

Mobile Colon – A Developmental Anomaly of the Large Intestine

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Abstract

Introduction: Mobile Colon is a subtle developmental anomaly, which is due to the failure of the process of peritoneal zygotosis. The incidence of this anomaly is estimated to be 10-15% of the population. **Evidence Acquisition:** During routine cadaveric dissection of the abdomen in the Department of Anatomy, collective anomalies of the caecum, ascending colon and descending colon were found. In these collective anomalies cecum, ascending and descending colon instead of normally being retroperitoneal were suspended from the posterior abdominal wall by a fold of peritoneum called the mesentery. Mobile colon is an uncommon anomaly, which is being reported here. **Clinical Implications:** Mobile colon is usually asymptomatic but whenever it becomes symptomatic, it leads to mobile colon syndrome. Clinical symptoms associated with mobile colon syndrome mimic other common gastrointestinal disorders such as inflammatory bowel disease, malignancy, appendicitis and volvulus. Complications of this syndrome include intestinal obstruction, torsion of the intestine and gangrenous bowel which needs immediate treatment. **Conclusion:** Mobile colon syndrome should be considered in the differential diagnosis of chronic abdominal pain of obscure cause. Laparoscopic colopexy and cecopexy are recommended as therapeutic and diagnostic treatments.

Keywords: Large Intestine, Mobile Colon, Zygotosis

1. Introduction

Mobile colon is an uncommon congenital aberration. Embryogenesis of bowel is a complex process that begins in 5th week of intrauterine life. It involves three phases i.e. herniation, rotation and fixation¹. These phases are frequently associated with many embryological defects. During development, large colon is last to fused or fixed to posterior abdominal wall by process of zygotosis². Whenever there is failure of process of zygotosis and there is persistence of peritoneal fold (mesentery) along with cecum, ascending and descending colon and these become mobile instead of normally being retroperitoneal. This anomaly is called mobile colon. As such this condition is asymptomatic and found in 11.2% of autopsies¹. However,

sometimes it becomes symptomatic and presents with wide spectrum of symptoms called mobile colon syndrome. Clinical symptoms related to mobile colon mimic other common gastrointestinal disorders such as inflammatory bowel disease, malignancy, appendicitis and volvulus³. When untreated it leads to complications like intestinal obstruction, torsion and gangrenous bowel and these need immediate treatment⁴. In patients with symptomatic mobile colon syndrome, CT scan especially in trendelenburg position can be used for correct diagnosis. However Laparoscopy considered as main stay for diagnostic and therapeutic treatment. Cecopexy, colopexy along with appendectomy (sometimes) provides dramatic relief in carefully selected patients^{5,6}.

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2. Case Report

During routine under graduates and post graduates dissection of abdomen of 80 years old male cadaver in Department of Anatomy, mobile ascending colon, mobile descending colon along with mobile cecum were found (Figures 1 and 2). These parts were suspended from posterior abdominal wall through 15-18 cm wide mesentery. All of these were freely mobile instead of normally being retroperitoneal (Figure 3). Transverse colon was normal with greater omentum and transverse mesocolon. Duodenum was retroperitoneal, normally positioned. No abnormality detected in jejunum and ileum. There was no abnormality in blood supply of large and small intestine. No torsion or volvulus was there. Appendix 5cm long was normal with mesoappendix, pelvic 4o'clock in position. No sign of appendicular torsion or abscess. Blood supply to appendix was normal. Sigmoid colon was normal with sigmoid mesocolon and

rectum was retroperitoneal. No sign of diverticulitis. No lymph node enlargement in mesentery. No abnormality detected in rectum.

3. Discussion

Mobile colon syndrome is usually asymptomatic in adult. Symptoms may be present in childhood. Mobile cecum being common, present in 25% to 64% of cadavers^{7,8}.

4. Ethnicity

Incidence of mobile colon was significantly higher in western than in oriental subjects⁹.

