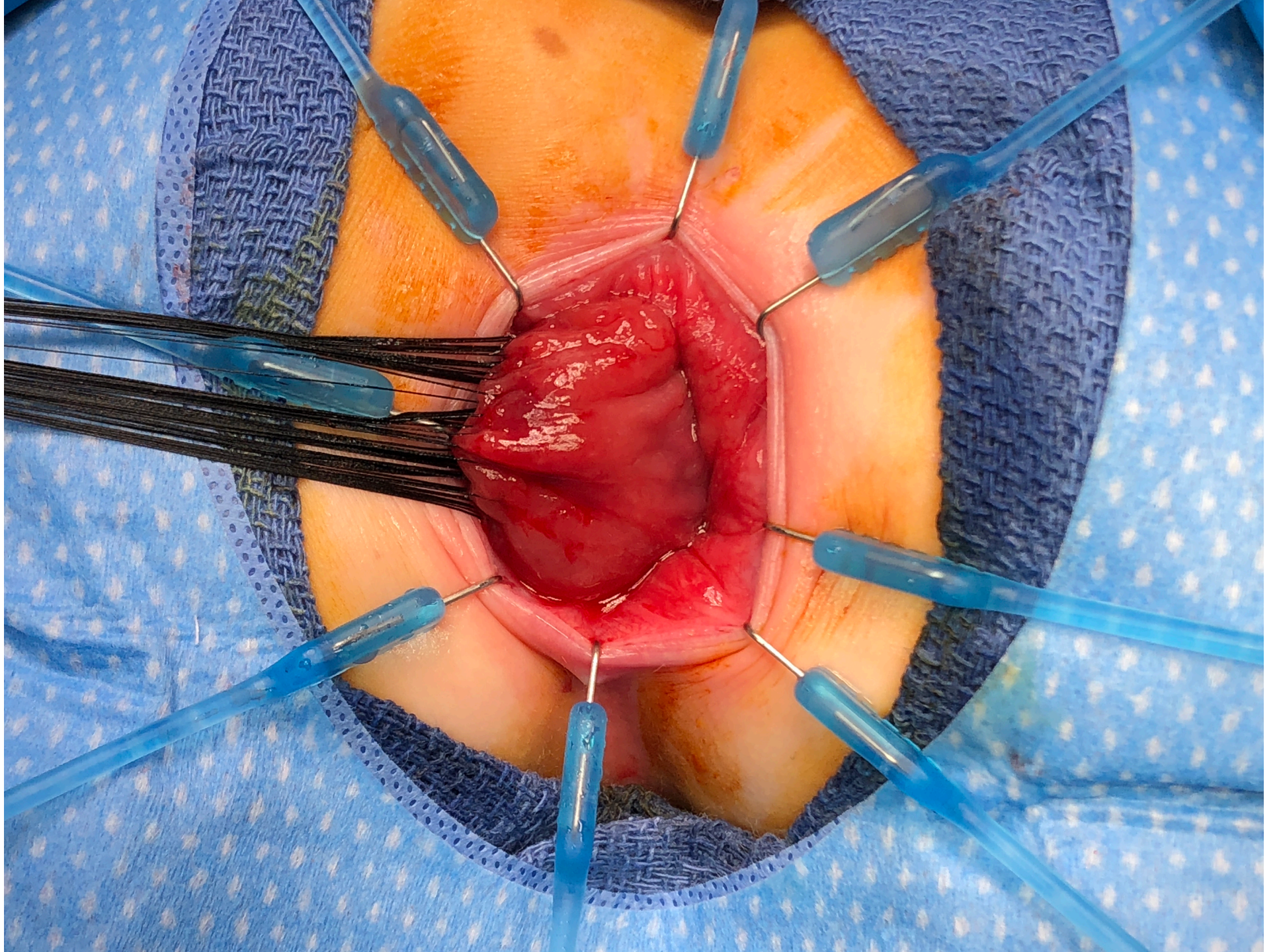
981125599

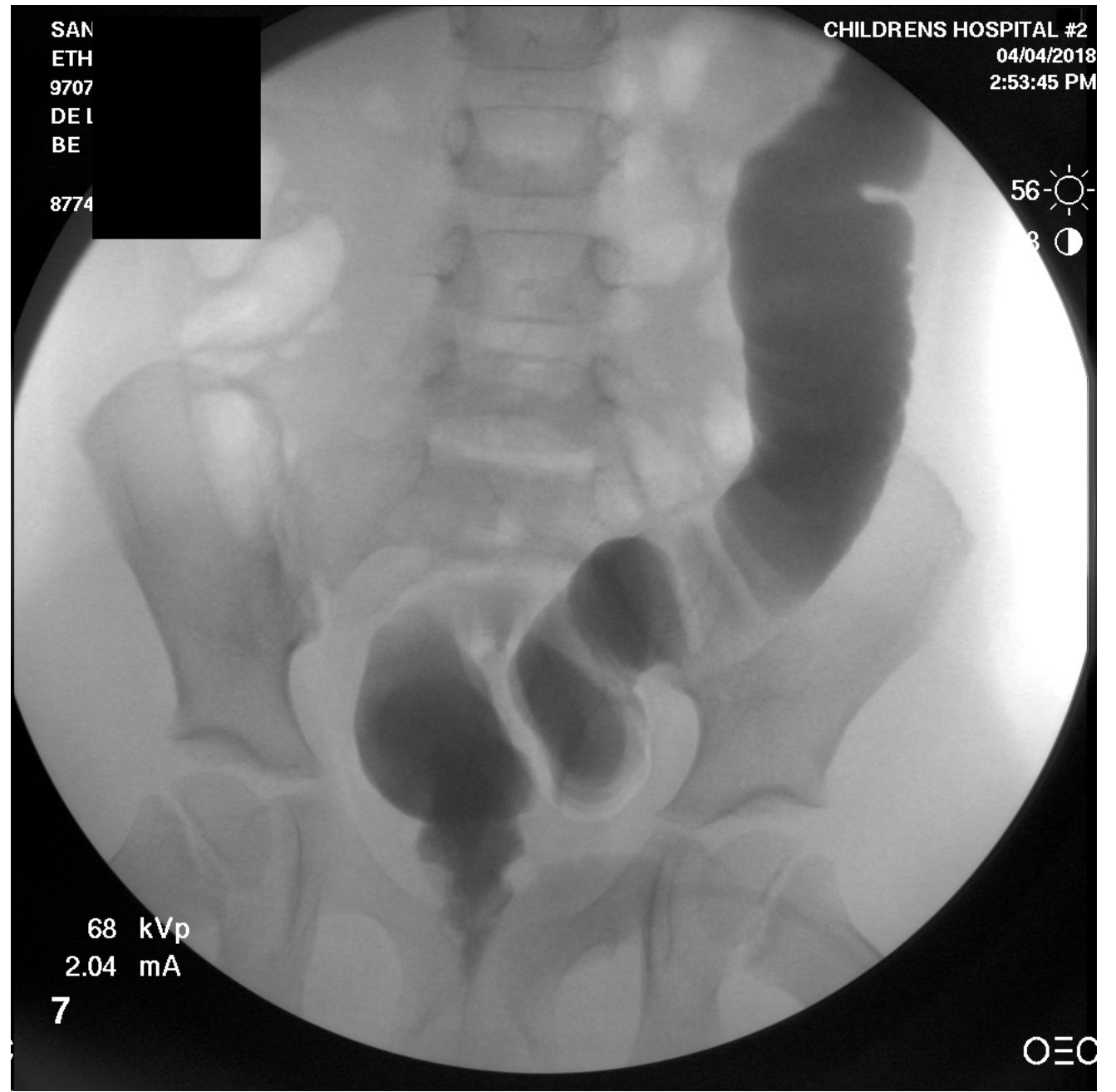


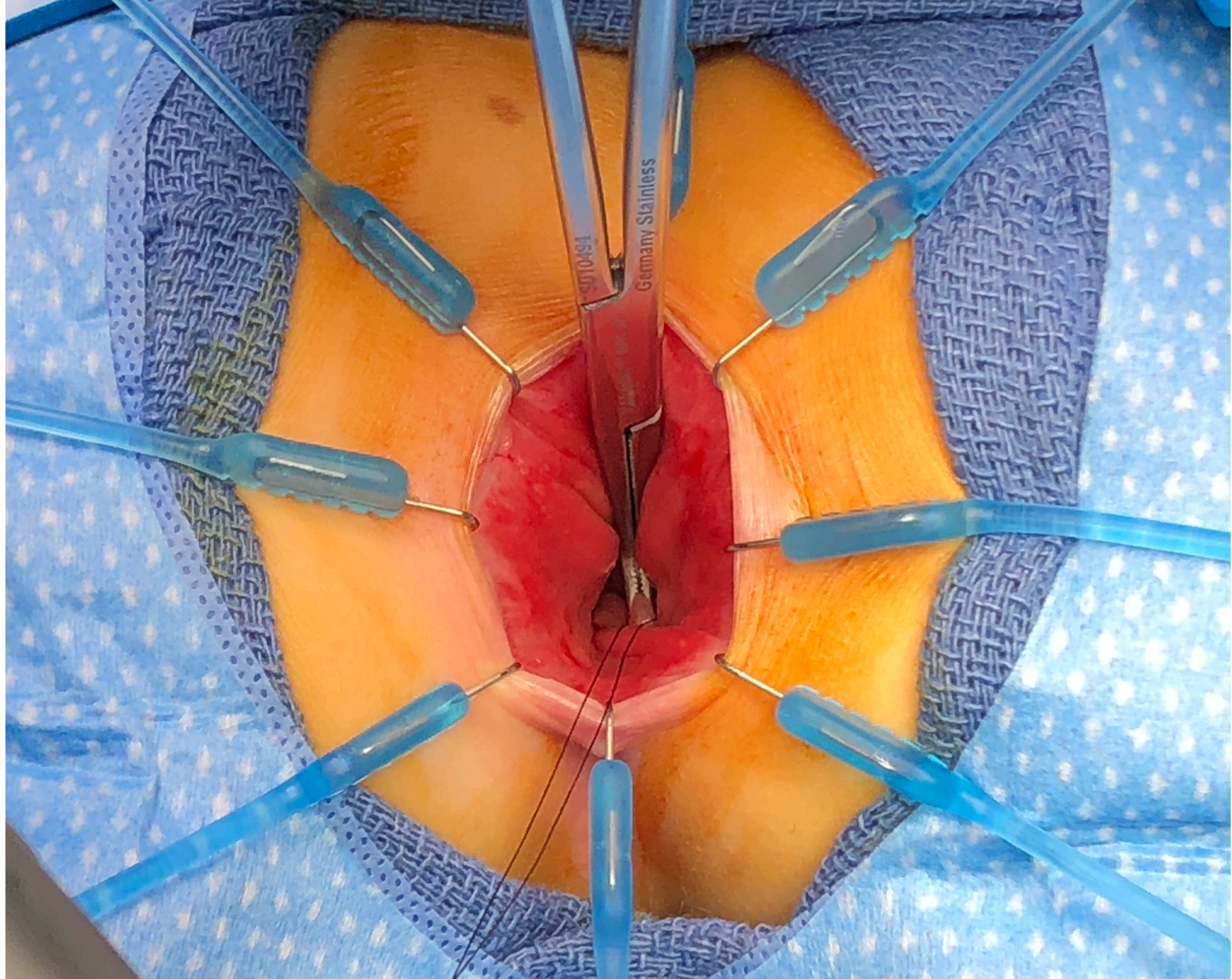
Children's
Hospital of Pittsburgh | of
UPMC







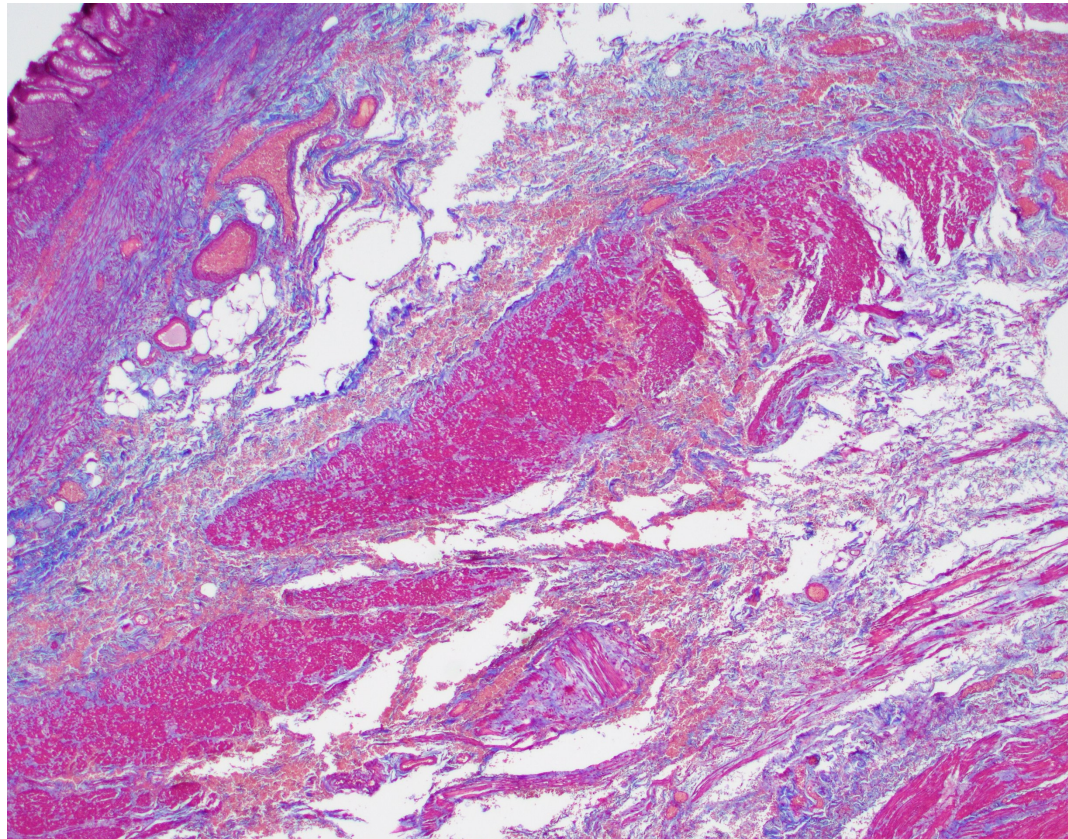




Patient population with chronic
complicated constipation /
megarectum

INCREASING POPULATION

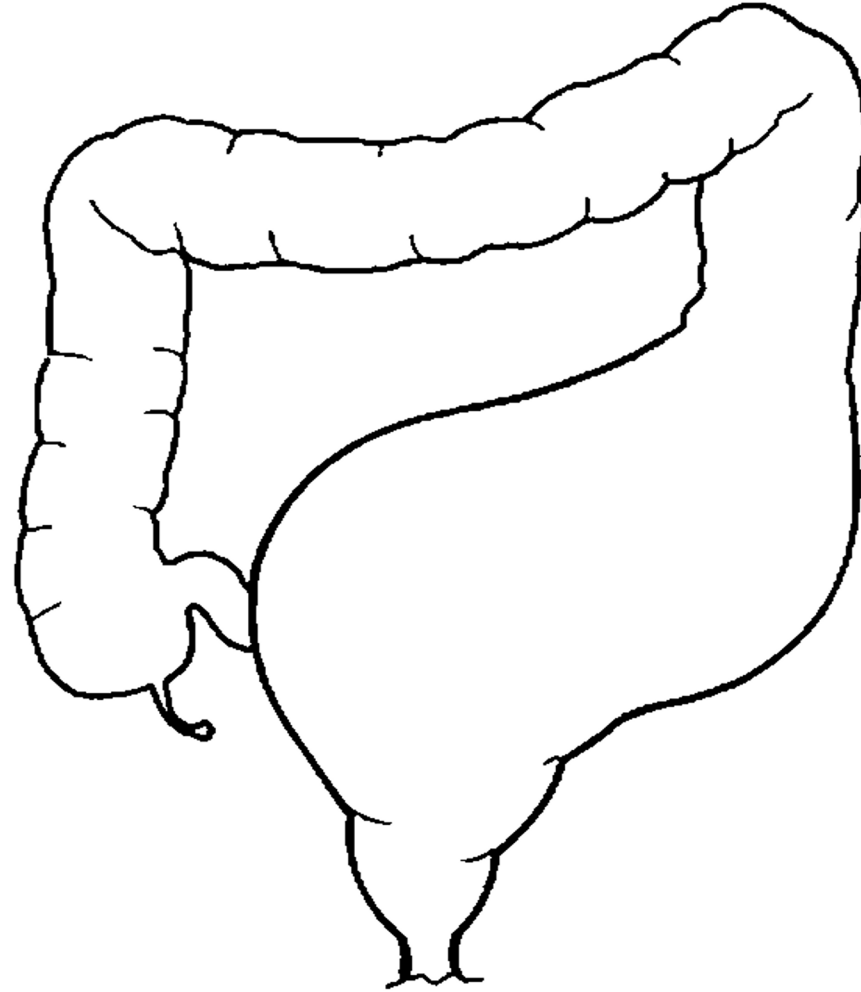
**The distal part of the megarectosigmoid
is the most affected area with increasing
fibrosis in the muscular layers**



The partial resection of the
enlarged and dysmotile
megarectosigmoid **reduces its
capacity of storage**

By providing a partial proctectomy
a small rectal pouch which avoids
the risk of fecal incontinence
(diarrhea) and fecal impaction (?)

