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Normative Measures of Colon Length and Width in Healthy Children Based on CT

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Research Article

Keywords: Pediatrics, Colon, Sigmoid, Length, Width, Computed tomography, Constipation, Dolichocolon, Dolichosigmoid

Posted Date: October 14th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10941420/v1

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Additional Declarations: No competing interests reported.

NORMATIVE MEASURES OF COLON LENGTH AND WIDTH IN HEALTHY CHILDREN BASED ON CT

Abstract

Background

To provide normative data on colon length and width in healthy children using 3-dimensional(3D) multiple-point computed tomography(CT) measurements, which may serve as reference values for identifying anatomic abnormalities in children with therapy-resistant constipation(TRC).

Methods

We conducted a single-center retrospective study of children aged 0–17 years, who underwent abdominal CT for trauma or abdominal pain in the emergency department of a tertiary care hospital in 2024. Children with anatomic or functional colonic abnormalities were excluded. The primary outcome was total colon length(cm). Secondary outcomes included total colon length/BSA(cm/m²), rectosigmoid length(cm), rectosigmoid length/BSA(cm/m²), rectal width(cm), and sigmoid width(cm). Descriptive statistics and linear regression were applied, with $p<0.05$ considered significant.

Results

Of 244 children, 162 met inclusion criteria. Median age was 11 years [IQR:7–15], 88 (54%) were boys, median BMI was 20kg/m² [IQR:17–26], and median BSA was 1.4m² [IQR:1.0–1.7]. Mean total colon length was 103±19cm (±2SD:65–141 cm). Median total colon length/BSA was 76cm/m² [IQR:63–93], rectosigmoid length 32cm [IQR:26–40], rectosigmoid length/BSA 24cm/m² [IQR:18–31], rectal width 2.7cm [IQR:2.2–3.4], and sigmoid width 2.5cm [IQR:2.2–3.1]. In univariable analyses, colon lengths and rectal width were associated with age, height, weight, and BSA. In multivariable analysis, only BSA was independently associated with total colon length.

Conclusions

This study provides normative pediatric colon length and width data derived from abdominal CT.

Colon lengths >141cm and rectal widths >3.4cm may be considered atypical. These reference values may facilitate evaluation of anatomic abnormalities in children with colonic dysmotility.

Keywords

Pediatrics

Colon

Sigmoid

Length

Width

Computed tomography

Constipation

Dolichocolon

Dolichosigmoid

Level of Evidence

IV

List of abbreviations

BSA body surface area

CT computed tomography

FC functional constipation

GI gastrointestinal

IBD inflammatory bowel disease

IV intravenous

MRI magnetic resonance imaging

TRC Therapy-resistant constipation

3D 3 dimensional

Introduction

Constipation in children is a global health problem, with a pooled prevalence of 8% (95% CI: 6%–10%) among children aged < 4 years and 11% (95% CI: 9%–14%) among those aged 4–18 years[1]. According to the pediatric Rome V criteria, functional constipation (FC) is defined as the presence of at least two of the following symptoms for a minimum of one month in children aged four years and older: (1) fewer than three bowel movements per week, (2) at least one episode of fecal incontinence per week, (3) a history of excessive stool retention, (4) a history of painful or hard bowel movements, (5) the presence of a large fecal mass in the rectum, and (6) large-diameter stools that may obstruct the toilet[2]. Initial treatment for constipation consists of both non-pharmacological and pharmacological approaches[3,4]. Despite optimal conservative management, some children continue to experience symptoms of constipation with substantial impact on their quality of life, a condition recently defined as therapy-resistant constipation (TRC)[5].

Among children diagnosed with TRC who are referred to a pediatric surgeon (after evaluation by a pediatrician and pediatric gastroenterologist), approximately 10% ultimately require surgical intervention[6]. To guide surgical decision-making, colonic anatomy is typically evaluated using imaging modalities such as plain abdominal radiographs, magnetic resonance imaging (MRI), defecography, and contrast enemas[6] In those who require better understanding of their colonic neuromuscular function, colon manometry (CMAN) can be a valuable assessment[6]. In children with TRC, colonic anatomy is often described using subjective terms such as *dolichocolon*, *dolichosigmoid*, or *megarectum*, which refer to a markedly elongated or dilated colon[7-10].

It is clear that objective definitions for dolichocolon, dolichosigmoid, and megarectum are currently lacking. Concrete quantitative measures of colon and rectosigmoid lengths and widths have not been delineated. We therefore recognized that establishing such definitions would help to characterize anatomic severity and may improve clinical decision-making for children with TRC, and developed this study which aimed to establish reference data on colon and rectosigmoid

lengths and widths in healthy children using a multiple-point measurement technique on computed tomography (CT).

Materials and Methods

Study design & population

This retrospective study was performed in a tertiary children's hospital. CT scans and clinical data for all children 0-17 years old who underwent imaging for the indication of trauma or abdominal pain in the Emergency Department (ED) between January 2024 and December 2024 were abstracted. Patients were excluded if there was: (1) reported trauma of the colon; (2) an organic disease of the gastrointestinal tract (e.g. Hirschsprung disease); (3) an organic disease that potentially affects the function of the gastrointestinal tract (e.g. spina bifida); (4) abdominal cancer; (5) a past diagnosis of constipation, according to referral letters, admission records or follow-up records; (6) a prior gastrointestinal surgery or (7) the inability to perform the required measurements on the imaging files.

