



Variations of sigmoid colon – A Case Series

B Alka¹, C Mrudula², S Surraj³

¹Assistant Professor, Department of Anatomy, AIIMS Bibinagar, Telangana, India.

²Additional Professor and Head, Department of Anatomy, AIIMS Bibinagar, Telangana, India.

³Assistant Professor, Department of Anatomy, AIIMS Bibinagar, Telangana, India.

Received Date: 22/01/2023

Acceptance Date: 10/03/2023

Abstract

Background: Variations of the sigmoid colon are not uncommon owing to the fact that the hindgut or midgut predisposes to a lot of rotational anomalies in single or in whole. This article highlights the anomalous series of right sided sigmoid colons observed with varying degrees in part or in whole while doing routine cadaveric dissections. This case series also helps the readers to appreciate the embryology of gut development better and it also helps the surgeon in increasing his acumen for pain detection related to viscera

Keywords: Colon, sigmoid, left, right

Corresponding Author: Dr. C Mrudula, Additional Professor and Head, Anatomy, AIIMS Bibinagar, Telangana, India.

Email: avdatye@gmail.com

Introduction

Anomalies of the gastro-intestinal tract in part or in whole with regard to their position or embryonic rotation are quite common in children and not so uncommon in adults. However, isolated mal-positioning of specific viscera without any major associated anomalies of other viscera is a rare phenomenon, especially in adults. A series of such anomalies noticed during a routine dissection of cadavers embalmed with 37% formalin, in the department of anatomy at AIIMS Bibinagar, Telangana, India, were that of the sigmoid colons that had shifted toward the median plane in the hypogastric region instead of occupying a pelvic position on the left side. The terminal portion of the descending colons suspending the sigmoid colon were also found to occupy the midline umbilical region, whereas the proximal portion of the descending colons were in the left iliac region curving towards the right side. These anomalies are quite rare owing to the fact that all derivatives of the hindgut or midgut are usually equally involved and group together during an anomalous midgut rotation, unlike these. These anomalies also hold clinical relevance to the treating physician or surgeon in localizing pain or other inflammatory symptoms of viscera usually located in the left iliac region that may be misleading with regard to the present case series.

Materials and method

The study was carried out in total 15 cadavers. During routine cadaveric dissection sigmoid colon was observed for variations like redundant loop, volvulus, laterality, excessive length, loop or malrotation. The cadavers were fixed in 37% formalin and this case series was observed (**Fig 1 and Fig 2/**) as a part of routine undergraduate dissection and training demo for MBBS students

Discussion

Variations of sigmoid colon are not uncommon. The sigmoid colon constitutes one of the most variable parts of the large intestine^[1,2].

Volvulus, redundant loop, duplication, malposition or malrotation like variations are reported in literature.

In our study, we found a redundant loop of sigmoid colon in which sigmoid colon was on the right side instead of left. Rest of the large intestine and small intestine orientation is normal. When observed entire abdominal cavity, all organs were normal except liver. The anatomical position of liver was abnormal. It was everted, the inferior surface of liver was visible.

A redundant colon is defined as one that is too long to fit into its owner's body without undergoing reduplication^[3]. The embryological basis of a redundant loop of sigmoid colon, as in the present case, may be explained by the abnormal elongation of the hindgut and subsequent persistent excessive elongation of the sigmoid colon^[4,5].

According to the classification system that has been suggested by Kanagasuntheram^[4] and his colleagues, a redundant colon may be collocated into four categories: I: presence of ascending and descending mesocolon, II: presence of double hepatic flexure, III: extension of the sigmoid colon into the abdomen, IV: the sigmoid colon is displaced towards the right side.

Maria Zarokosta^[1] reported a case of redundant loop of sigmoid colon accidentally discovered during colectomy surgery. Gupta Indragit^[6] reported a case of redundant loop associated with variation in course of inferior mesenteric artery while Charles L reported in his study, the redundant sigmoid with various lengths.