Surgical options for megarectum and megasigmoid

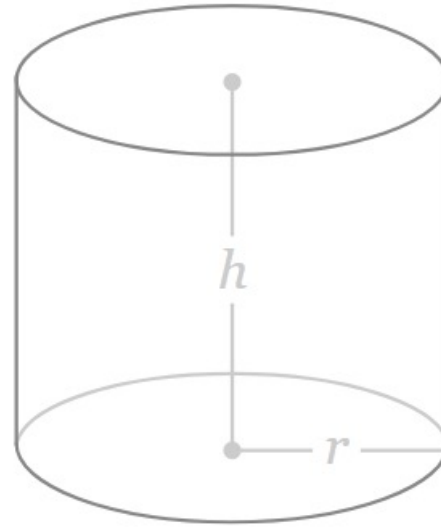


Source

$$V = \pi r^2 h$$

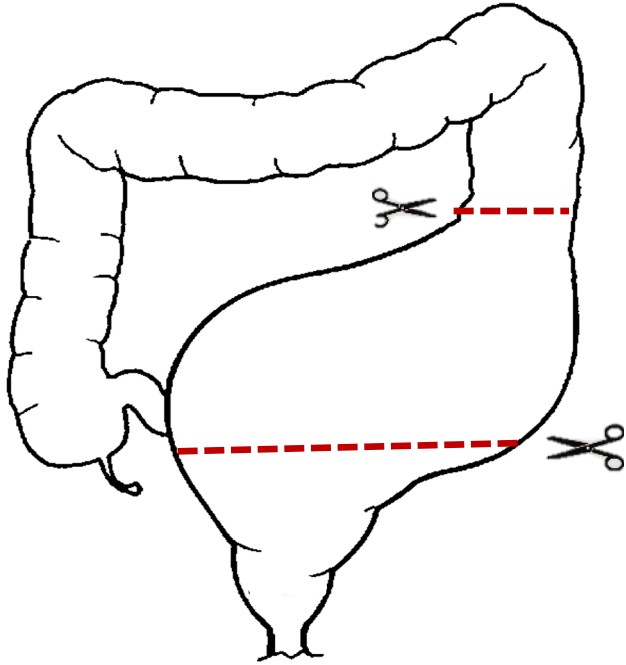
r Radius

h Height



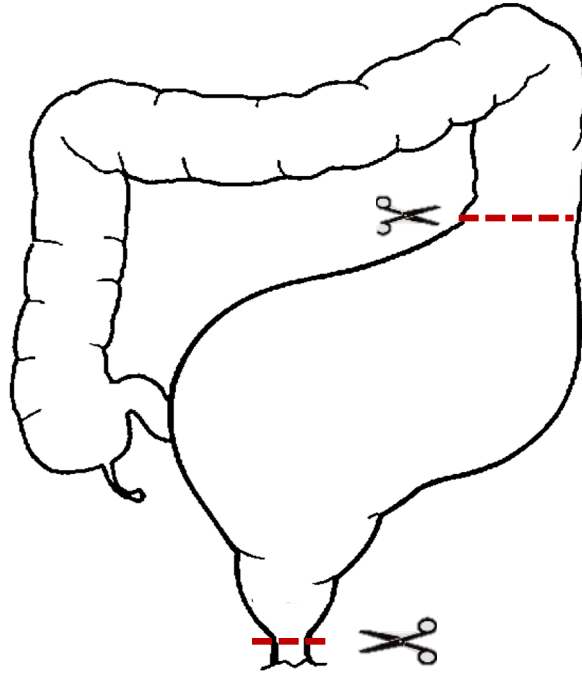
Surgical options for megarectum and megasigmoid

Abdominal Approach

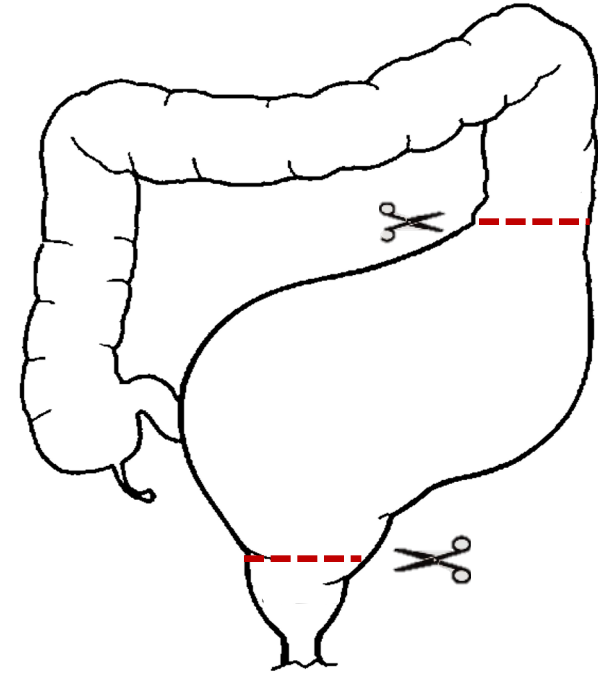


Sigmoidectomy
Appendicostomy

Transanal Approach

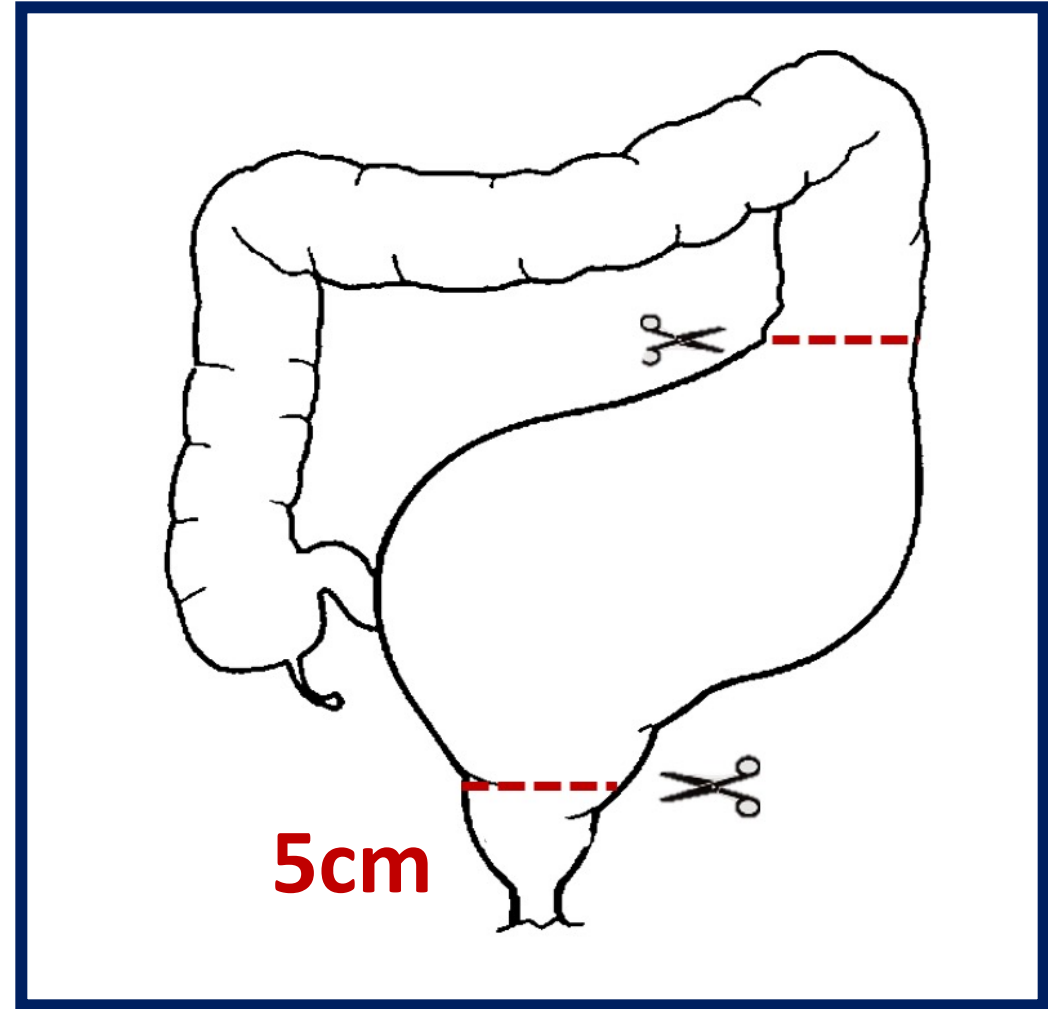
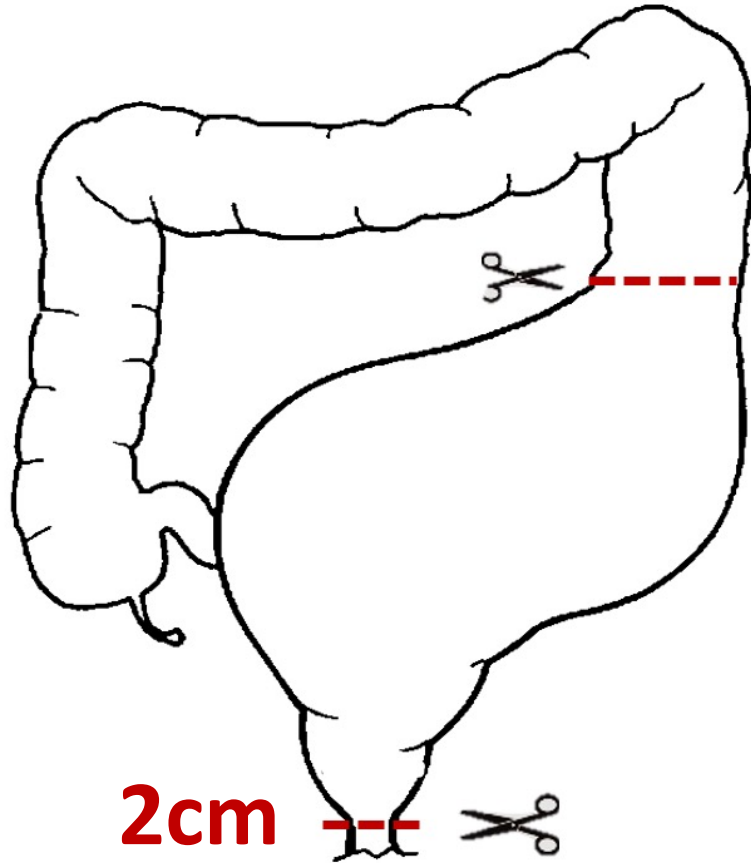


Resection
Rectosigmoid



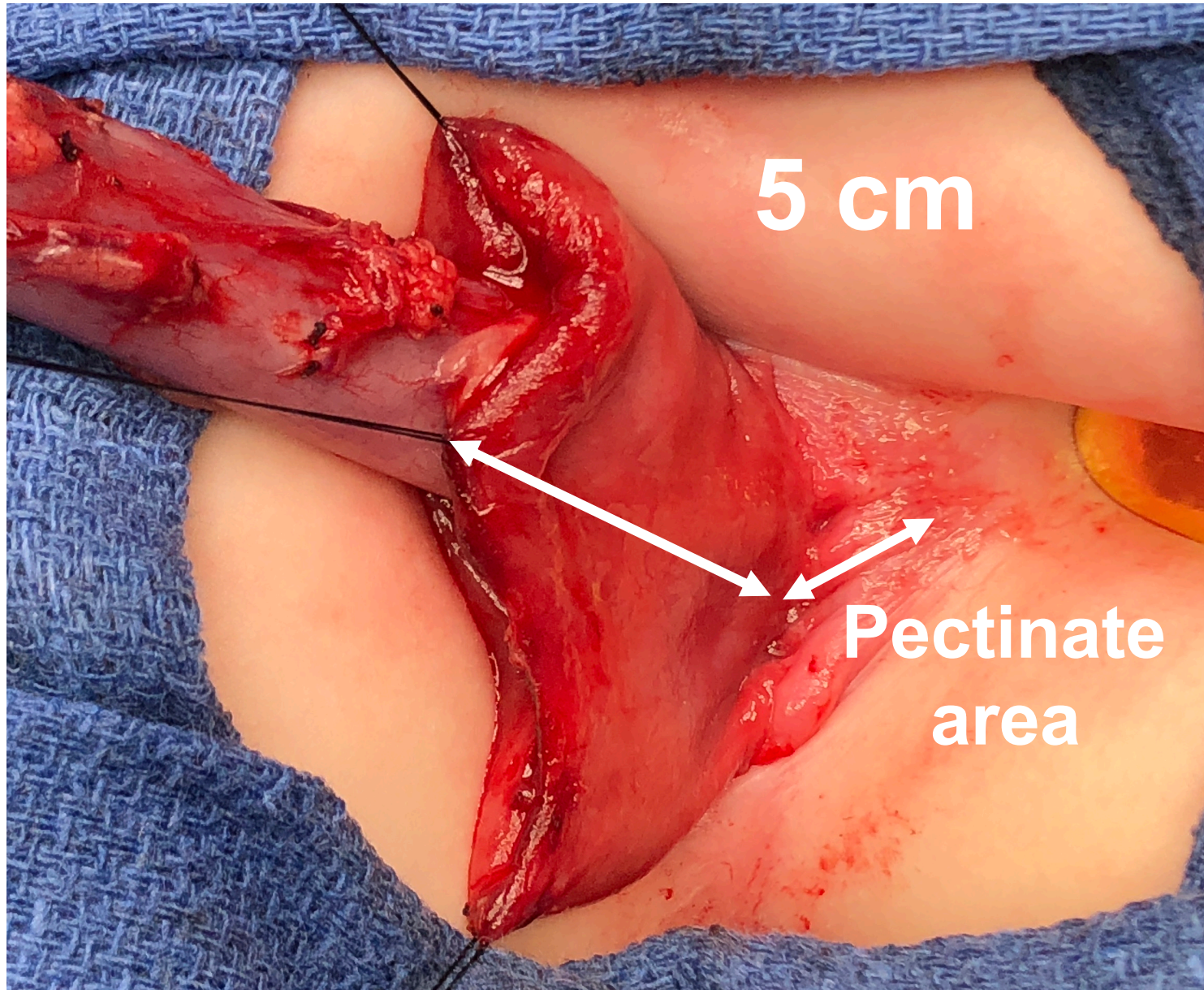
Proximal
Rectosigmoidectomy

Transanal Approaches



XXX

	Patient							
	1	2	3	4	5	6	7	8
Gender [f / m]	F	F	F	M	M	M	M	M
Age at onset of constipation								
Duration of constipation [y]	N/A	9	8	11	N/A	N/A	N/A	18y
Age at surgery [y]	12	11	8	18	6	4	3	19
Follow up time [m]	9	2	1	2.5	1	1	5	1
Behavioral Issues				Depression				Autism spectrum disorder, Anxiety Disorder
Treatment preoperative	150mg	525mg	150mg	1 cap Miralax	150mg	75mg	Enema	Enema
Treatment postoperative	60mg	75mg	75mg	51.6mg	75mg	15mg	Enema	Enema
Current treatment	30mg	75mg	60mg	51.6mg	30mg	15mg	Enema	Enema