Outcomes

The primary outcome was the total colon length in cm and the secondary outcomes were the total colon length/BSA in cm/m^2, the rectosigmoid length in cm, the rectosigmoid length/BSA in cm/m^2, the rectal width in cm and the sigmoid width in cm.

Covariables

Medical records of included patients were reviewed, and the following data was retrieved: age at CT scan, sex, race, ethnicity, height (cm), weight (kg), body mass index (BMI) (kg/m^2) and body surface area (BSA) (m^2). Possible associations of colon lengths and widths with sex, age, height, weight, BMI and BSA were exploratory outcomes of the study. In addition, per age category, the length and width of the predetermined colonic segments (median; IQR 25th and 75th percentile) will be displayed.

Computed Tomography

Abdominopelvic CT scans were performed on one of two scanners: (1) GE Discovery 690 64-slice hybrid PET/CT (GE Healthcare, Waukesha, WI, USA) or (2) Canon Aquilion 128-slice dual energy CT (Canon Medical Systems USA Inc, Tustin, CA, USA). Though the Canon scanner offers the option for dual energy imaging, this technique was not utilized and all patient scans in this study were performed using single energy acquisition. All scans were performed with the patient in the supine position using a breath hold technique. Patients either received intravenous (IV) contrast, oral and IV contrast, IV contrast and rectal contrast or no contrast at all. When utilized, IV contrast was administered as iodinated contrast at standard dosing of 2 ml/kg up to a maximum dose of 100 ml. Oral contrast was given as dilute iodinated contrast with dosing in accordance to patient age. When utilized, rectal contrast was administered as dilute iodinated contrast, with the volume adjusted according to patient age and/or body size.

Image analysis

All eligible CT images were imported into the software 3D Slicer version 5.10.0[11].

Colon length was assessed using a multiplanar reconstruction mode (MPR), a technique for visualizing 3-dimensional (3D) datasets that allows the generation of sectional images, including coronal, sagittal, and oblique images. Total colon length was defined as the sum of predetermined colonic segments, measured as follows: rectosigmoid, from the anal canal to the cross-over of the iliac vessels; descending colon, from the cross-over of the iliac vessels to the splenic flexure, where the colon enters the retroperitoneum; transverse colon, from the splenic flexure to the hepatic flexure, where the colon exits the retroperitoneum; ascending colon, from the hepatic flexure to the end of the cecum. Measurements of colonic segment lengths were conducted on a coronal plane using a distance polyline tool (figure 1). The tool allows manual placement of multiple points to calculate segment lengths in cm.

Colon width was measured at the widest point of each segment: rectum, sigmoid, descending colon, transverse colon, ascending colon, cecum

The widest point of each segment was first identified in MPR mode on a coronal plane. Once this point was located, a double oblique MPR mode was applied to generate a cross-sectional view perpendicular to the direction of the colon on the coronal plane. Width measurements were then taken along two perpendicular axes using a distance line tool, and the average width was calculated (figure 2).

Colonic measurements were independently performed by three authors (CJ, PhD candidate, 2 years of experience; NS, pediatric radiologist, 13 years of experience; BY, pediatric interventional radiologist, 17 years of experience). Inter-rater agreement was assessed by comparing measurements across reviewers. In cases where measurements differed by more than 10%, the reviewers convened to adjudicate discrepancies and reach consensus, after which the consensus values were used for analysis.

Data management and analysis

Continuous variables were summarized as mean ± standard deviation (SD) or median with interquartile range (IQR; 25th–75th percentiles), depending on data distribution. Normality was assessed using the Shapiro–Wilk test. For normally distributed data, comparisons were performed using t-tests; non-normally distributed data were analyzed using appropriate nonparametric tests. Categorical variables were summarized as frequencies and percentages. 95% confidence intervals (CIs) were calculated for mean estimates.

Interobserver agreement was assessed using intraclass correlation coefficient (ICC) based on a two-way random-effects model with absolute agreement for single measurements (ICC [2,1]). A two-sided p value < 0.05 was considered statistically significant.

Associations between absolute colon length and width and demographic or anthropometric variables (sex, age, height, weight, body mass index [BMI], and body surface area [BSA] were evaluated using univariable and multivariable linear regression models. Multicollinearity was assessed using variance inflation factors (VIF). All analyses were performed using R (version 2026.04.0.526).

Ethical considerations

Institutional review board (IRB) approval was obtained for this study (#STUDY00001414).

Results

We identified 244 children who underwent abdominal CT scan imaging in the ED during the study period. 82 patients (33%) were excluded from the analysis due to one of the following reasons: an organic disease of the gastrointestinal tract (e.g. Hirschsprung disease) (n = 14); an organic disease that potentially affects the function of the gastrointestinal tract (e.g. spina bifida) (n = 12); abdominal cancer (n = 7); a past diagnosis of constipation (n = 29); a prior gastrointestinal surgery (n = 9) and, the inability to perform the required measurements on the imaging files (n = 11) (figure 3).