A redundant loop of sigmoid colon may remain asymptomatic or it may lead to urinary, digestive and vascular complications^[7]. The symptoms that may arise from this condition are generally pronounced constipation, indefinite discomfort over the colon, indigestion, loss of weight, insomnia, pain and tenderness in the right iliac fossa^[8]. Its presence is associated with acute and chronic pathological conditions, sigmoid volvulus and serious confusions in radiological diagnosis and instrumentation. Elongation and disposition of both sigmoid colon and mesosigmoid due to redundant colon encumbers surgical maneuvers during colectomy and poses a severe risk factor for accidental damage or functional disturbance of the neighboring anatomical structures. Pain is caused by spasm proximal to the point of redundancy. The symptoms may suggest gastric ulcer, heart disease, chronic obstruction of bowel in addition to appendicitis. In diagnosing these conditions the possibility of a redundant colon should be kept in mind.

Sometimes not only the sigmoid but also descending colon are known to present redundant loops, such conditions are also reported as dolichocolon in the literature^[3,7,9].

Anatomic variations in length and position of the sigmoid colon and its mesocolon are closely related to an abundance of acute and chronic pathological conditions, sigmoid volvulus, severe confusions in radiological diagnosis and difficulties in the instrumentation of sigmoidoscopy and colonoscopy as well.

In some cases, the redundant loop of sigmoid colon may rotate around its narrow, extended mesocolon and provoke lymphovascular congestion and obstruction, followed by distension of the affected loop of the colon. When such an acute condition is encountered and the colon is viable, sigmoidoscopic decompression constitutes the treatment of choice, with potential efficiency in 40–90% of cases.

In addition, it is reported that a redundant loop of sigmoid colon may hinder both the instrumentation and diagnosis of imaging examinations. More specifically, the anomalous

course of the colon encumbers sigmoidoscopy, colonoscopy, barium enema radiographs and it also poses the potentiality of iatrogenic varicocele.

It is quite evident that a redundant loop of sigmoid colon is a subject of tremendous clinical significance for various clinicians, such as surgeons, obstetricians and radiologists. Hence, it is fundamental and crucial for them to be aware of this variation and to pay particular attention to the correlation between gross and clinical anatomy, since their awareness determines the outcomes of an operation and the accurate radiographic diagnosis. Finally, it is equally important for the physicians to emphasize to the embryology of redundant colon and to attain the identification of new genes that are related with intestinal development in order to earn information concerning congenital anomalies of the gut^[7]

In our study, we did not find any case of volvulus. Volvulus is a surgical emergency, may involve any segment of the colon, including the redundant loop but usually occurs in the caecum or sigmoid colon. It can be diagnosed via an abdominal CT scan .

Colonic duplication is a rare congenital anomaly that is often diagnosed in childhood, but sometimes may go unrecognised until adulthood. It may lead to abdominal pain and constipation. We had not found any case of colonic duplication in our study. When reviewed literature, Abdulla hasan^[10] reported a case of sigmoid duplication in a 33-year-old Indonesian woman. The author said clinical examination was unremarkable and radiological investigations raised the possibility of a giant colon diverticulum.

When we searched for rare congenital anomalies reported in literature, we found a unique case of coiled descending colon with persistent mesocolon and a straight sigmoid colon reported by Satheesha^[11]. The author reported that descending colon coiled below the level of kidney and shared common mesocolon with sigmoid and turned midline. In this case, sigmoid colon almost had straight course continuing with rectum.

In a case study of visceral variations in adult intestinal malrotation the frequency of malrotation in adults undergoing CT was 1/5,375. In our study we did not notice any case of malrotation^[12,13]

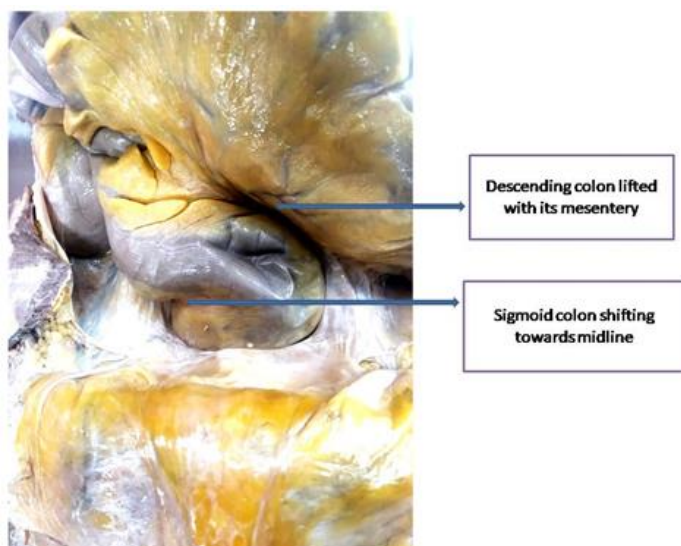


Figure 1 Descending colon lifted with its mesentery and sigmoid colon viewed from closeness