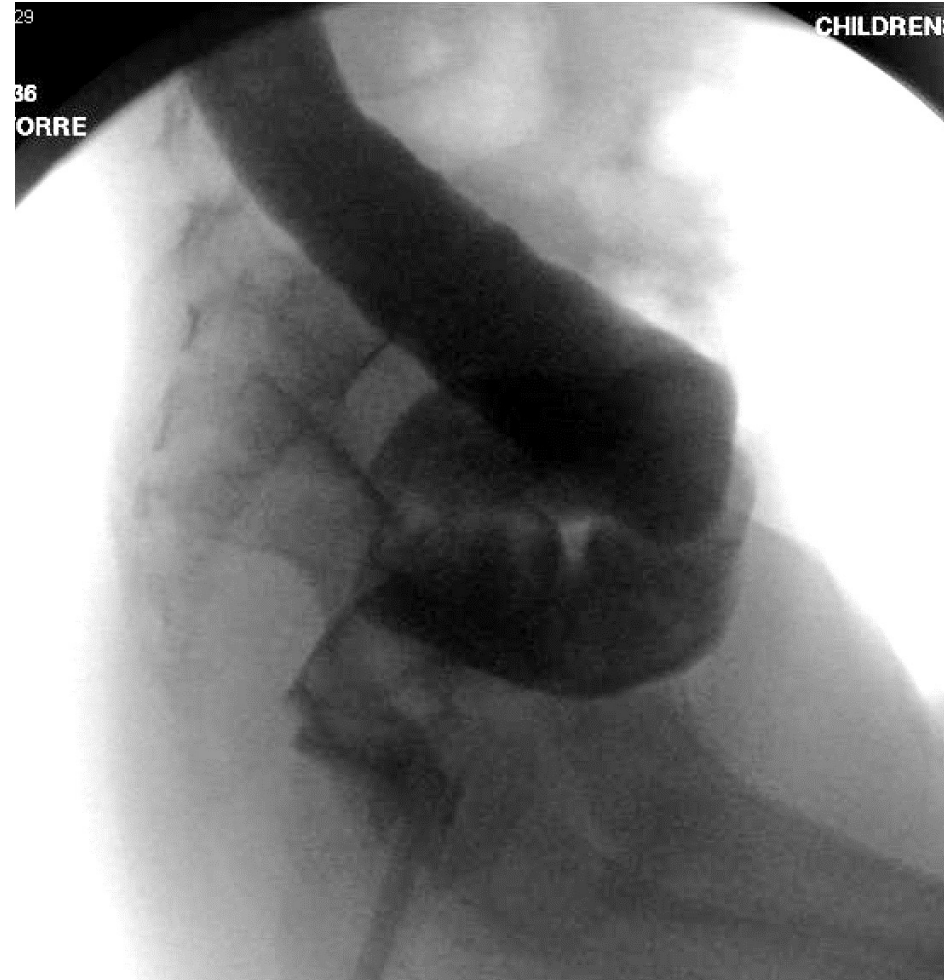
5 cm

Pectinate
area

Preoperative




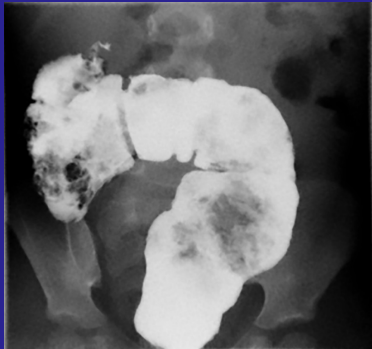


Postoperative



Transanal Proximal Rectosigmoidectomy

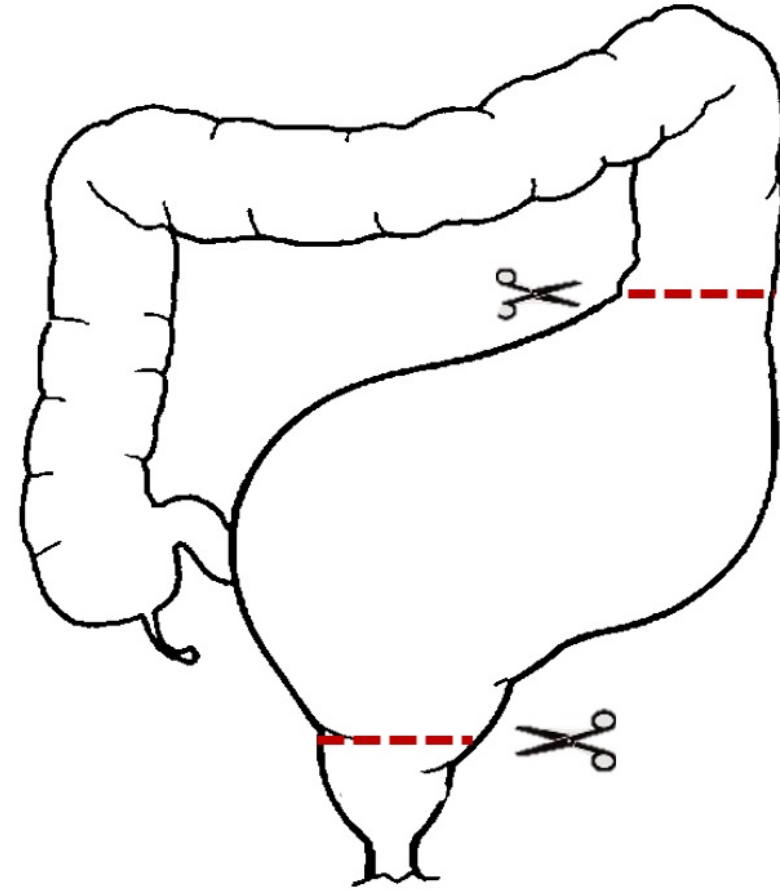
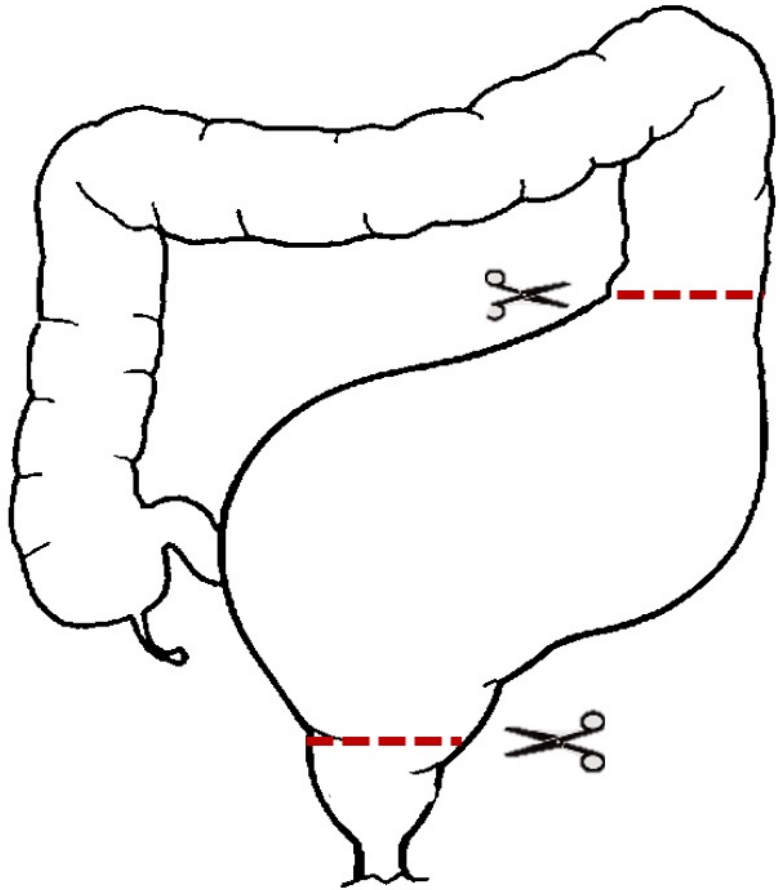
	Duration	Rectum	Resection Length	Preop Treatment	Postop	3 months	6 months
Duration of Constipation							
Resection Length	14.5 cm	7.5 cm		4cm			
Preop Treatment	36.8 cm	24 cm		5 cm			
Laxative postop	Chronic	Stenosis of					
Contrast Enema Pre/Postop							
	70% of remaining	Normal		Normal			
Diagnosis after workup	Stenosis of the anastomosis	Stricture of PT					

	Patient 1	Patient 2	Patient 3	Patient 4
Type of pull-through	Primary laparoscopic endorectal PT (4 days)	Two-stage Open Endorectal PT (7 months) Posterior myectomy (14 months)	Primary Laparoscopic Endorectal PT (8 days)	Two-stage open full-thickness PT (3 months)
Length of aganglionosis	11.5 cm	14 cm	11cm	7.5 cm
Length of colectomy	41.5 cm	18 cm?	40 cm	24 cm?
Referral diagnosis	Chronic diarrhea	Chronic diarrhea	Constipation	Stenosis of PT

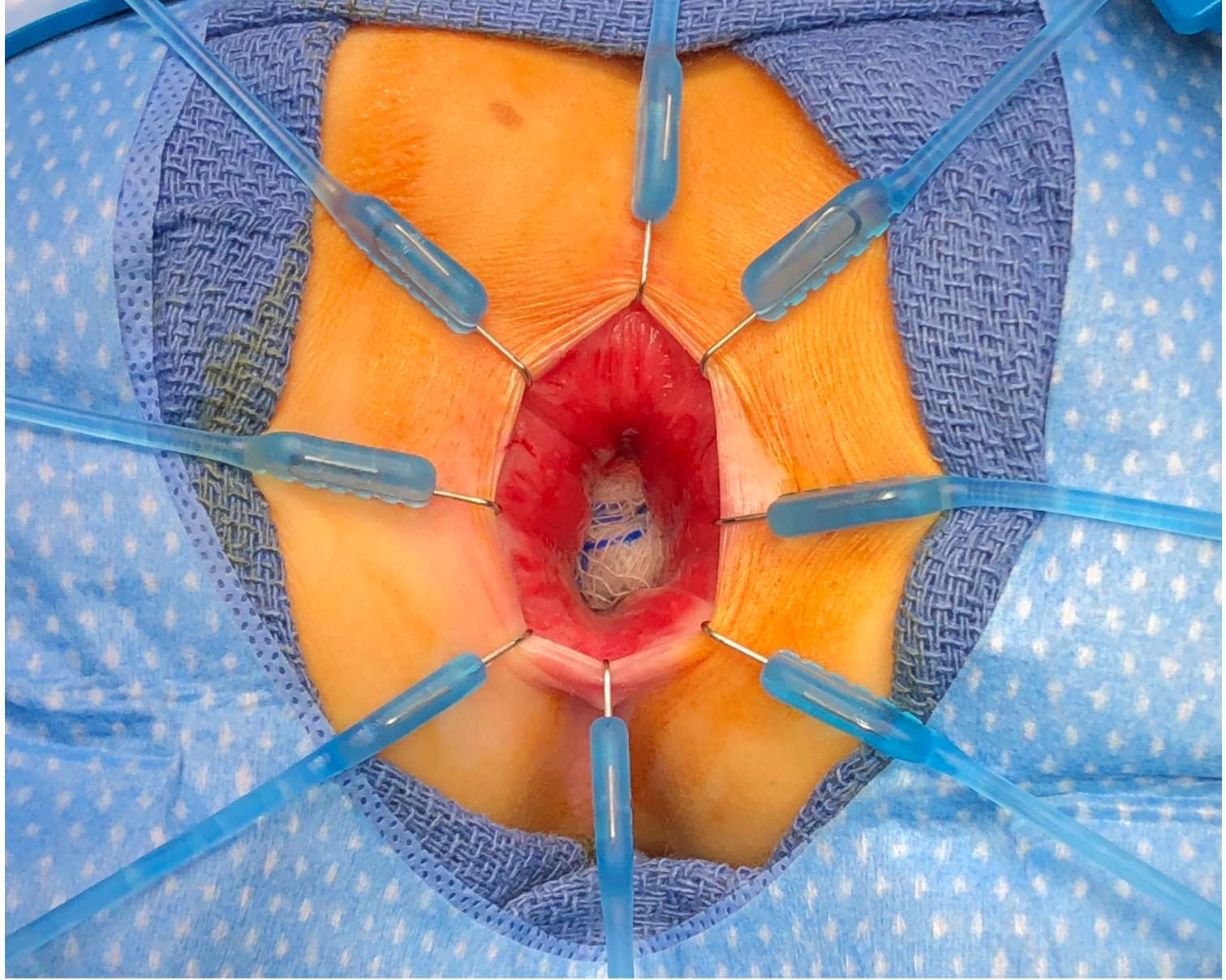
Remaining colon in the contrast enema				
Anal canal	50% of remaining pectinate line	70% of remaining pectinate line	Normal	Normal
Diagnosis after workup	Stenosis of the anastomosis	Stenosis of the anus	Constipation	Ischemic PT
Re-operation	Transanal Full-thickness	No	No	Abdomino-perineal Full-thickness
Outcome	Fecal incontinence	Fecal incontinence	Fecal continence	Ileostomy

Summary

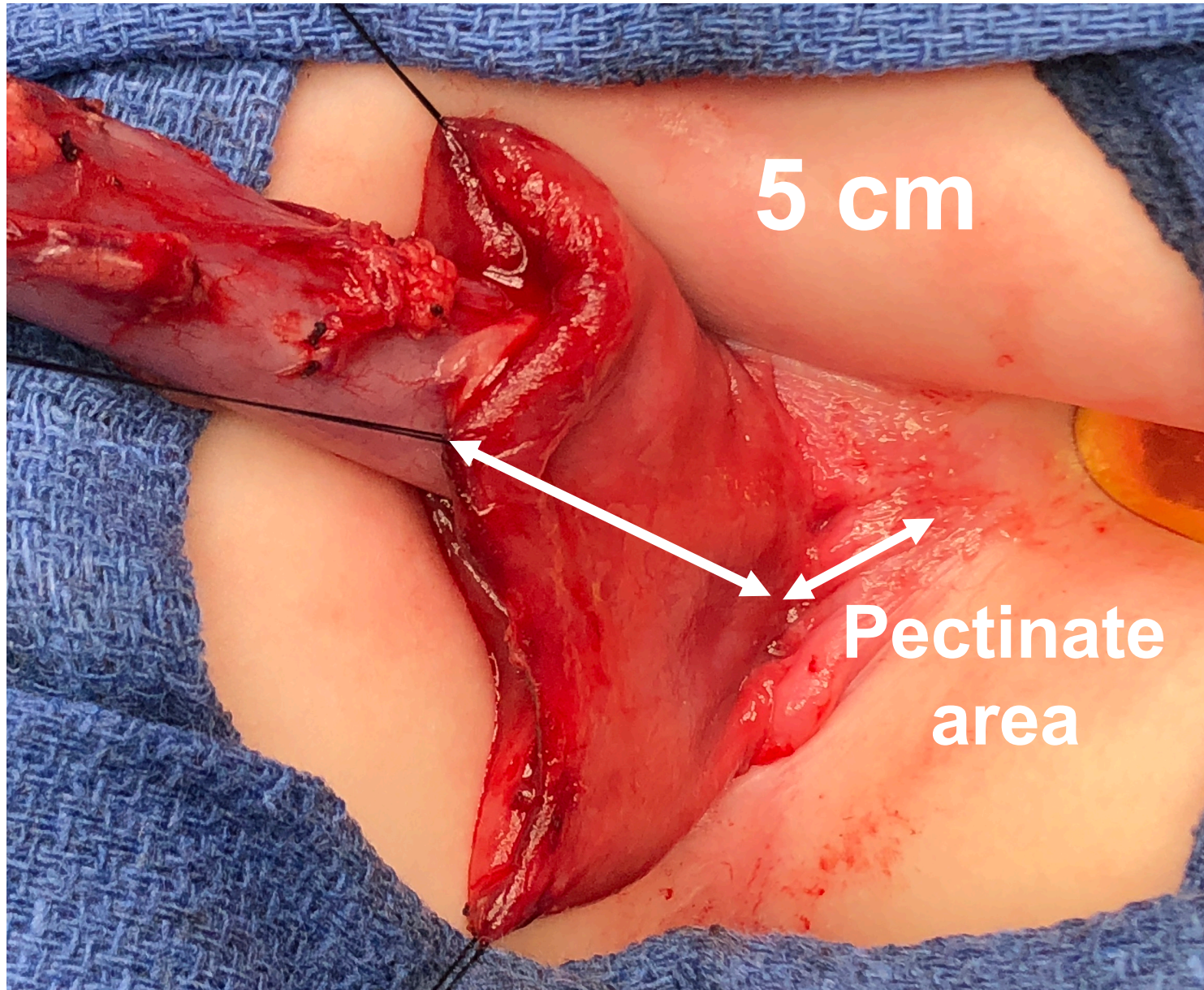
Results



- Chronic complicated constipation is an often underestimated trivialized disease
- If medical treatment fails, surgical options are needed
- Failure of medical treatment needs to be defined
- Indication if chronic / duration?
- Treatment of the symptom, no of the cause