5. Pathophysiology

Zygosis (fixation) leads to “retro peritonealisation” of certain intestinal segment¹¹. This process occurred in

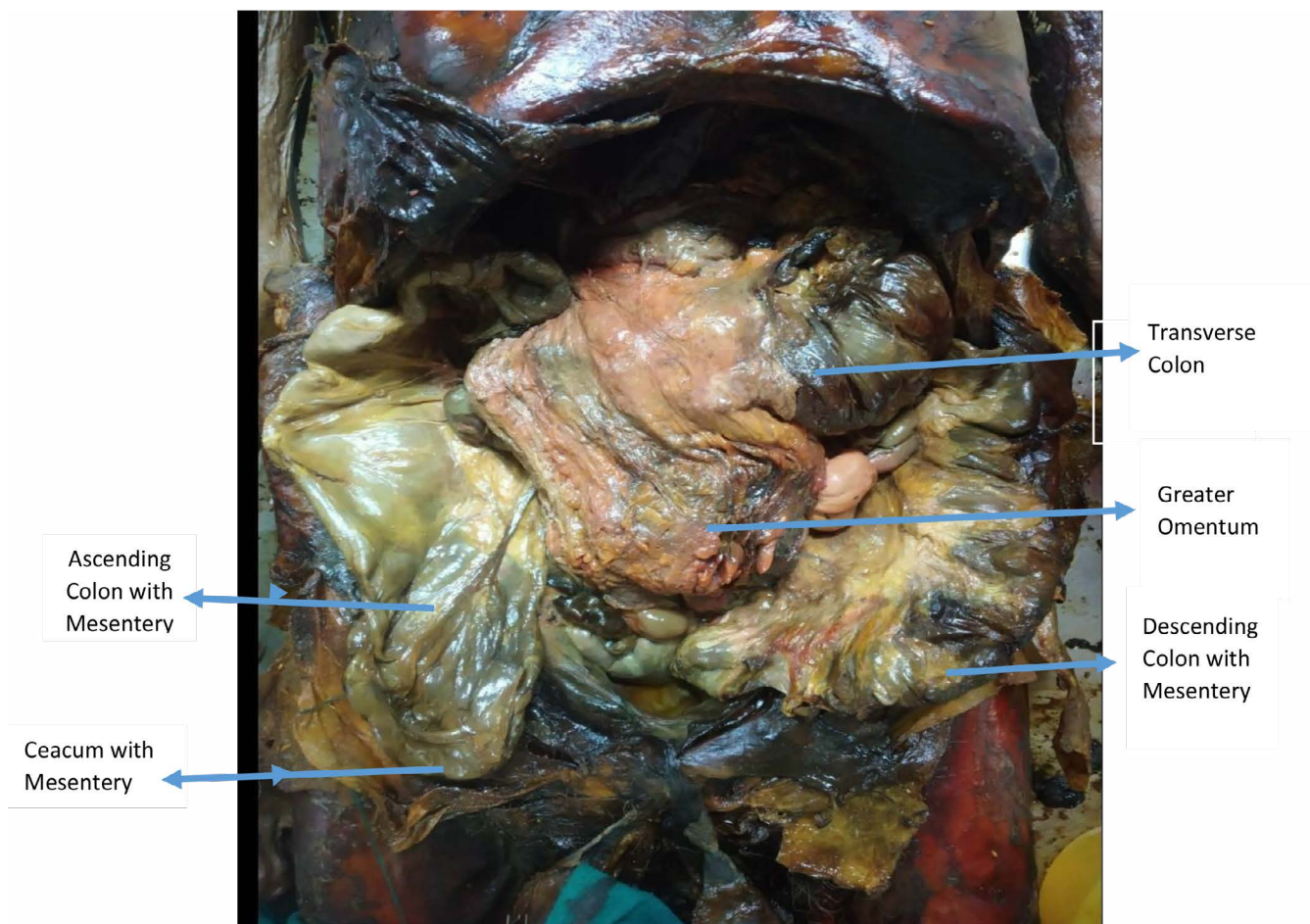


Figure 1. Showing position of Greater Omentum along with mobile Ascending, Descending colon and caecum.