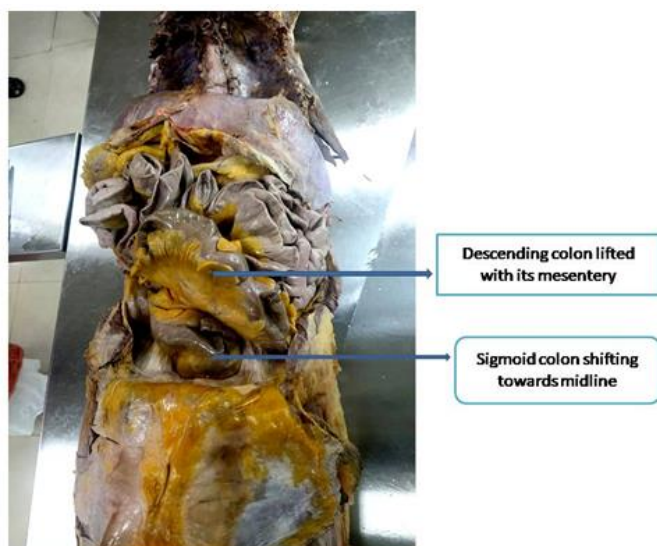


Figure 2 descending colon lifted with its mesentery and sigmoid colon viewed from distance

References

1. M. Zarokosta et al. / International Journal of Surgery Case Reports 46 (2018) 20–23
2. S.B. Nayak, B.M. George, S. Mishra, Abnormal length and position of the sigmoid colon and its clinical significance, Kathmandu Univ. Med. J. (KUMJ) 10 (October–December (40)) (2012) 94–97.
3. F.D. Larochelle, E.E. Smith, The dolichocolon, Radiology 18 (1932) 1111–1114.dolicho
4. R. Kanagasuntheram, L.S. Kin, Observations on some anomalies of the colon, Singapore Med. J. 11 (1970) 110–117.-classification
5. P. Shrivastava, A. Tuli, S. Kaur, S. Raheja, Right sided descending and sigmoid colon: its embryological basis and clinical implications, Anat Cell Biol 46 (December (4)) (2013) 299–302.
6. S.B. Nayak, N. Pamidi, S.D. Shetty, S.R. Sirasanagandla, S.S. Ravindra, A. Guru, N. Kumar, Displaced sigmoid and descending colons: a case report, OA Case Rep. 2 (December (17)) (2013) 166.
7. G. Indrajit, M. Sudeshna, M. Subhra, A redundant loop of descending colon and right sided sigmoid colon, Int. J. Anat. Var. (IJAV) 5 (2012) 11–13-dolicho
8. C.J. Chang, T.H. Hsieh, K.C. Tsai, C.M. Fan, Sigmoid volvulus in a young woman nearly misdiagnosed as fecal impaction, J. Emerg. Med. 44 (March (3)) (2013) 611–613.
9. M. Komiyama, Y. Shimada, A case of a right-sided sigmoid colon, Kaibogaku Zasshi. 66 (December (6)) (1991) 537–540.dolicho
10. Abdulla Hassan Al-Jarroof¹, Faisal Al-Zayer², Abdul-Wahed Nasir MeshikhesA case of sigmoid colon duplication in an adult woman <http://dx.doi.org/10.1136/bcr-2014-203874> - colon duplication
11. Satheesha Nayak B, Ravindra S Swamy, Ashwini Aithal P, Naveen Kumar. Coiled Descending Colon with Persistent Mesocolon and a Straight Sigmoid Colon – A Unique Congenital Anomaly. Online Journal of Health and Allied Sciences. 15:2:2016
12. Sukuru Şahin 1, Mehmet Ali Gedik .Visceral variations in adult intestinal malrotation: A case-series study. J Surg Med. 2020;4(7):597-599. DOI: 10.28982/josam.762738.

13. Chandrika Gurulingappa Teli*, Gnanagurudasan. Right Sided Sigmoid Colon –Rare Case. *Int J Biol Med Res.* 2012; 3(2): 1842-1844.