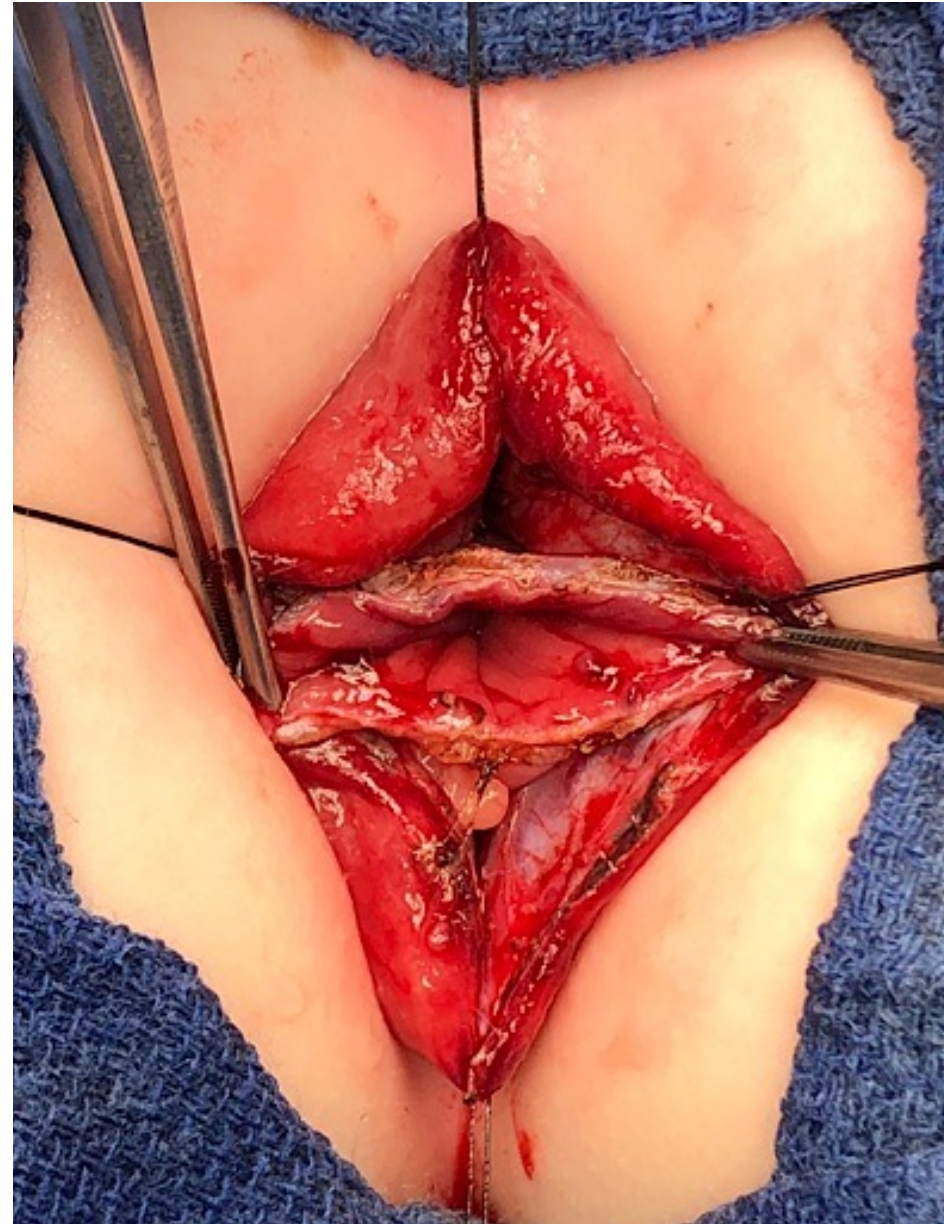


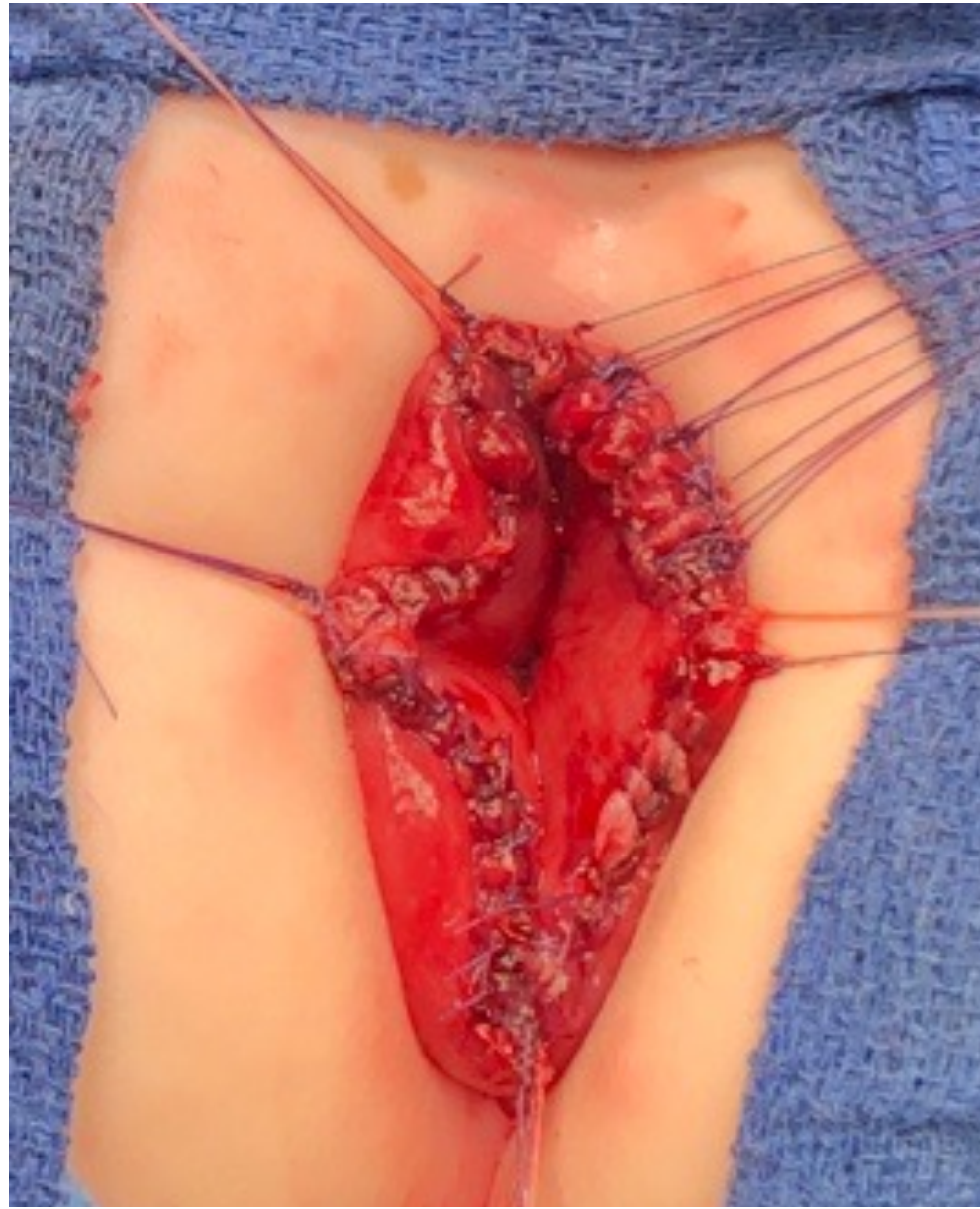




5 cm

Pectinate
area



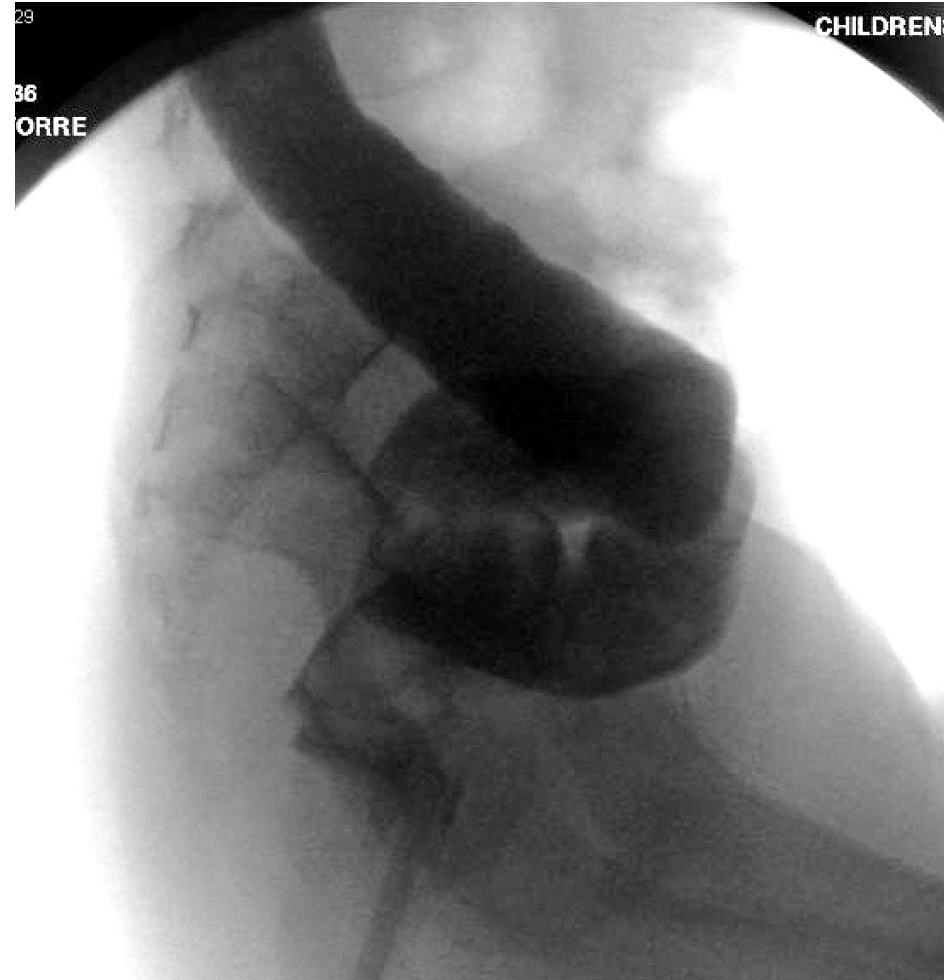


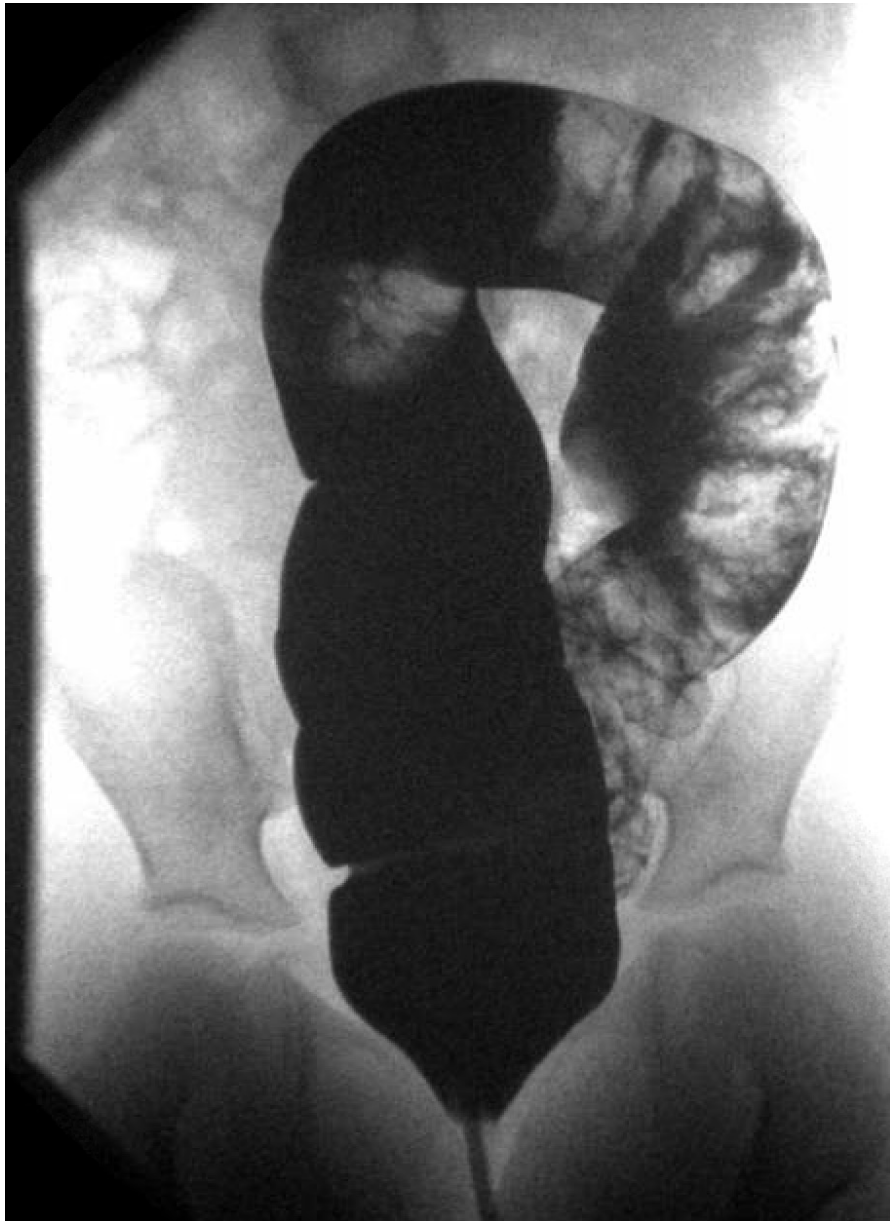


Preoperative

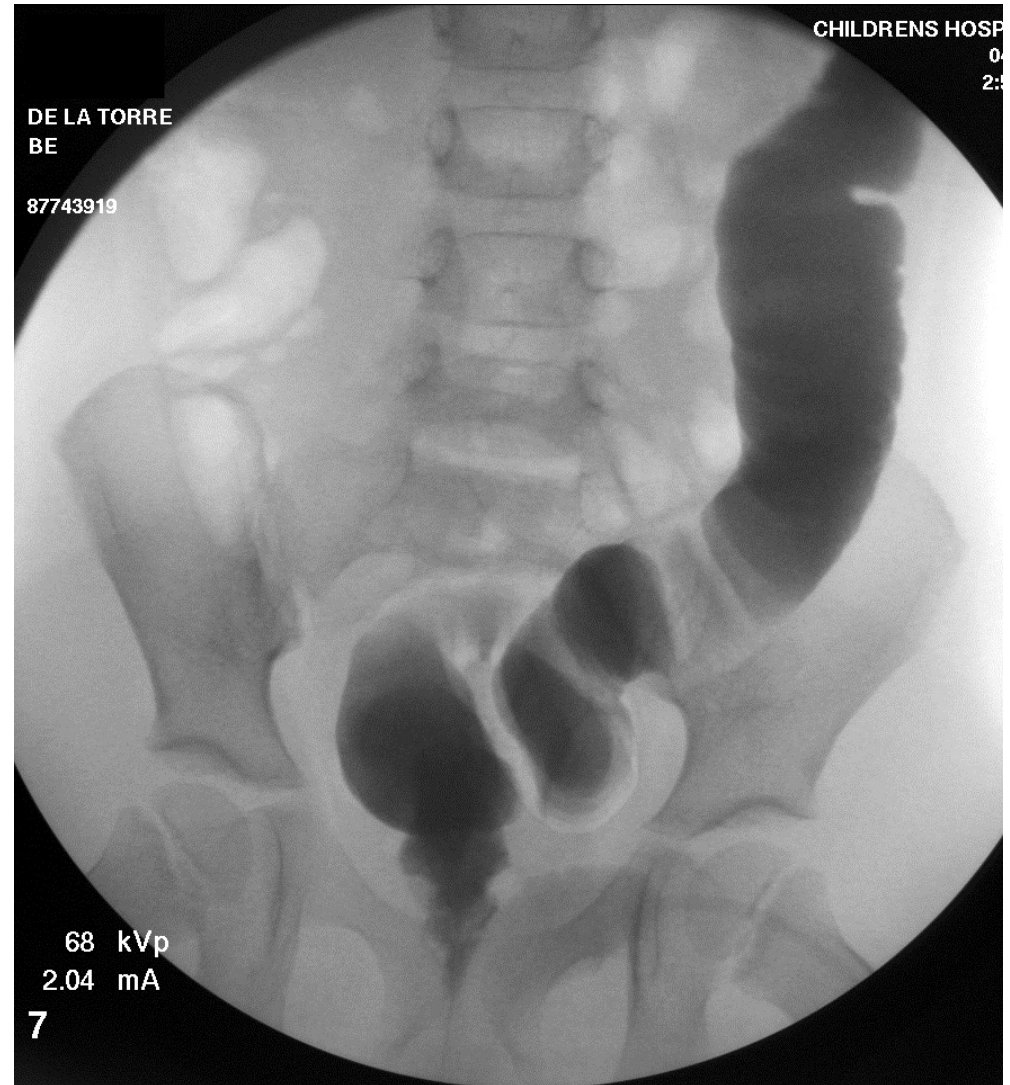


Postoperative



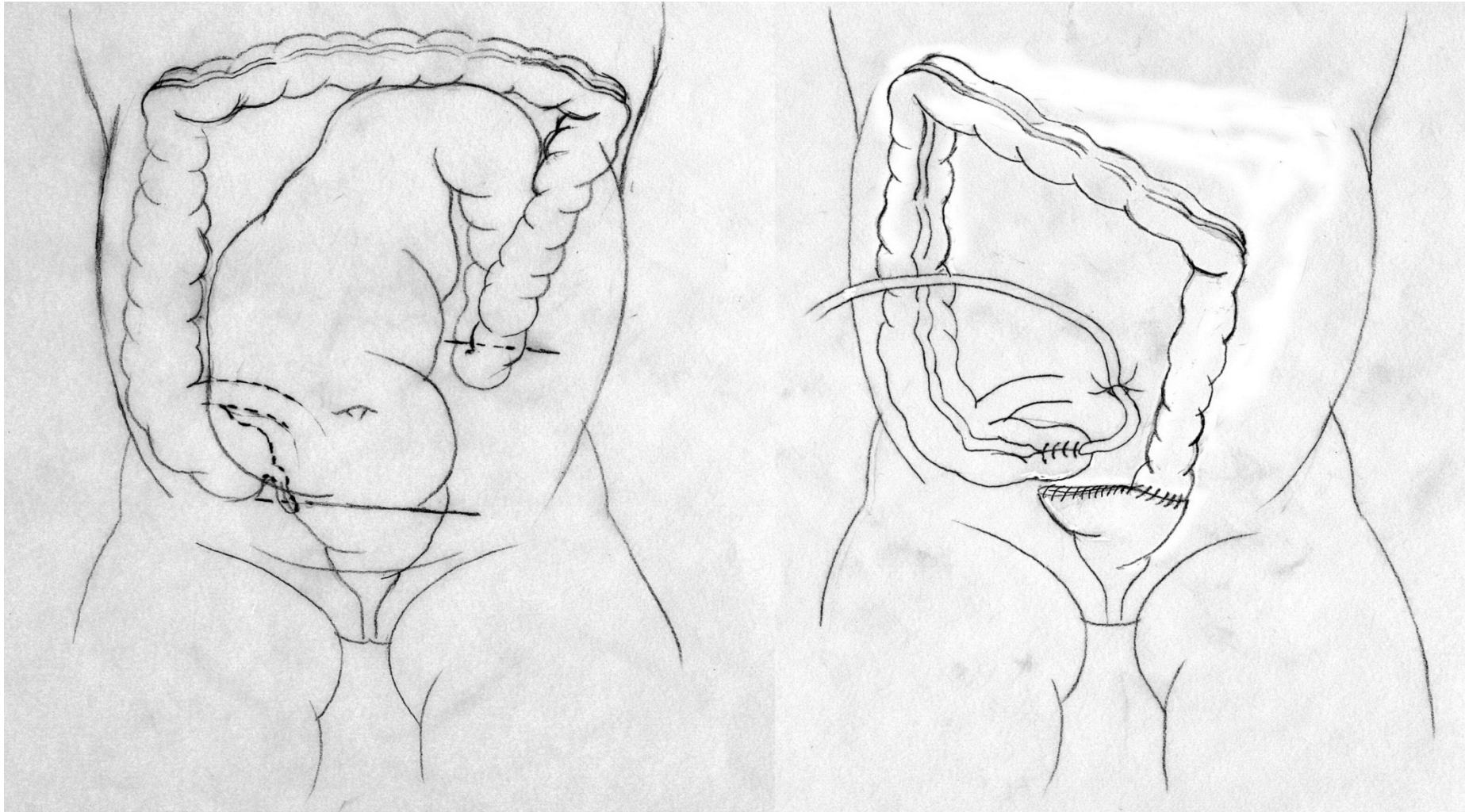


Preoperative



Postoperative

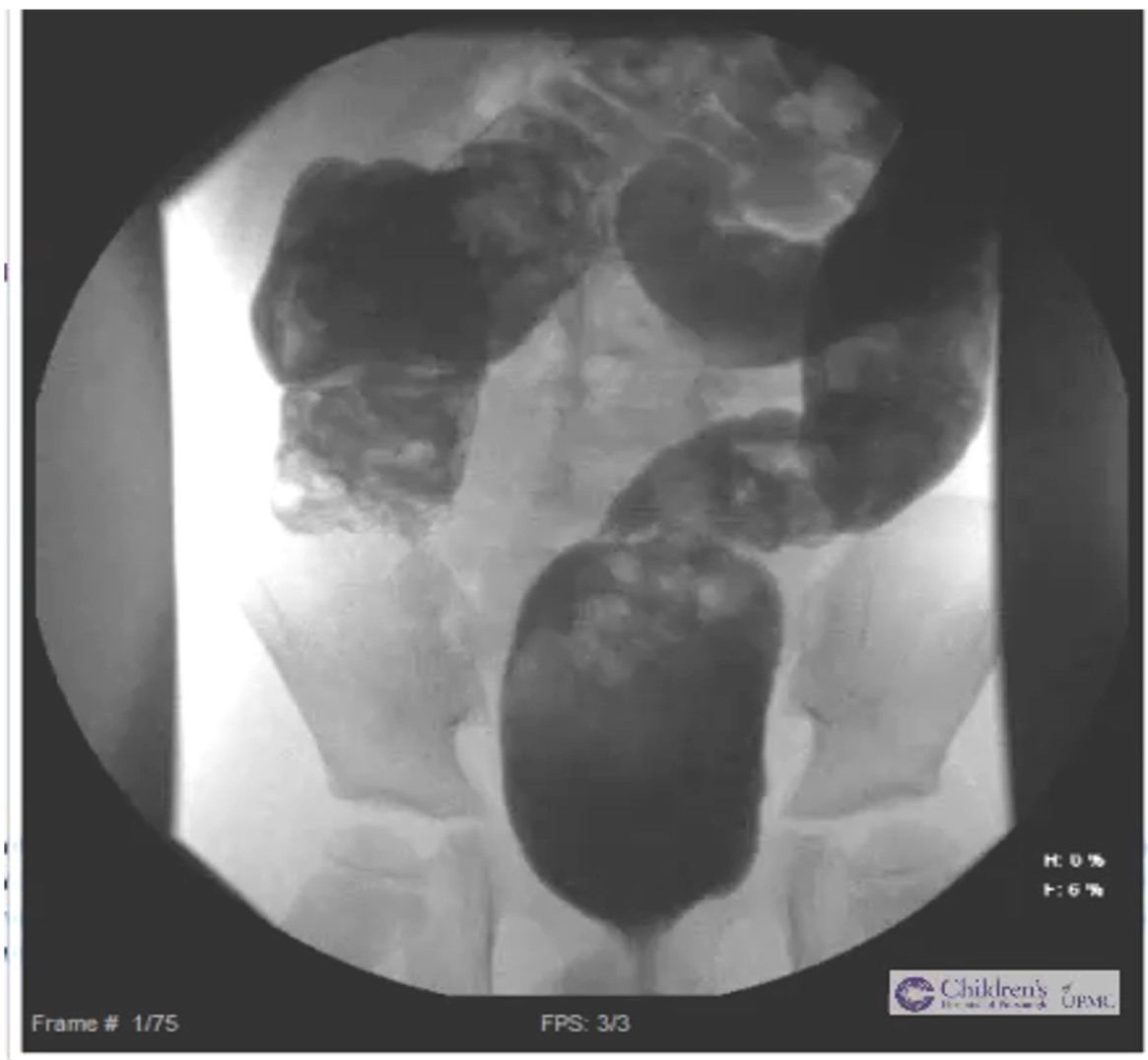
Appendicostomy and Sigmoidectomy





Primary sigmoidectomy and appendicostomy for chronic idiopathic constipation

Luis De la Torre MD, Kimberly Cogley MSB, Juan Calisto MD, Gary Nace MD and Catalina Correa MD
Colorectal Center for Children



Frame # 1/75

FPS: 3/3

H: 0 %
I: 6 %

Children's
Hospital of Pittsburgh
UPMC

primary sigmoidectomy and appendicostomy for chronic idiopathic constipation

Purpose.

To present our experience in patients with chronic idiopathic constipation complicated by megarectosigmoid and fecal incontinence who underwent a primary sigmoidectomy and appendicostomy.

Methods

November 2013 and April 2016,

214 patients with CIC + persistent fecal impaction + fecal incontinence.

8 of 214 patients underwent a sigmoidectomy and appendicostomy.

- previous medical treatments

- indications for the surgical procedure

- outcomes.

Institutional Review Board (PRO 15030254).

Methods

Laparoscopic assisted technique

dissection of the left and right gutters, cecum, appendix and mesentery of the megasigmoid to the level of the peritoneal reflection and 5cm of the normal-caliber proximal colon.

A low Pfannenstiel incision