Figure 2. Showing Mobile ascending, descending colon and caecum along with reflected coils of small intestine after removal of Greater Omentum.

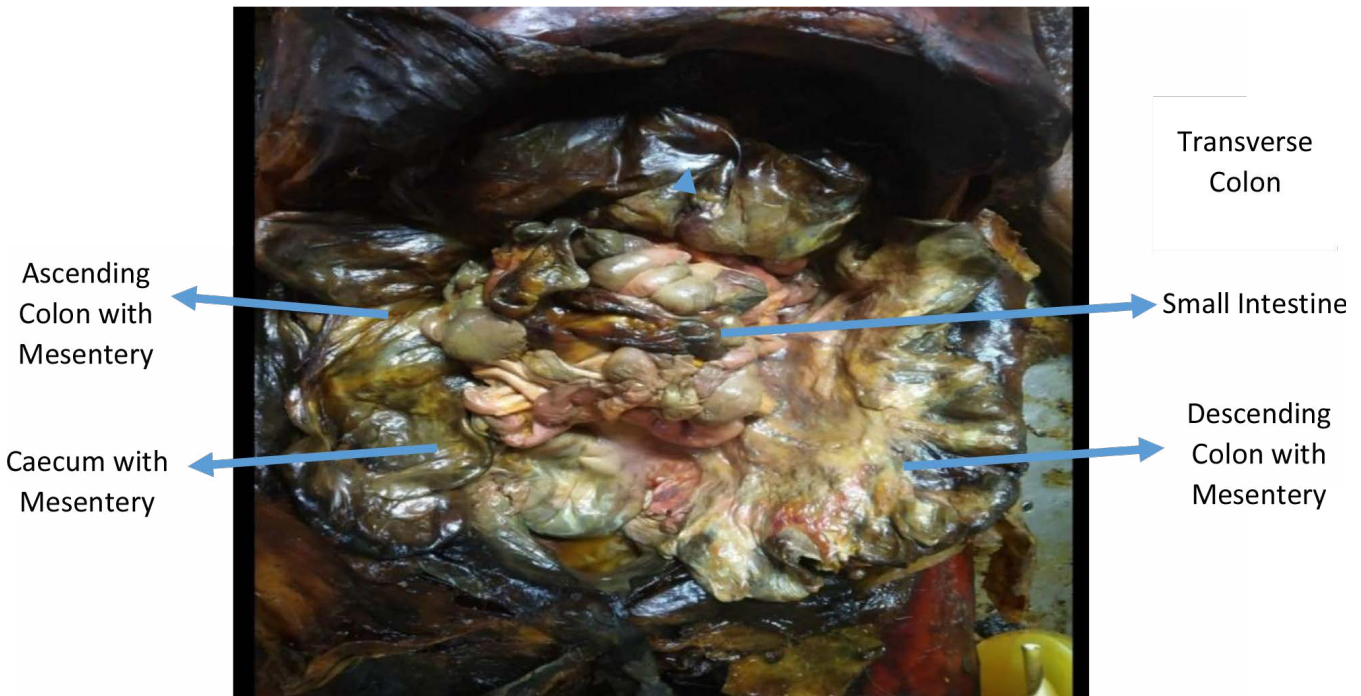


Figure 3. Showing Ascending and Descending colons with their Mesenteries.

anthropoid apes and in man due to upright position¹⁰. Mobile colon anomalies occurred because failure of zygosis in between one of stages of development⁴. Practically, it is considered that for water absorption in

right half of colon, antiperistalsis occur, which begins from the middle of transverse colon and progresses backward to cecum. This mechanism is for retention of heavy liquid faeces until there is adequate absorption

of water. This load when carried by abnormally mobile colon causing discomfort of variable degree to patients in upright position. When retroperitoneal, ascending colon and cecum remain in straight, but when mobile, it tends to sink downward and become tortuous. The peristalsis has to drive the intestinal content uphill against the resistance imposed by kinks in the tube^{11,12}.