Among the 162 included patients, the median age was 11 years [7–15], and 88 (54%) were male. The median height was 150 cm [123–164 cm], median weight was 47 kg [28–67 kg], median BMI was 20 kg/m^2 [17–26 kg/m^2], and median BSA was 1.4 m^2 [1.0–1.7 m^2] (Table 1). None of the patients were underweight, while 39 (24%) had a BMI >25 kg/m^2.

In total 146/162 patients (90%) received IV contrast, 13/162 patients (8%) received IV and oral contrast, 1/162 (0.6%) received IV and rectal contrast, and 2/162 patients (1.2%) received no contrast at all.

The mean total colon length was 103 ± 19 cm (±2SD: 65–141 cm), and the median rectal width was 2.7 cm (IQR: 2.2–3.4 cm). Therefore, children with a colon length greater than two standard deviations above the mean (>141 cm) or a rectal width above the upper quartile (>3.4 cm) may be considered atypical. Colon length and width data are presented in Tables 2a and 2b.

The median (IQR) of the predetermined colonic segments per age in years are shown in figure 4 and figure 5 and supplementary tables 4 and 5.

The ICC analysis found good agreement between observers for all colonic measurements (between 0.84 and 0.92). In 24 of 162 measurements (14.8%), the interobserver difference

exceeded 10%; these cases were reassessed to obtain consensus values and were excluded from the ICC analysis.

Univariable linear regression was performed for total colon length and width and several variables. Age was associated with total colon length (β = 2.4, 95% CI 1.8-2.9, p = <0.001), rectosigmoid length (β = 0.5, 95% CI 0.1-0.8, p = 0.005), and rectal width (β = 0.04, 95% CI 0.01-0.07, p = 0.006). Height was associated with total colon length (β = 0.4, 95% CI 0.3-0.5, p = <0.001), rectosigmoid length (β = 0.07, 95% CI 0.004-0.1, p = 0.04), and rectal width (β = 0.007, 95% CI 0.001-0.01, p = 0.02). Weight was associated with total colon length (β = 0.4, 95% CI 0.4-0.5, p = <0.001), rectosigmoid length (β = 0.1, 95% CI 0.05-0.17, p = <0.001), and rectal width (β = 0.007, 95% CI 0.002-0.01, p = 0.01). BMI was associated with total colon length (β = 1.5, 95% CI 1.2-1.9, p = <0.001),and rectosigmoid length (β = 0.5, 95% CI 0.3-0.7, p = <0.001). BSA was associated with total colon length (β = 26.0, 95% CI 20.7-31.2, p = <0.001), rectosigmoid length (β = 6.0, 95% CI 2.6-9.3, p = <0.001), and rectal width (β = 0.5, 95% CI 0.1-0.8, p = 0.005). No association was found between sex and colon lengths and widths.

In a multivariable linear regression analysis for total colon length, rectosigmoid length and rectal width only BSA was independently associated with total colon length. For every 1 m^2 increase in BSA, colon length increased by an average of 21.4 cm (95% CI 8.4–34.4; p < 0.001) (table 3). There was no significant correlation between age and sex and colon lengths and widths. Assessment of multicollinearity showed low correlation for sex (VIF 1.07), while moderate multicollinearity was observed for age at CT and BSA, with VIF values of 6.23 and 6.10, respectively. No severe multicollinearity was identified.

Discussion

Through quantifying lengths and widths of predefined colonic segments in healthy children aged 3–17 years undergoing CT scan, we established normative data with a median total colon length of 103 cm and a median rectal width of 2.7 cm for all ages. Children with a colon length greater than two standard deviations above the mean (>141 cm) or a rectal width above the upper quartile (>3.4 cm) may be considered atypical. While absolute colon lengths and rectal width were associated with age, height, weight and BSA, only BSA had an independent relationship with total colon length.

Direct comparison of our findings with previous studies is limited by the lack of normative data on colon length and width in healthy pediatric populations. In addition, heterogeneity between study cohorts, such as differences in bowel physiology related to preparation protocols and the use of contrast enemas, further restricts comparability with existing literature. One retrospective study[12] assessed colon length in 112 children aged 0–11 years without a history of gastrointestinal (GI) disease, using a comparable measurement approach based on CT. In that study, mean colon length increased with age, from 52 cm in children younger than 2 years to 73 cm at 4–6 years and 95 cm at 9–11 years[12]. We similarly evaluated total colon length across age categories. In the 4–6 year age group, our findings indicated greater colon length (91 cm versus 73 cm). Differences in study populations and applied technique might explain this. In children aged 9–11 years, measurements were largely comparable (98 cm versus 95 cm).