An end-to-end 2-layer anastomosis was performed between the non-dilated proximal colon and the left side of the dilated rectum.

The remaining rectal stump was sutured in two layers.

Creation a continent appendicostomy, performing a cecal plication around the native appendix or partial invagination of the appendix at the base with four equally spaced stitches of 5-0 silk.

A “V” incision was made in the umbilicus and a skin flap was created.

The fascia was opened widely to allow the appendix to pass easily.

The appendix is anastomosed to the right arm of the V-shaped incision.

The open technique was performed through a low Pfannenstiel incision

Methods

Laparoscopic assisted technique: 3 ports and a low Pfannenstiel incision
Obese, adolescents.

Open technique: a low Pfannenstiel incision
No obese and small children

Sigmoidectomy: hand-sewn colo-rectal anastomosis

Continent appendicostomy

- cecal plication around the native appendix
- partial invagination of the appendix at the base of the cecum

The appendix is anastomosed to the right arm of the **V-shaped incision**.

	Patient							
	1	2	3	4	5	6	7	8
Sex (male or female)	F	M	M	F	M	M	M	M
Age at onset of constipation	1	9	4	2	2	1	1	6
Years of constipation	4	5	15	12	10	8	6	6
Age at surgery	5	14	19	15	13	9	9	12

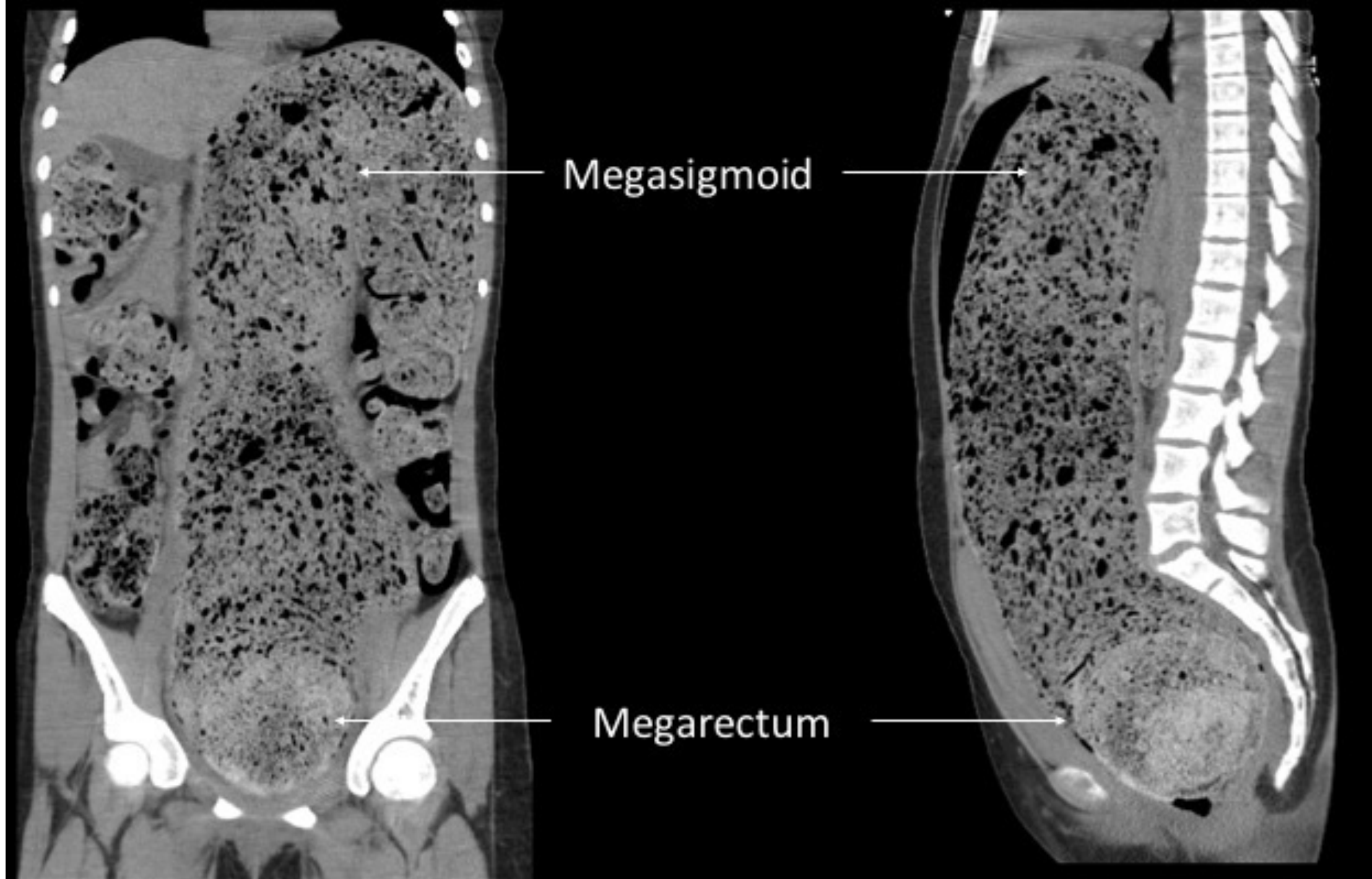
Laxatives tried (n)	3	5	2	1	5	4	3	2
Polyethylene glycol	+	+	+	+	+	+	+	+
Bisacodyl	+	+	+		+		+	+
Sennosides	+	+			+	+	+	
Docusate		+			+	+		
Milk of magnesia						+		
fiber					+			
Lubiprostone (Amitiza)		+						
Botox		+						
Clean-out / disimpaction	2	2	1	1	1	5	1	3

