Case Report

Redundant: A case of complicated dolichocolon in a neonate

Richard Seguritan, MD*, Joseph Bibawy, DO*, Thomas Giaimo, MD

Richmond University Medical Center, Department of Radiology, 355 Bard Avenue, Staten Island, NY, USA

A R T I C L E   I N F O

Article history:
Received 28 May 2019
Revised 4 June 2019
Accepted 27 June 2019
Available online 18 July 2019

Keywords:
Pediatric dolichocolon
Fluoroscopy
Barium enema

A B S T R A C T

Dolichocolon has been described as a developmental variant and is characterized by redundancy of the colon. Diagnosis is based off clinical symptoms and barium enema or CT-colonography. This redundancy is often seen in the adult and elderly population, with pediatric prevalence limited to case reports. Information regarding radiologic evaluation is limited, as most cases are documented outside of the radiology literature. This case report demonstrates a complex course of transient symptoms of constipation, obstruction, and suspected volvulus in a 1-month-old with dolichocolon. A retrospective review of the images offers insight into gaining suspicion of this variant in radiographs and fluoroscopic exams.

© 2019 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license. (http://creativecommons.org/licenses/by-nc-nd/4.0/)

Introduction

Dolichocolon has been described as a developmental variant and is characterized by redundancy of the colon. An increased length in the colon was first described in 1820 by Monterossi through cadaveric examination [1]. In 1924, Bryant's examination of cadaveric intestines noted significant variation in length of the small intestine and colon, which disproved the earlier works of Treves, who proposed a constancy in length in infants [2]. In a series of works by Black during 1836 and 1911, he further established variations in positioning and elongation found in the colon [3]. With the advent of computed tomography, Phillips et al reported lengths of the colon, with significant findings of mobility of the ascending and descending segments [4].

Radiography of the redundant colon was first visualized by Kienbock using bismuth meal and bismuth clysma [5]. Lardennois and Aubourg used the similar technique to further document this redundancy and coining anatomic variant, dolichocolon [6]. In the following years, many case studies were published utilizing this new X-ray technique [7]. Years later, dolichocolon was characterized by a sigmoid loop rising over the line between the iliac crests, a transverse colon below the same line, and extra loops at the hepatic and splenic flexure [8].

Conflict of Interest: The authors have no conflict of interest to disclose.

Acknowledgments: We would like to thank the legal guardians of the patient for giving us permission to report his case.

Funding: The authors had not received any funds.

Informed Consent: Informed consent was obtained from patient’s legal guardians to report his case. This article does not contain any experimental procedure, so the approval of institutional ethical committee wasn’t applicable.

* Corresponding authors.

E-mail addresses: rsegritan@rumcsi.org (R. Seguritan), jbibawy@rumcsi.org (J. Bibawy), tgiaimo@rumcsi.org (T. Giaimo).

https://doi.org/10.1016/j.radcr.2019.06.014

1930-0433/© 2019 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license. (http://creativecommons.org/licenses/by-nc-nd/4.0/)
Case report

A 13-day-old male born at 40 weeks gestation by normal spontaneous vaginal delivery presented with projectile vomiting after each feed for 3 days. He was exclusively breast-fed and began to have decreased interest in feeding. The mother reported 1-2 bowel movement per day with yellow pasty stool. Physical examination revealed a distended abdomen with hyperactive bowel sounds along with visible peristaltic bowel loops. Two subsequent abdominal ultrasounds were performed accompanied with small feeds to evaluate for suspected hypertrophic pyloric stenosis, both of which were unremarkable.

An abdominal radiograph was performed (Fig. 1a) on the second day which revealed a nonspecific bowel gas pattern. On the third day of admission, the patient had decreased feeding, increasing episodes of nonbloody, nonbilious vomiting, and increased yellow pasty bowel movements. Visible peristaltic bowel loops were also becoming more prominent on physical exam. A subsequent radiograph (Fig. 1b) was performed the next day that was suggestive of bowel obstruction. In retrospect, with comparison of the prior day’s radiograph, the air-filled rectum and sigmoid projected onto contralateral sides. That same day, a contrast radiography study of the upper gastrointestinal tract, also known as an upper GI series, was performed to evaluate for malrotation with midgut volvulus was performed which revealed a normal course of the duodenum and was otherwise unremarkable. A small bowel follow-through (Fig. 2) was pursued which showed contrast reaching and passing through large bowel. Again, when retrospectively reviewing the exam, the previously seen right sided air filled sigmoid now projected leftward. Over the course of the next 3 days, the feeding tolerance improved and frequency of vomiting decreased. The patient was discharged home given the improvement of symptoms.