Another retrospective study[13], including 19 healthy children without GI disease, aged 7–18 years, applied a 3D skeletonization method to assess colon length on MRI without prior bowel preparation. Although the mean total colon length reported in that study (96 ± 3 cm) was comparable to the value observed in our cohort, the mean total colon length normalized to BSA (56 ± 2 cm/m²) was approximately 20 cm/m² lower than that observed in our cohort[13]. Several factors may account for this discrepancy, including differences in study population, sample size,

and methodological approach. In particular, the skeletonization technique may have intrinsic limitations in accurately tracing highly tortuous bowel segments, as the algorithm can intermittently deviate between adjacent loops, potentially resulting in an underestimation of total colon length.

In the adult literature, only two studies have investigated colon length using 3D imaging in healthy adults. One study[14] employed a novel electromagnetic 3D-Transit capsule to measure colon length in 25 healthy adults (mean age 28 years) without GI disease, and these measurements were subsequently analyzed on MRI using a 3D topological skeleton algorithm implemented in Matlab®. The reported mean total colon length on MRI was 95 ± 15 cm, ranging from 75 to 153 cm[14]. In a second study[15], MRI scans from 57 healthy adults (mean age 28 years) were assessed by manual tracing of four anatomical segments, with total colon length calculated as the sum of these segments. The mean total colon length in this cohort was 127 ± 2 cm, with an upper limit of normal of 154.5 cm[15].

Our mean total colon length of 103 cm aligns more closely with reported adult values (95–127 cm). This observation may partly be explained by a marked increase in median colon length observed in our cohort around 10–11 years of age, with an approximate 26 cm increase between these age groups, together with the relatively high median age of 11 years in our study population.

An objective definition of rectal width in a healthy pediatric population has been described only sparsely in the literature, although the recto-pelvic ratio has previously been used as a surrogate measure of rectal size[16]. One ultrasonography-based study assessing rectal diameter and wall thickness in 100 healthy children, without a history of GI disease, reported a smaller mean rectal diameter of 1.95 ± 0.48 cm (mean age 3 ± 8 years) compared to the rectal width of 2.7 cm observed in our cohort[17]. This discrepancy may be partially explained by methodological differences. In our study, children did not undergo bowel preparation prior to CT imaging, whereas the ultrasound study did not report whether bowel preparation was performed. The presence of fecal material may result in overestimation of rectal width. In addition, intraluminal air or the use of

contrast agents during CT imaging in our study, may introduce artifacts that further contribute to overestimation of rectal width.

BSA was the strongest independent predictor of colon length in multivariable linear regression analysis. Normalization for BSA accounts for differences in both height and weight, which are important determinants of organ size. In adult studies, colon length has also been shown to correlate strongly with body weight[18], highlighting the relevance of correcting for body size when interpreting colonic measurements. Given this, we strongly recommend that future studies evaluating colon length normalize measurements to BSA.

A recent study evaluating the prevalence of dolichocolon in children with constipation demonstrated that this anatomical variant is highly prevalent among pediatric patients with TRC. Three blinded pediatric gastroenterologists independently evaluated contrast enemas for features of colonic redundancy consistent with dolichocolon. Dolichocolon was defined as any portion of the sigmoid colon extending above the iliac crest line and/or any portion of the transverse colon extending below the iliac crest line, with or without redundant flexures. Among 155 contrast enemas reviewed, dolichocolon was identified in 74.1% of children younger than 2 years, 88.6% of those aged 2–4 years, 68.8% of those aged 5–10 years, and 47.6% of adolescents aged 11–17 years [10]. Consistent with these findings, several studies have suggested that children with TRC have longer colons than children without constipation[12,19-21]. Similar observations have also been reported in adults with TRC including a cohort of 38 individuals aged 40 years or older[22]. However, whether colonic elongation represents a predisposing anatomical factor or develops secondary to chronic fecal retention remains unclear. Chronic fecal retention may induce structural and functional changes in the colonic longitudinal muscle layer, potentially resulting in progressive colonic elongation. Future studies integrating standardized anatomical measurements with objective assessments of colonic function, including colonic transit studies, colonic manometry, and cine-MRI, are needed to further elucidate the relationship between colonic morphology and constipation pathophysiology.

In the present study, we provide a comprehensive overview of colon length and width in a large cohort of healthy children (aged 3–17 years) using a multiple-point measurement technique applied to 3D CT imaging. CT offers high spatial resolution and allows for multiplanar reconstructions, enabling detailed visualization of anatomical structures and enhancing the precision and reproducibility of measurements compared with two-dimensional modalities[23].

Despite these methodological strengths, we acknowledge that the data from this study should be interpreted in the light of some limitations. One important limitation of this study is that all measurements were obtained from CT imaging, limiting the direct comparability of our findings with the imaging modalities most commonly used in the work-up of pediatric TRC, including plain abdominal radiographs, ultrasound, and contrast enemas. The routine clinical use of CT for assessing colon length and width in conditions such as TRC or other GI disorders remains limited. The primary concern is exposure to ionizing radiation, which results in higher effective doses than conventional radiography or other imaging modalities[23]. Additionally, many CT protocols require contrast administration, either oral, rectal, or IV, to optimize luminal distention and soft-tissue contrast. While contrast can improve visualization and measurement accuracy, it introduces potential risks, including allergic reactions, nephrotoxicity, and increased procedural complexity[23,24]. In our study, the use of enteral contrast may have generated artifacts that can overestimate colon length or width, particularly in the presence of high contrast concentration or air interfaces. The artifacts though, are also likely present in other modalities MRI or bowel enema. Finally, no bowel preparation was administered in this study, which may have contributed to partial colonic collapse in some segments. This can make measurements more challenging and may lead to under- or overestimation of colonic measurements.