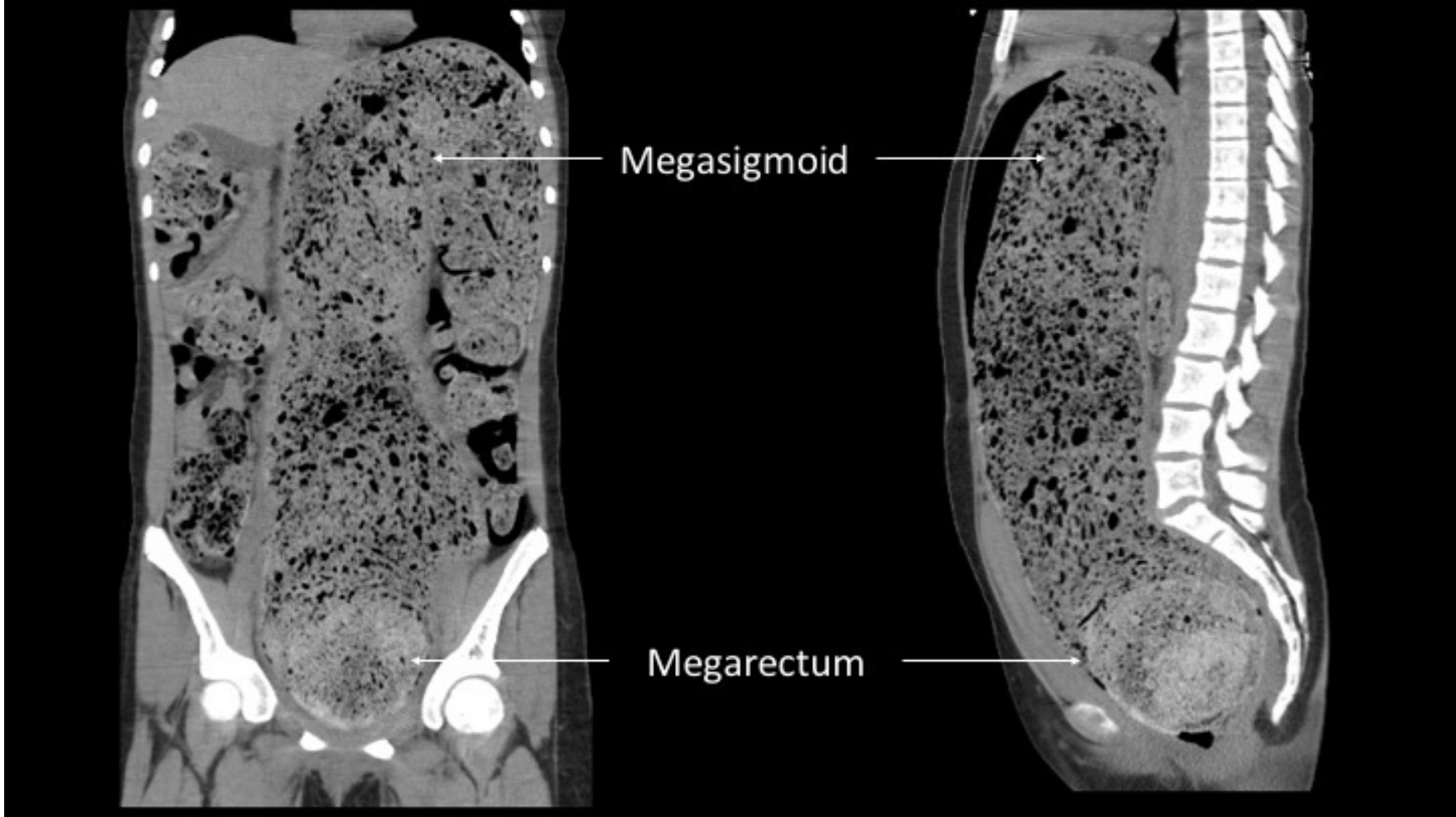
Successful bowel management with enemas	+	+	+	+	+	+	NA ^a	NA ^b
Ganglion cells in rectum	+	+	+	+	+	+	+	+
Contrast enema	yes	yes	yes	yes	yes	yes	yes	yes
Autism specter disorder	+	-	-	-	+	+	-	+
Laparoscopic-assisted	no	yes	yes	yes	yes	yes	no	yes

^a step father was accused for sexual abuse and family refused enemas

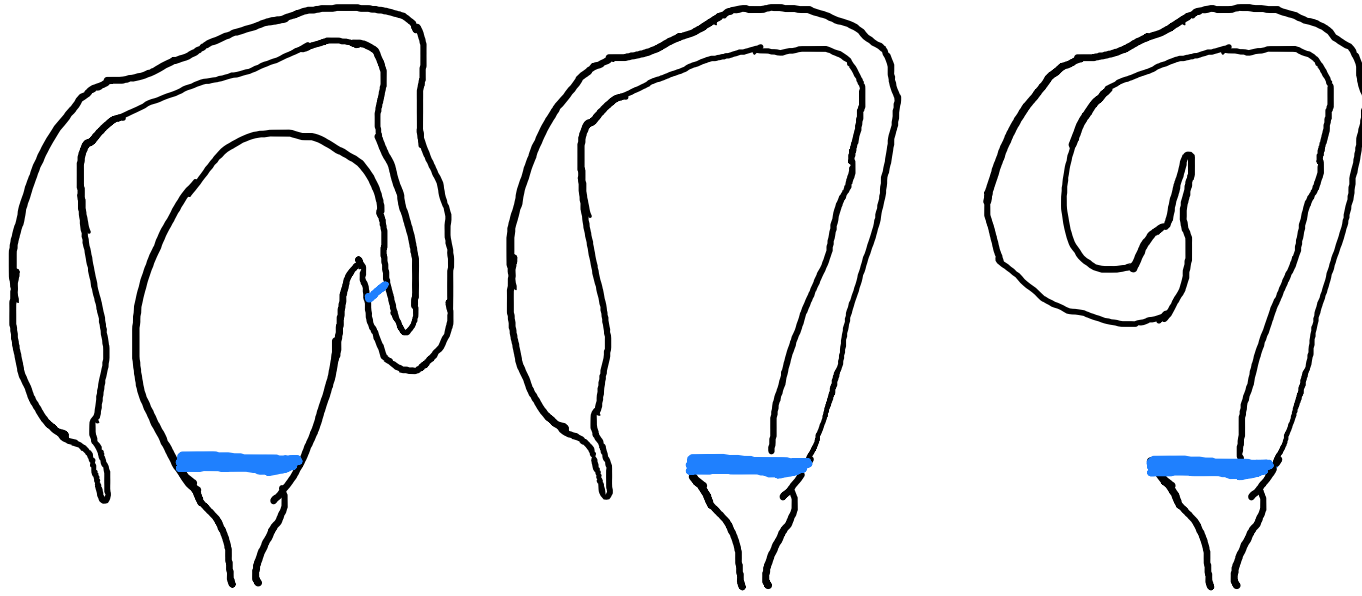
^b autism with considerable aggressive behavior and chronic recurrent fecal impaction

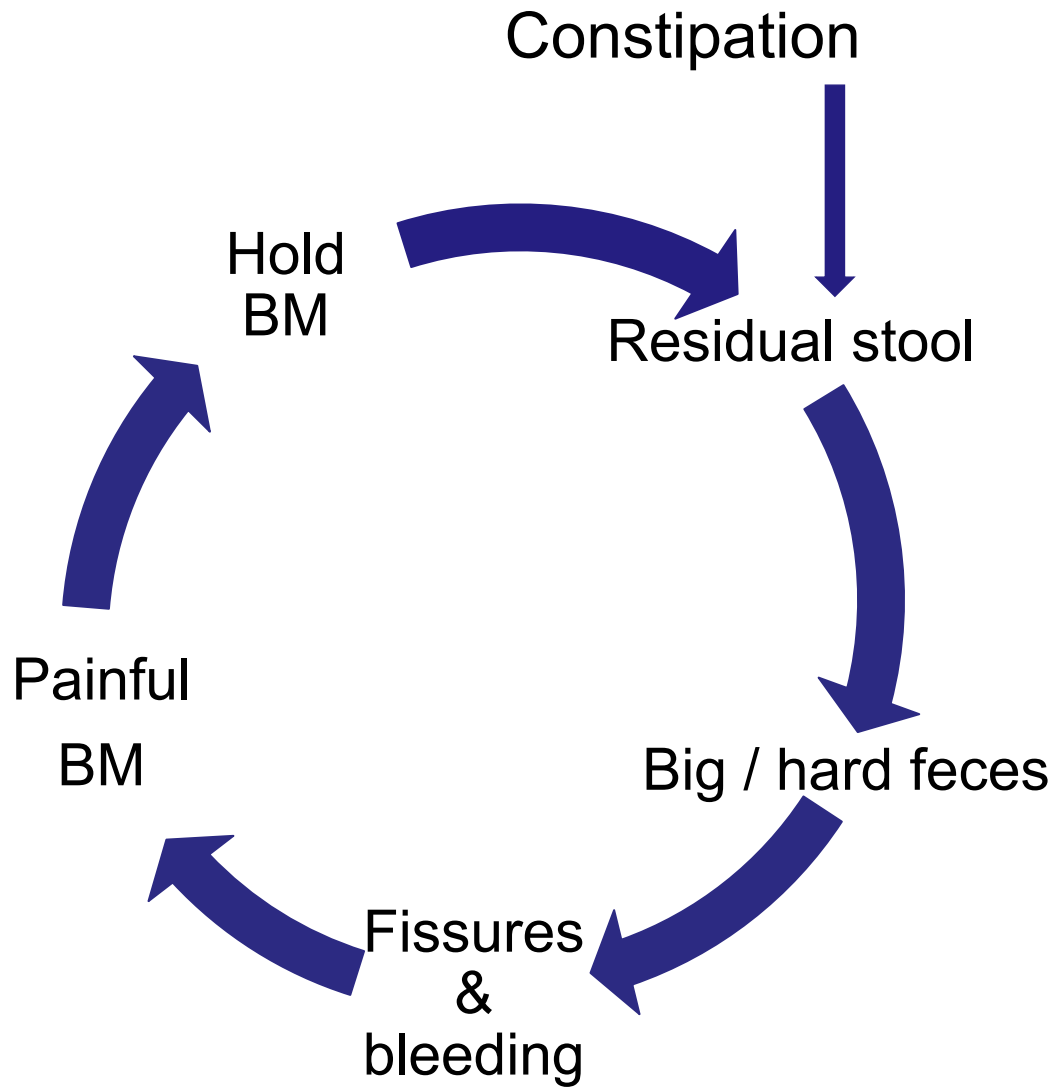
Patient	Medication for autism
1	Clonidine
5	Atomoxetine, Risperidone
6	Atomoxetine, Mirtazapine, Lamotrigine
8	Quetiapine, Guanfancine, Amphetamine/Dextroamphetamine