Fifteen days after discharge, the patient returned with vomiting and constipation relieved by rectal stimulation. Interval repeat radiographs showed similar appearance of the varying degrees of dilated bowel loops and abdominal ultrasounds were negative for intussusception or pyloric stenosis. Barium enema (Figs. 3 and 4) was pursued for evaluation of Hirschsprung’s disease that revealed an abnormal tortuous course of the colon along with laxity of the bowel suggesting a degree of malrotation.

Patient underwent an exploratory laparotomy that revealed 17 cm of redundant sigmoid which was resected; the remaining sigmoid was anastomosed to the rest of the colon. Histopathology of sigmoid samples revealed normal colon with ganglion cells in the submucosa, thereby excluding possibility of Hirschsprung’s disease. Colon rest was maintained and patient was given total parenteral nutrition. Resolution of clinical symptoms were demonstrated upon postoperative follow-up leading to successful discharge of the patient to the care of his guardians.

Discussion

Most of the literature regarding dolichocolon revolves around dolichocolon that presents later in life. Our case demonstrates
Fig. 2 – PA radiographs of small bowel follow through after upper GI series was performed. (a) Dilatation of likely large bowel with the air filled sigmoid projected to the right (white arrow). (b) Radiograph performed 65 minutes later reveals decompression of the previously seen dilated bowel. The previously seen right sided air filled sigmoid is now projecting leftward (open arrow).

Fig. 3 – Fluoroscopic spot images of a barium enema. (a) PA projection showing retrograde transit of contrast to the right and moving posterior midline. (b) Lateral projection showing the transit moving anterior and then looping onto itself. (c) Right posterolateral projection demonstrating further transit of contrast up to the posterior left upper quadrant, the supposed splenic flexure.

Radiographic findings that may be applicable to the infantile population.

Radiographic evaluation in our patient demonstrated subtle findings that easily can be overlooked. In the setting of transient constipation, obstruction, or suspected volvulus, careful examination of abdominal radiographs may be critical in guiding appropriate management. Although any possible suspicion of volvulus would automatically warrant an upper gastrointestinal series and small bowel follow through, sequential radiographs may have provided more diagnostic insight in our case. The aerated sigmoid projecting over the left and right sides were evident in preupper
Fluoroscopic spot images of a barium enema.

(a) Right posterior oblique (RPO) fluoroscopic spot image of contrast transit which was impeded at the left upper quadrant, even with substantial delay.

(b) The radiologist’s hand projects over the abdomen in this magnified RPO view showing manual displacement of the folded bowel inferiorly (open arrow), suggesting laxity of the respective bowel.

GI series examination from the days 2 and 3 radiographs as well as within sequential small bowel follow-through radiographs. This appears to be a sensitive sign for diagnosing distal colonic anatomic abnormalities such as dolicho-colon or intestinal malrotation. The upper GI series was not sensitive due to the transient nature of the obstructive process, likely obstructing and decompressing transiently over time.

Barium enema is the diagnostic test of choice for dolicho-colon, especially for an infant where CT colonography will give unnecessary X-ray exposure in addition to being limited due to lack of mesenteric fat to provide contrast between segments of bowel. Retrograde opacification of the bowel can delineate the anatomic abnormality. In our case, manual compression displacing bowel demonstrated the suggestion that there was nonadherence or laxity of that respective bowel segment, which is typically unusual in an infant. Manual compressive maneuvers may be attempted when performing barium enemas on this group of patients to increase the sensitivity of dolicho-colon.

REFERENCES

[1] Monterossi P. Uber widernatürliche Biegungen des Dickdarms als Ubrfache des Todes neugeborener Kinder. Deutsch Arch Physiol 1820;6:556–71.
[2] Bryant J. Observations upon the growth and length of the human intestine. Am J Med Sci 1924;167:499–520.
[3] Black CE XI. Displacements of the colon. Ann Surg 1912;56:888–99.
[4] Phillips M, Patel A, Meredith P, Will O, Brassett C. Segmental colonic length and mobility. Ann R Coll Surg Engl 2015;97:439–44.
[5] Kienböck R. Ueber das Sigma elongatum mobile (Röntgenbefund). Muench Med Wochen 1913;60:68–70.
[6] Lardenois G, Aubourg P. Allongements segmentaires du gros intestin les dolichocolies. Jour Radiol Electrol 1914;1:65–74.
[7] White FW. The redundant colon. Med Clin N Am 1924;8:1611–33.
[8] Caffey J. The large intestine. In: Caffey J, editor. Pediatric X-ray diagnosis. Chicago: Book Medical Publishers Inc; 1961. year p. 613–46.