Although CT is not currently supported in the diagnostic work-up of TRC, the data generated in this study is transferable to MRI sequences. MRI has the advantage of being free of ionizing radiation, intravenous contrast, and bowel preparation, making it a clinically acceptable and

feasible alternative in TRC, which with this translation of data to MRI may play a future role in diagnosis of TRC. Future work should focus on translating these measurements to other commonly used diagnostic modalities, such as plain abdominal radiographs, ultrasound and contrast enemas, to enhance clinical applicability.

Conclusions

This study provides reference data on colon length and width in healthy children undergoing abdominal CT for trauma or abdominal pain, using a 3D multiple-point measurement technique. Total colon length was significantly correlated with BSA. A colon length greater than two standard deviations above the mean (>141 cm) or a rectal width above the upper quartile (>3.4 cm) may be considered atypical and could aid in the assessment of pediatric patients with TRC.

Figure legends

Figure. 1 Example of a Coronal CT sequence of a child visualizing a with contrast filled gastrointestinal tract. A distance polyline tool is used to measure colon length.

Figure. 2 Example of a colon width measurement taken along two perpendicular axes using a distance line tool

Figure 3. Flow chart patient selection

Figure 4. Colon length stratified per age group

Figure 5. Colon width stratified per age group

Plain language summary

We assessed colon lengths and widths in healthy children using a three-dimensional multiple-point measurement technique on abdominal computed tomography (CT).

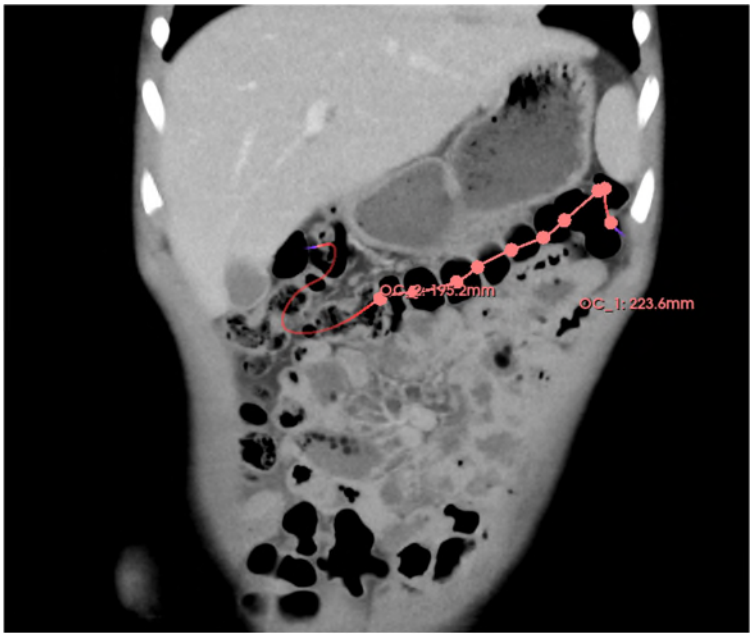
Overall, 162 children were included with a median age of 11 years [IQR:7–15], and 88 (54%) were boys. Mean total colon length was 103±19 cm (±2SD:65–141 cm). Median rectosigmoid length was 32 cm [IQR:26–40], rectal width 2.7 cm [IQR:2.2–3.4], and sigmoid width 2.5 cm [IQR:2.2–3.1]. In univariable analyses, colon lengths and rectal width were associated with age, height, weight, and BSA. In multivariable analysis, only BSA was independently associated with total colon length.

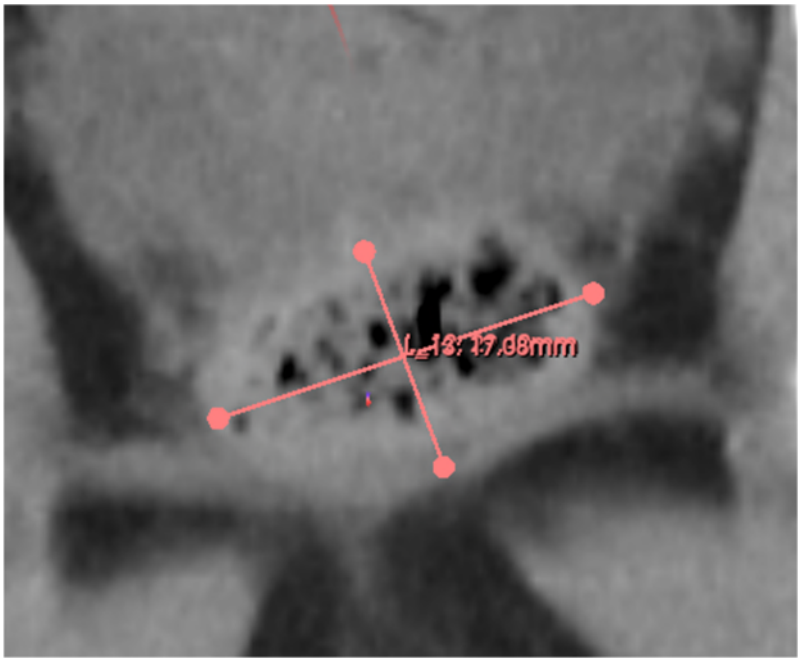
Colon lengths >141 cm and rectal widths >3.4 cm may be considered atypical. These reference values may facilitate evaluation of anatomic abnormalities in children with colonic dysmotility.