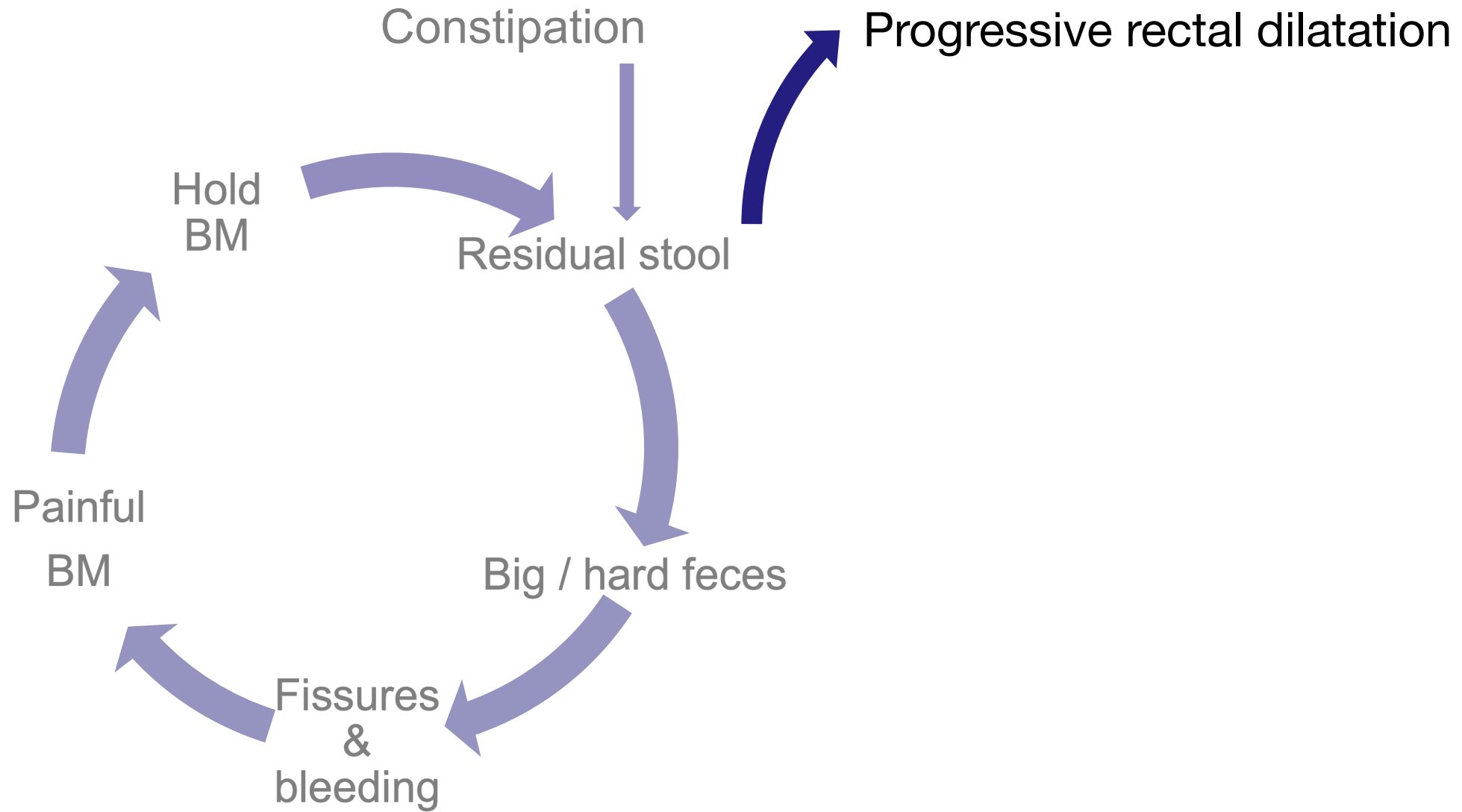


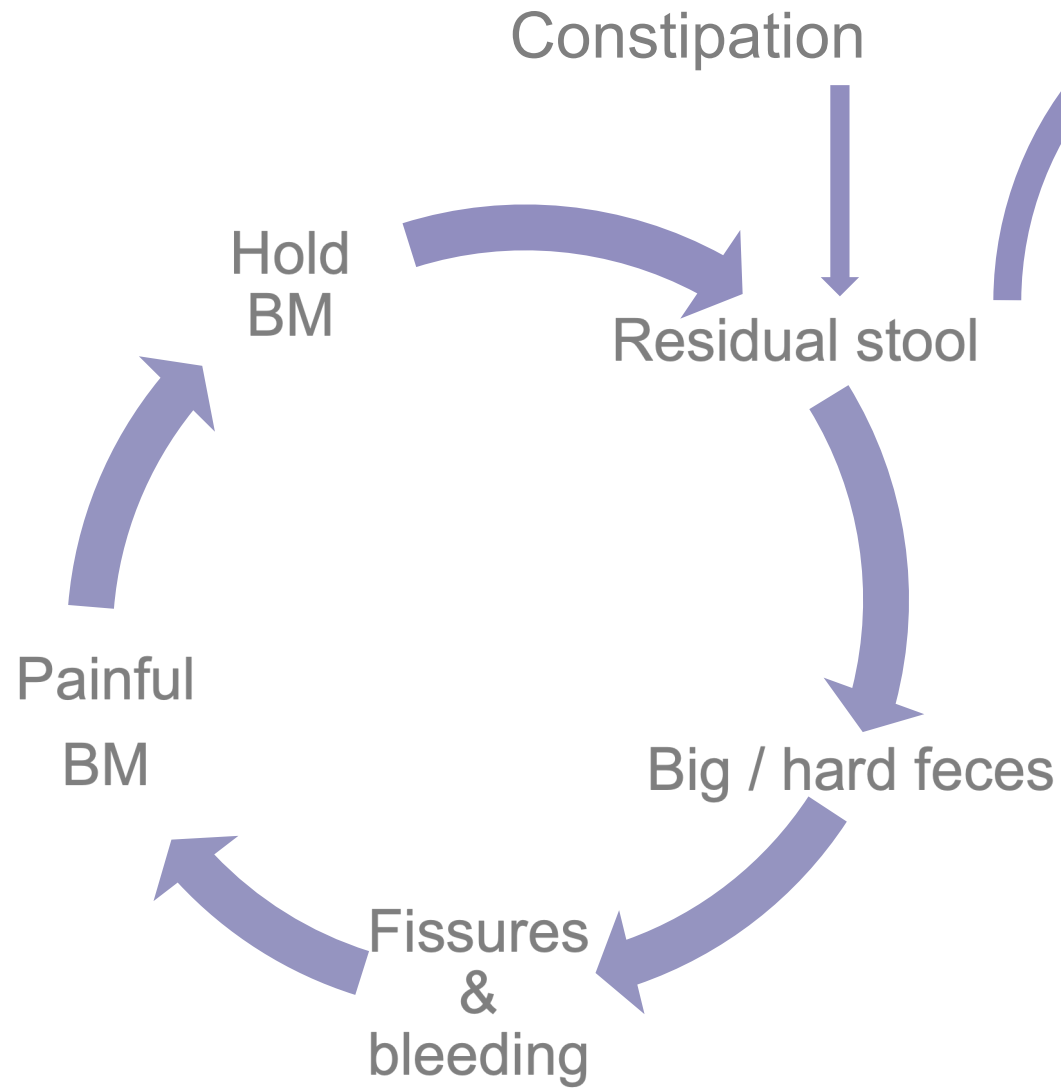


Primary sigmoidectomy and appendicostomy for chronic idiopathic constipation



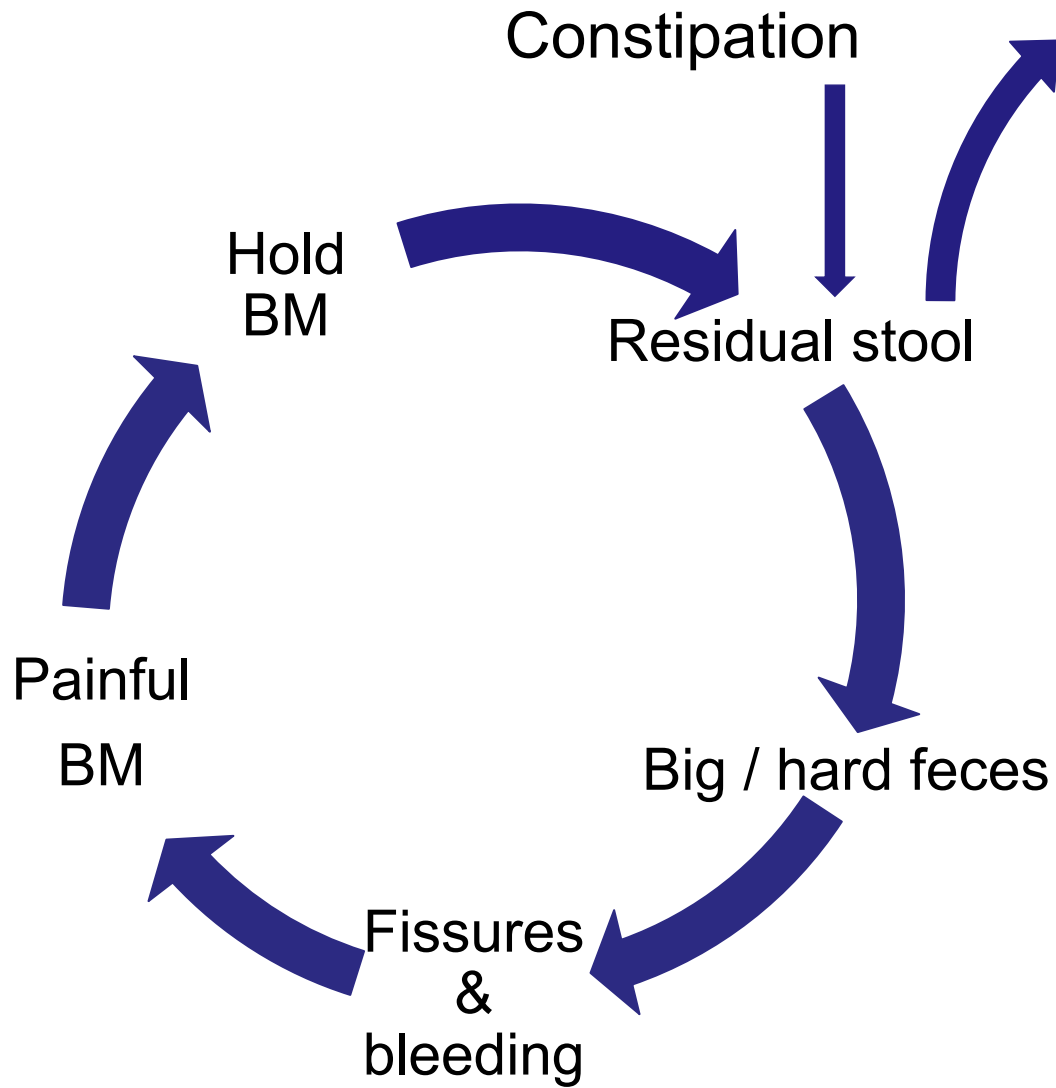






Progressive rectal dilatation

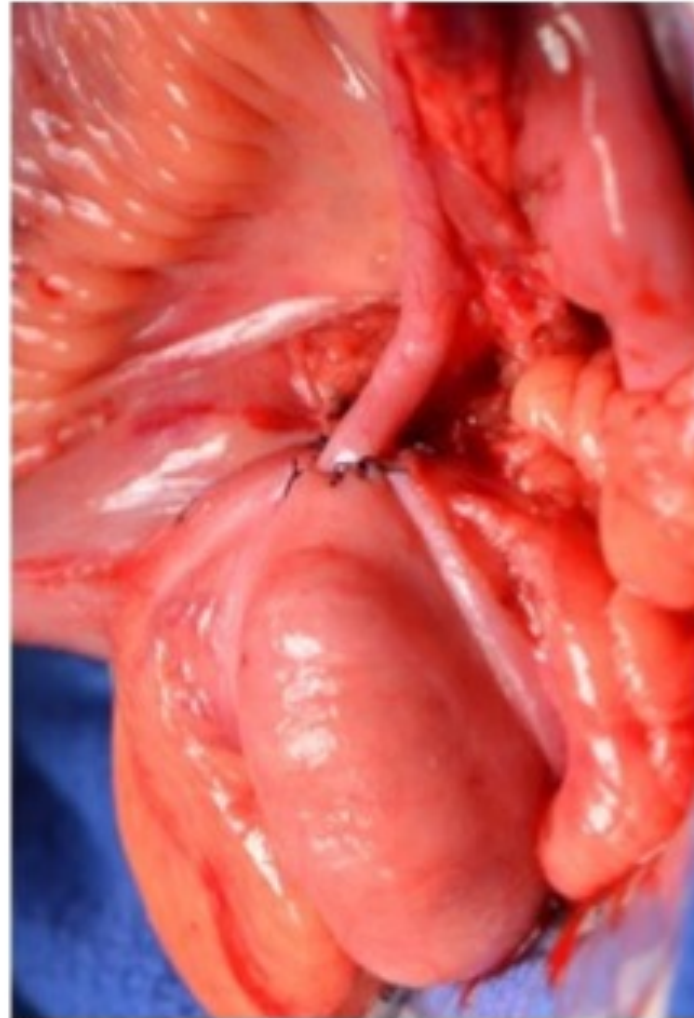
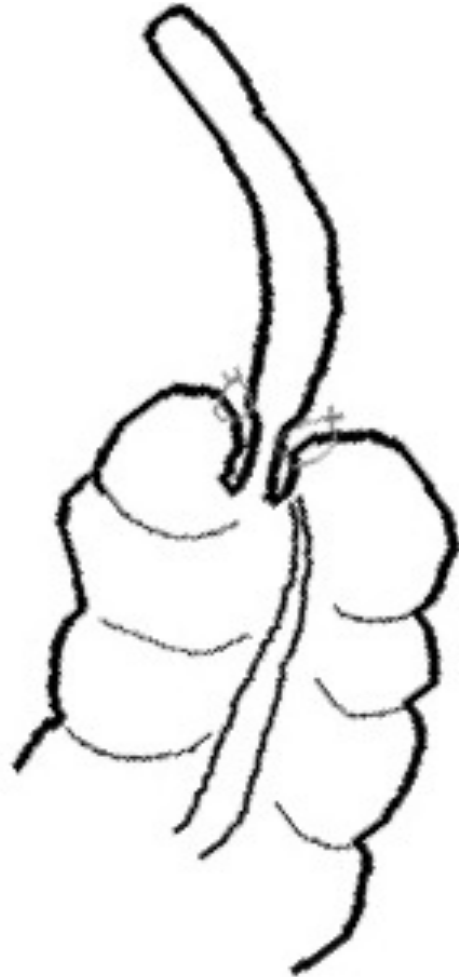
**Megarectum
and
Megasigmoid**



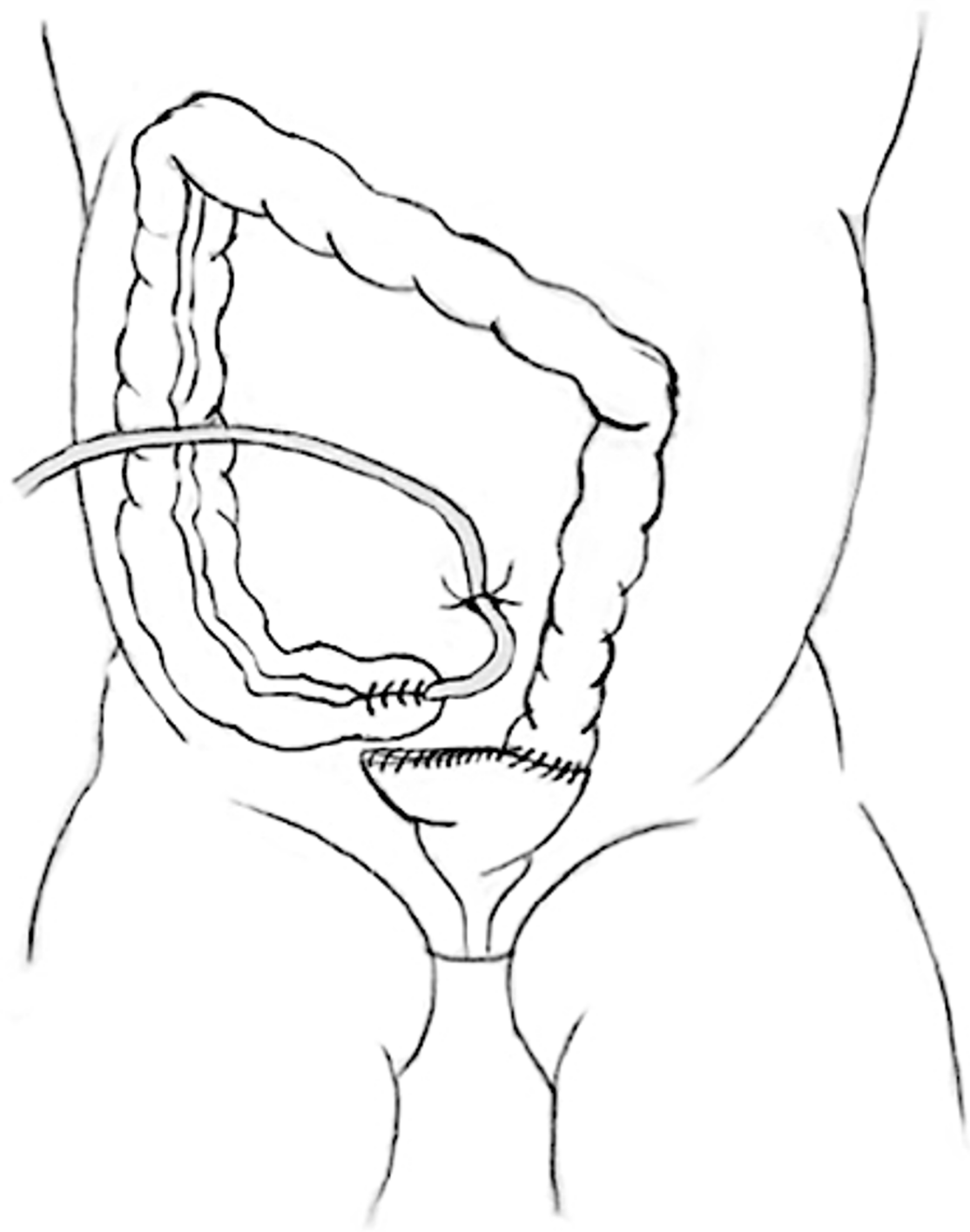
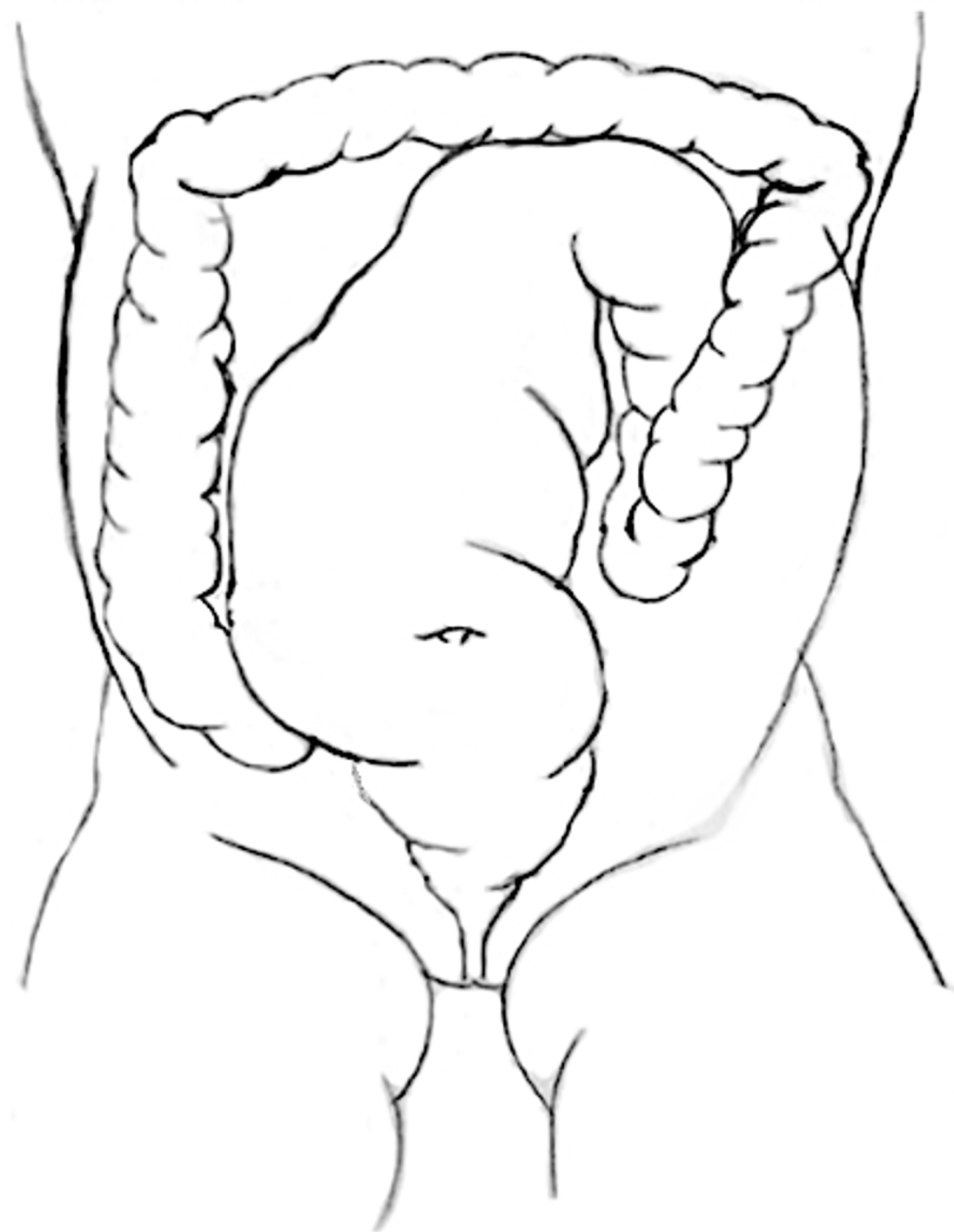
Progressive rectal dilatation

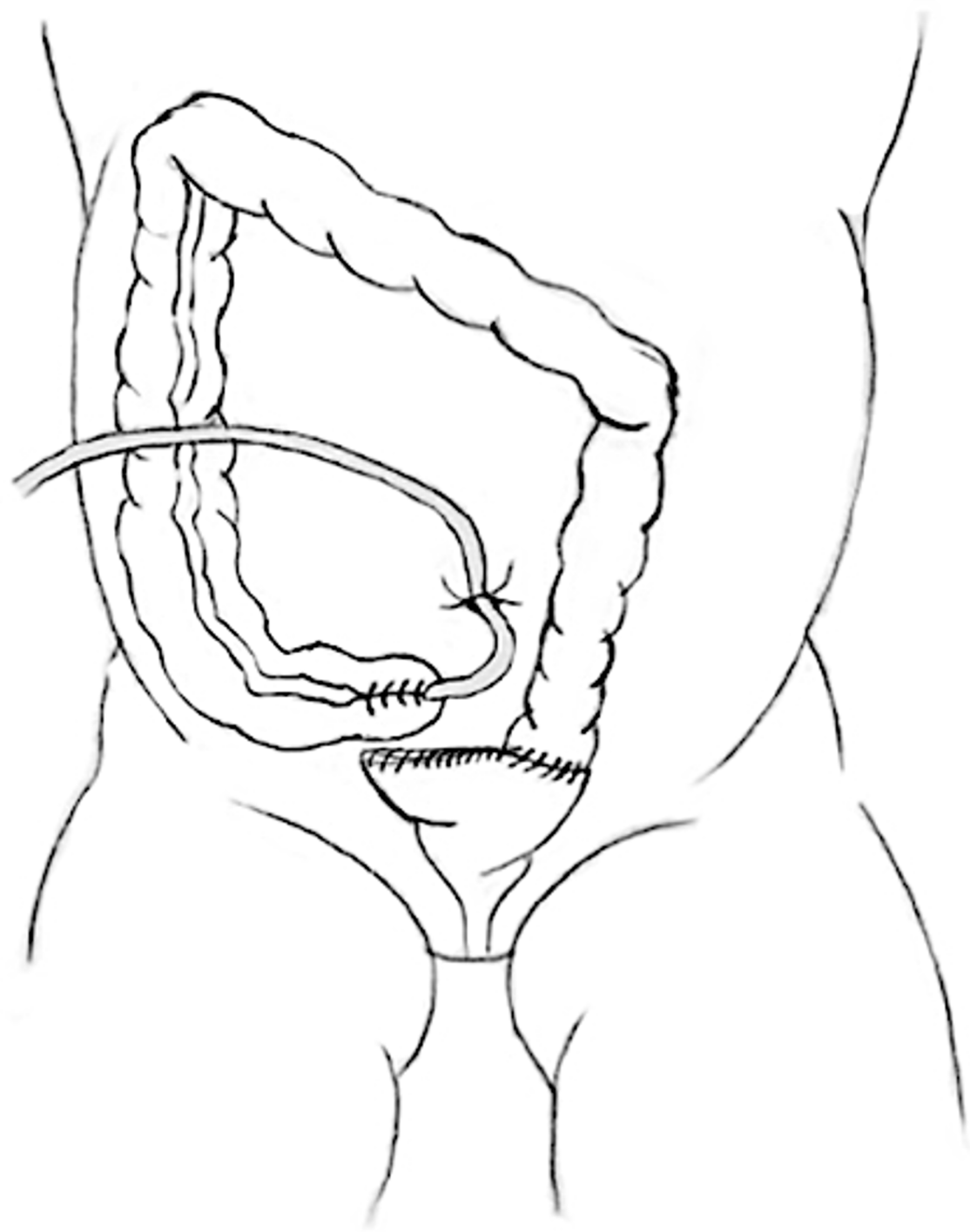
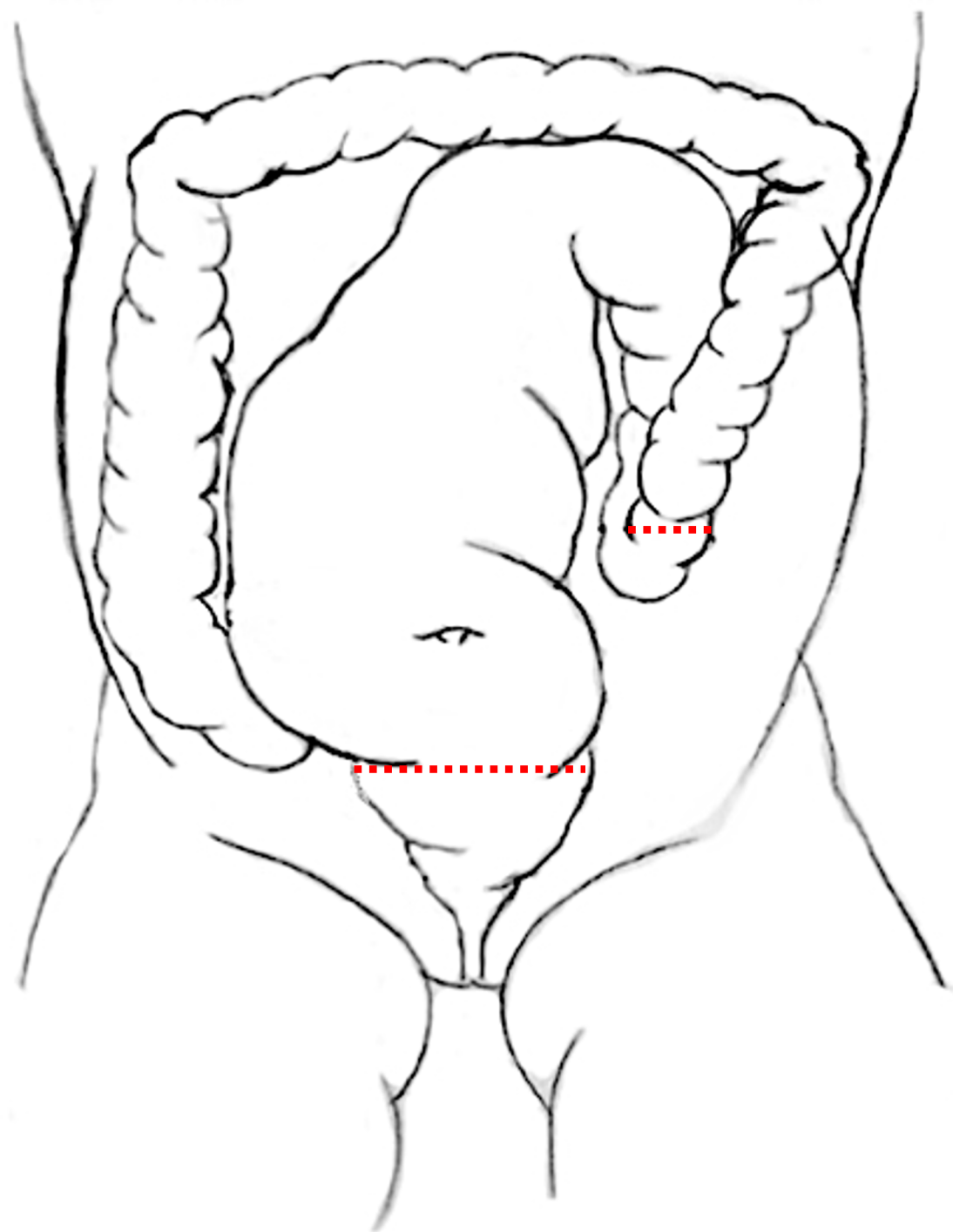
**Megarectum
and
Megasigmoid**

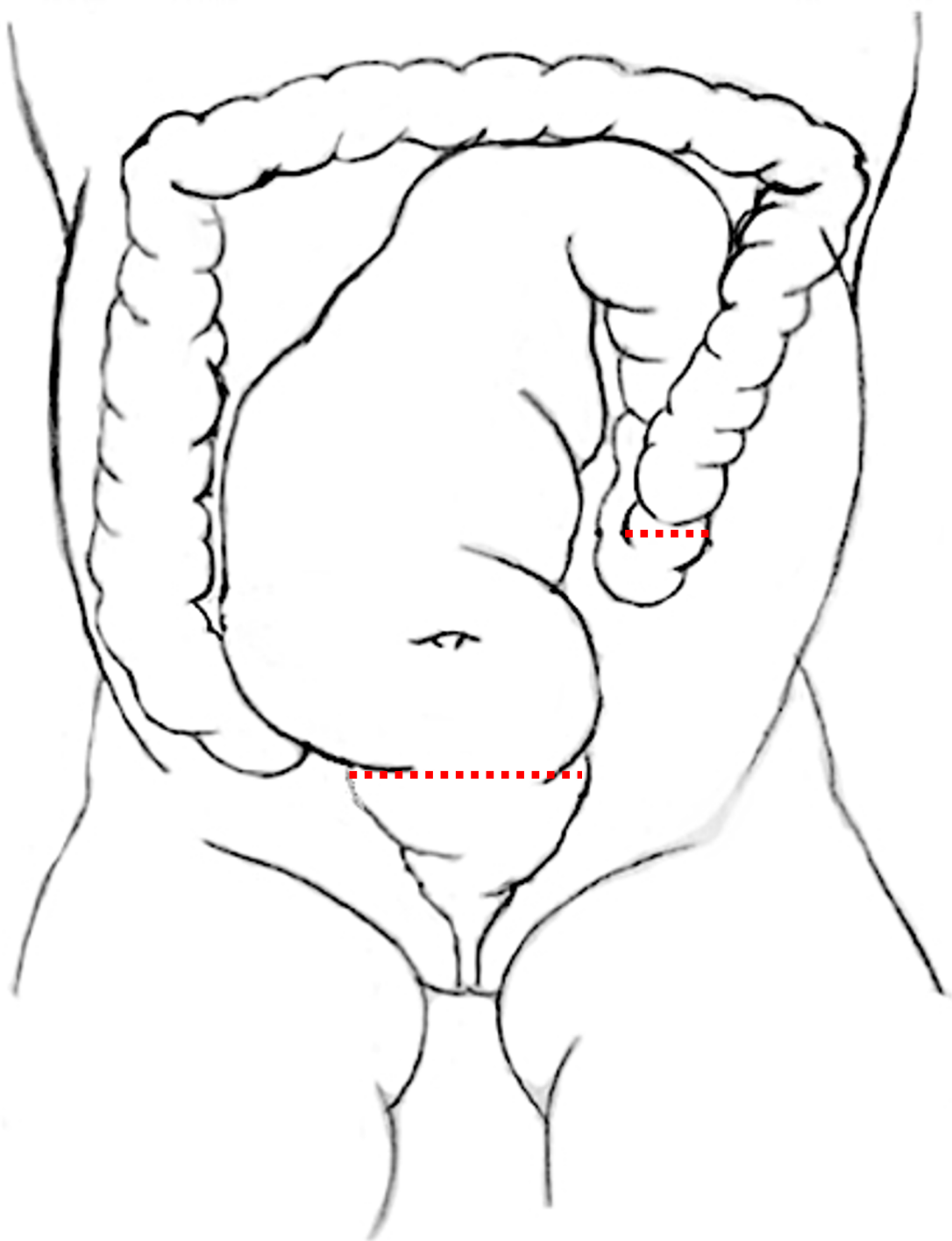
Invaginant Valve Mechanism



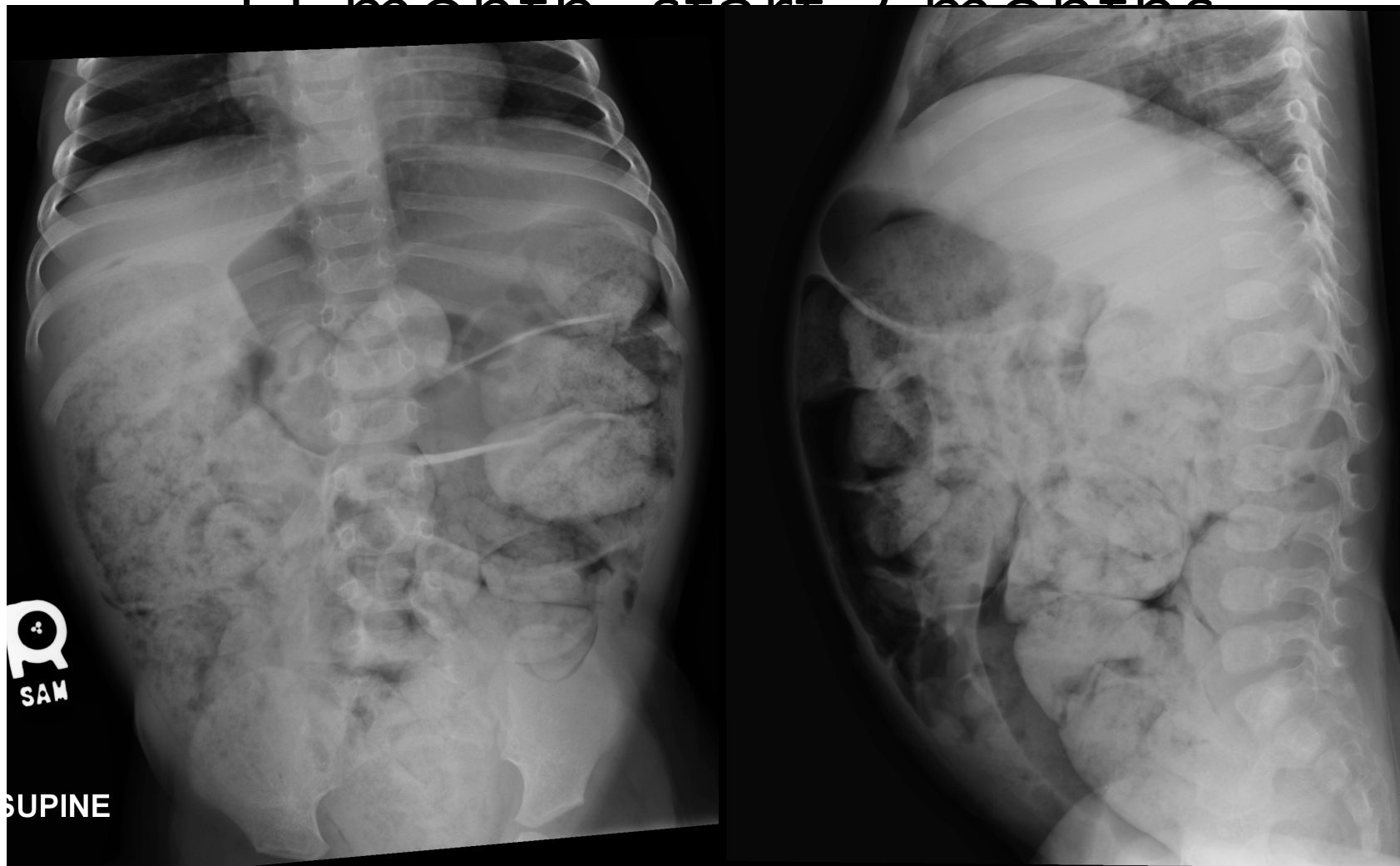


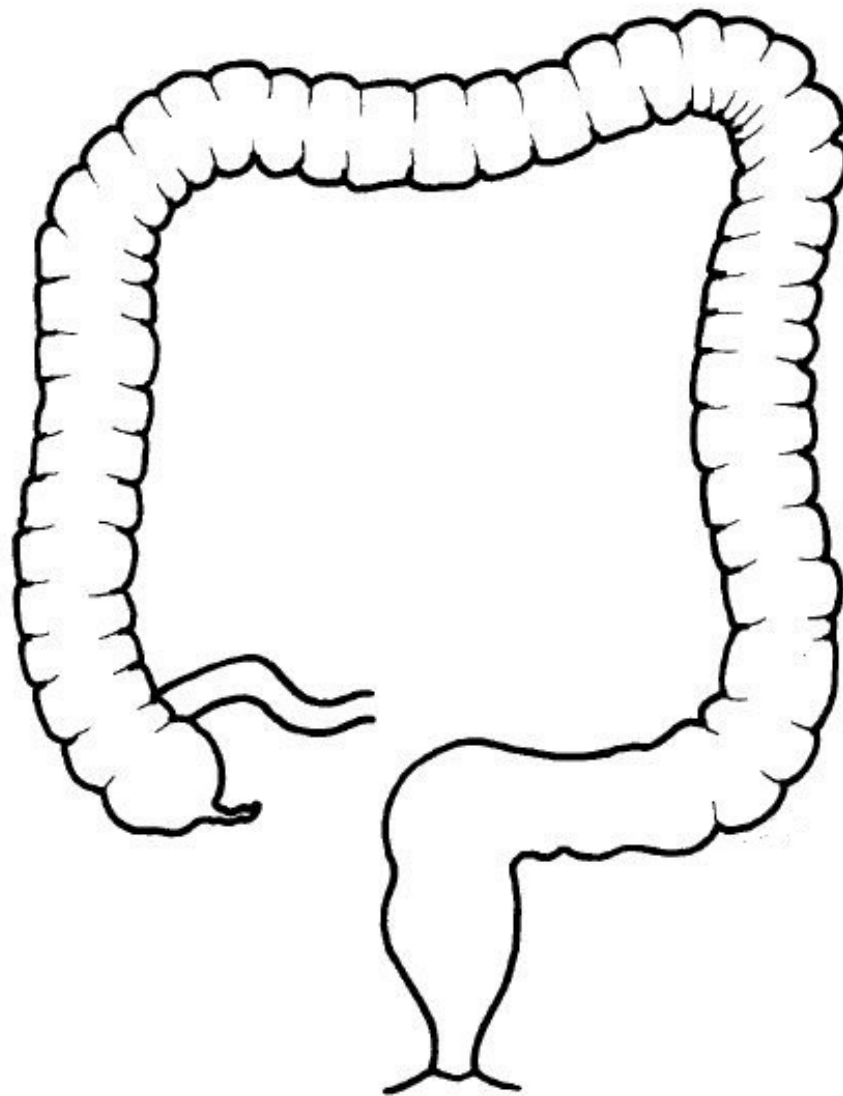






1 1 month start 2 months





Guidelines
Treatment Idiopathic Constipation

Cleanout

Rectal enemas
Manual
NG-Polietilenglicol

Laxative
Trial

Senna

Enema

Rectal enema

Long-term
Follow-up

Risk of fecal impaction

Weaning

Slow and frequent failure

Surgery

Resection
Appendicostomy
Enterostomy





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