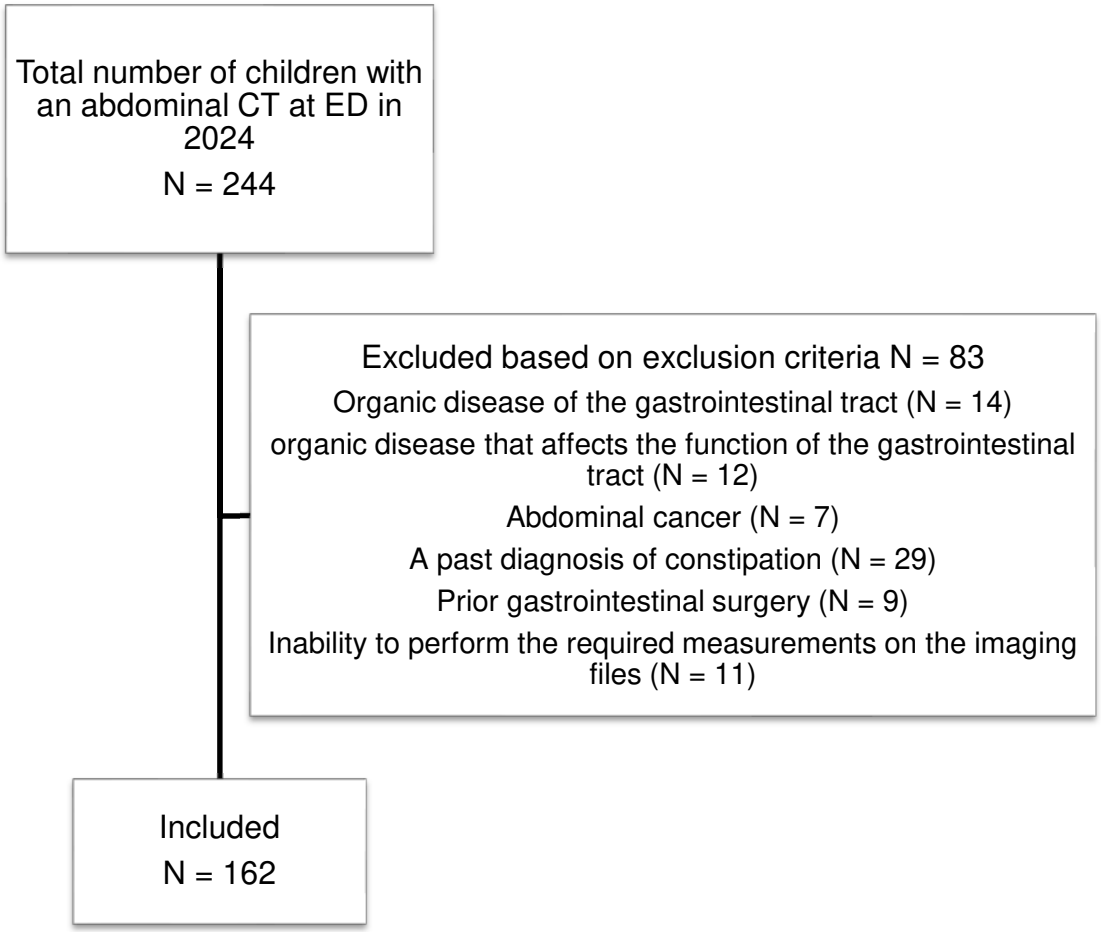
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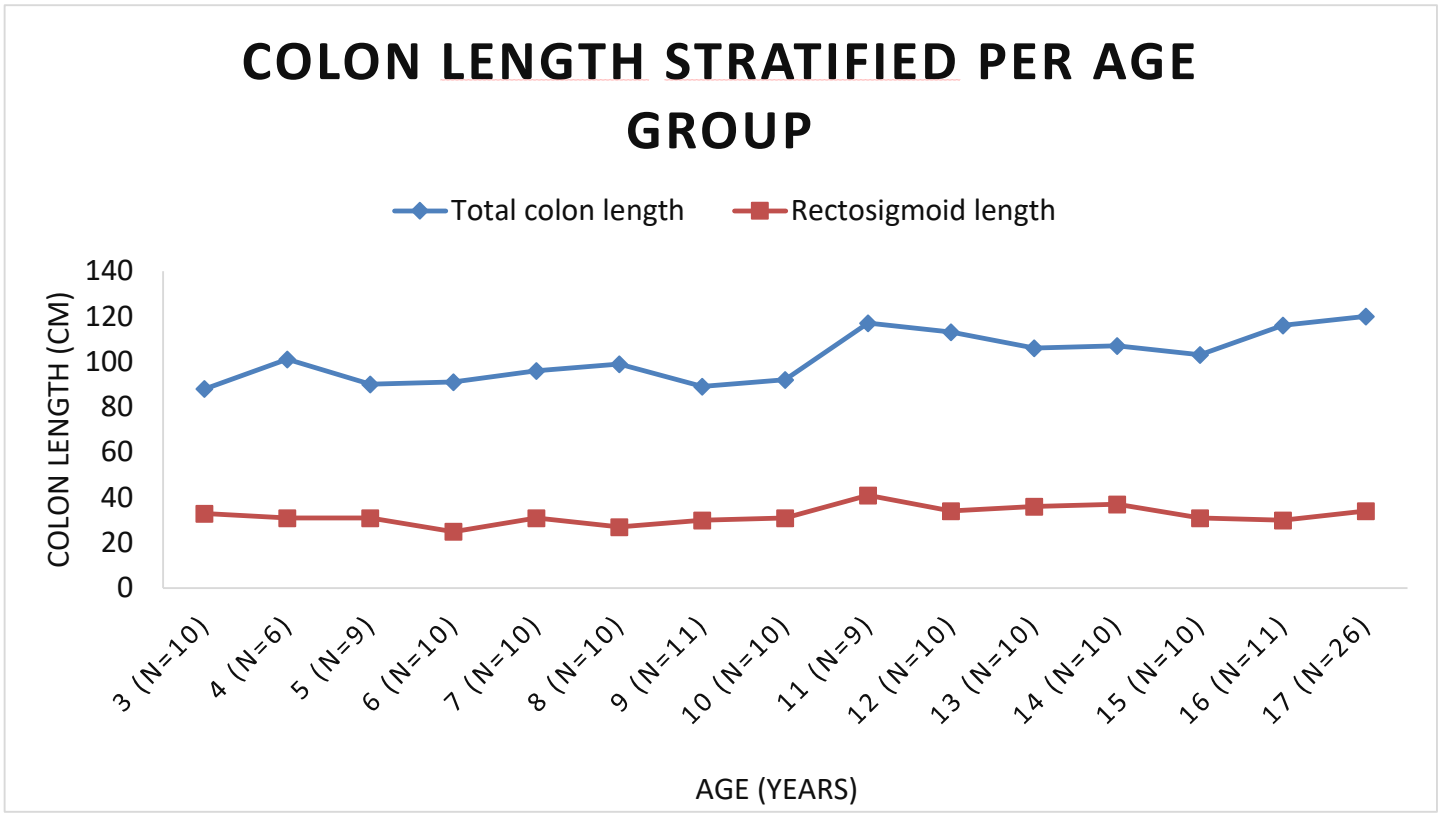
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OC_2: 195.2mm
OC_1: 223.6mm


L=18.17.08mm


Total number of children with an abdominal CT at ED in 2024
N = 244
Excluded based on exclusion criteria N = 83
Organic disease of the gastrointestinal tract (N = 14)
organic disease that affects the function of the gastrointestinal tract (N = 12)
Abdominal cancer (N = 7)
A past diagnosis of constipation (N = 29)
Prior gastrointestinal surgery (N = 9)
Inability to perform the required measurements on the imaging files (N = 11)
Included
N = 162


COLON LENGTH STRATIFIED PER AGE GROUP
Total colon length
Rectosigmoid length
COLON LENGTH (CM)
140
120
100
80
60
40
20
0
3 (N=10)
4 (N=6)
5 (N=9)
6 (N=10)
7 (N=10)
8 (N=10)
9 (N=11)
10 (N=10)
11 (N=9)
12 (N=10)
13 (N=10)
14 (N=10)
15 (N=10)
16 (N=11)
17 (N=26)
AGE (YEARS)

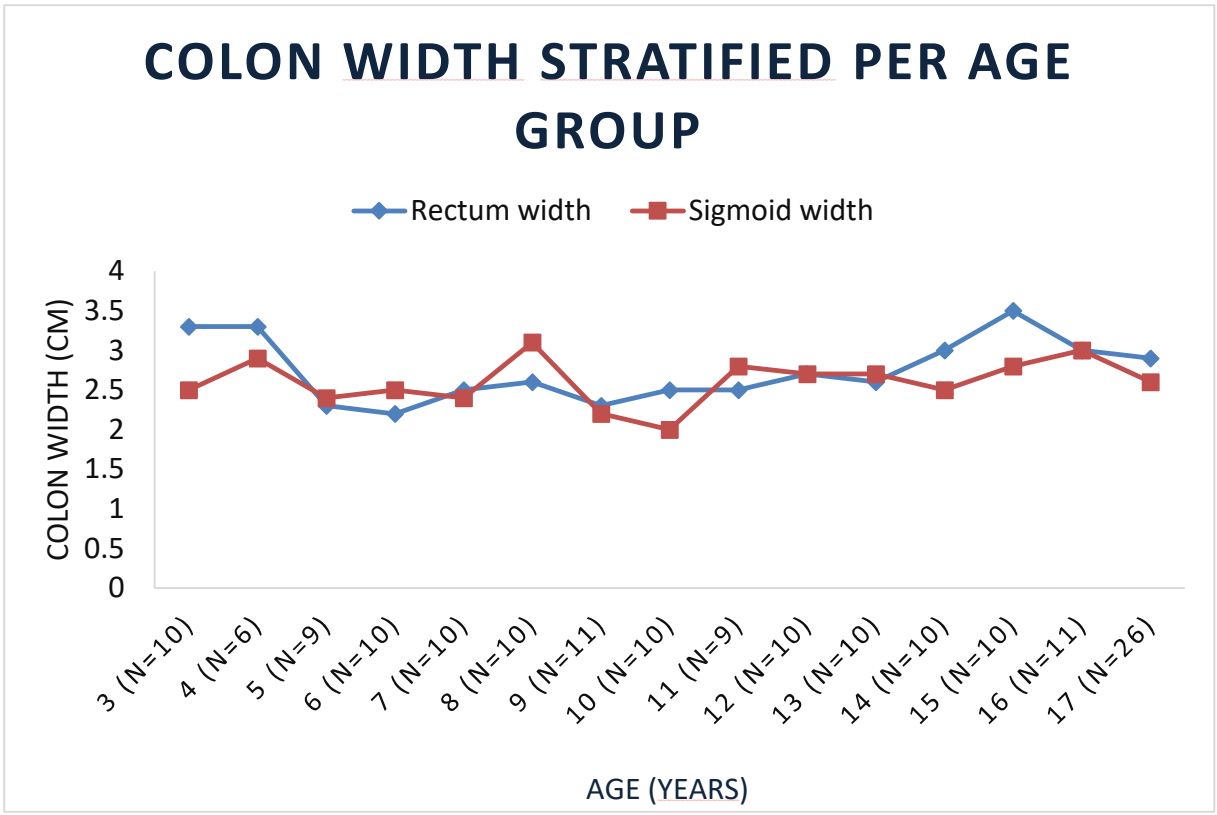

COLON WIDTH STRATIFIED PER AGE GROUP
Rectum width
Sigmoid width
COLON WIDTH (CM)
4
3.5
3
2.5
2
1.5
1
0.5
0
3 (N=10)
4 (N=6)
5 (N=9)
6 (N=10)
7 (N=10)
8 (N=10)
9 (N=11)
10 (N=10)
11 (N=9)
12 (N=10)
13 (N=10)
14 (N=10)
15 (N=10)
16 (N=11)
17 (N=26)
AGE (YEARS)

Table 1. Patient characteristics

Patients, n	**162**
Anthropometric Data	
Sex, male, n (%)	88 (54)
Age, years (median [IQR], range)	11 [7-15], 3-17
Height, cm (median [IQR])	150 [123-164]
Weight, kg (median [IQR])	47 [28-67]
BMI, kg/m^2 (median [IQR])	20 [17-26]
BSA, m^2 (median [IQR])	1.4 [1.0-1.7]
Race/ethnicity, n (%)	
Non-Hispanic white	13 (8)
Non-Hispanic black or African American	73 (45)
Latino or Hispanic (of any race)	63 (39)
Other/mixed	9 (6)
Unknown	4 (2)

***IQR* interquartile range; *BMI* body mass index; *BSA* body surface area**

Table 2a. Distribution of CT scan-based colon length, rectosigmoid length, rectal width and sigmoid width among children aged 3-17 years old.

	Total Colon Length (cm)	**Rectosigmoid Length (cm)**	**Rectal Width (cm)**	**Sigmoid Width (cm)**
Median	xx	32	2.7	2.5
Interquartile range	xx	26-40	2.2-3.4	2.2-3.1
Top quartile	xx	40	3.4	3.1
Mean	103	xx	xx	xx
SD	19	xx	xx	xx
95% CI	84-122			
2SD	38	xx	xx	xx
±2SD	65-141	xx	xx	xx

Table 2b. Distribution of CT scan-based colon length and rectosigmoid length among children aged 3-17 years old relative to BSA.

	Total Colon Length /BSA (cm/m^2)	**Rectosigmoid Length/BSA (cm/m^2)**
Median	76	24
Interquartile range	63-93	18-31
Top Quartile	93	31

Table 3. Multivariable Linear Regression Total Colon Length

	B	95% CI	β	t	p
Sex	-2.60	[-7.76-2.54]	-0.07	-1.00	0.32
Age	0.49	[-0.85-1.84]	0.12	0.73	0.47
BSA	21.41	[8.38-34.44]	0.52	3.25	0.001

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Graphicalabstract.png
- STROBEchecklistcohort.docx
- Suppltable4.docx
- Suppltable5.docx