6. Clinical Implications

Only few patients are symptomatic and severity depends upon many factors. These include degree of abnormality, inherited strength or weakness of tissue fibre, relative ability of people to stand pain or discomfort, occupation, proper or improper position and intestinal stasis. The differential diagnosis of mobile colon is only made by elimination of the other clinical entities with simulating symptoms². Symptomatic patients mostly present with recurrent abdominal pain and distension which worsen by constipation and exercise and usually relieved with passing gas or following bowel movements^{13,14}. Some authors classified symptoms into three stages: In first stage, there was recurrent intermittent pain/mobile colon syndrome and acute obstruction i.e. tolerable, second stage consisted of acute obstruction with complication of perforation and in third stage patients had intolerable abdominal pain, guarding, rigidity and tympanic abdomen referred as acute abdomen and it's a surgical emergency. 10-20% of population with mobile colon syndrome presents with volvulus and appendicitis like symptoms³. Symptoms of mobile colon syndrome mimic other gastrointestinal disorders like IBS, malignancy, Appendicitis and volvulus. Presence of mobile colon with mobile cecum predispose to midgut volvulus as well as knotting by ileum and appendix¹⁵. Laparoscopy provides a thorough exploration of entire abdomen especially in case of inconclusive radiological reports. It offers diagnostic and therapeutic benefits by colopexy and cecopexy^{16,17}. In case of torsion or gangrene colon will be treated by colectomy. Waugh¹⁸ reported 80% improvement and cure with colopexy. Carslow¹⁹ reported cure in 71% and Houston¹¹ found satisfactory results with colopexy. Brook¹⁶ reported 63% cure with colopexy. Some authors suggested associated appendicectomy with colopexy and cecopexy increases the fixation to parietal peritoneum due to post appendicectomy adhesions²⁰⁻²². At last, treatment should be tailored and based on patient's performance

status, viability of the bowel, risk of procedure and surgeon's skill in laparoscopic procedure^{23,24}.

7. Conclusion

Mobile colon and associated syndrome is difficult to diagnose pre-operatively. Diagnosis of mobile colon syndrome should be considered as differential diagnosis only after ruling out other causes. Laparoscopic colopexy and cecopexy is main stay of treatment. Prompt diagnosis and management may allow for preventive manoeuvres to salvage bowel in symptomatic patients.

8. References

1. Cesaretti M, Trotta M, Leale I, et al. Surgery to treat symptomatic mobile caecum syndrome is safe and associated with good recovery outcomes. *Case Reports in Gastro Med.* 2018; 2018: 4718406. PMID: 29593915 PMCid: PMC5822757. <https://doi.org/10.1155/2018/4718406>
2. Bains L, Gupta A, Kaur D, et al. Mobile right colon syndrome: Obscure cause of lower right abdominal pain. *Ann Colorectal Res.* 2016; 4(2): e35527. <https://doi.org/10.17795/acr-35527>
3. Reddy PSY, Kumaran SS, Vanka V, et al. Abdominal pain - A common presentation with unusual diagnosis: A case report. *J of CommunhospInt Med Persp.* 2010; 10(6): 604–8. PMID: 33194140 PMCid: PMC7599011. <https://doi.org/10.1080/20009666.2020.1821469>
4. Mazingi D, Mbanje C, Muguti IG, et al. Volvulus of the ascending colon due to failure of zygois: A case report and review of the literature. *Int J of Surg Case Rep.* 2019; 59:90–3. PMID: 31125788 PMCid: PMC6531863. <https://doi.org/10.1016/j.ijscr.2019.05.014>
5. Jean JY, Tseng HH, Kao WS, et al. An unusual presentation of Acute Appendicitis with mobile caecum syndrome. *Ped and Neonatol.* 2015; 56:205–6. PMID: 25943697. <https://doi.org/10.1016/j.pedneo.2015.01.007>
6. Yamamoto T, Tajima Y, Hyakudomi R, et al. Case of colonic intussusception secondary to mobile cecum syndrome repaired by laparoscopic cecopexy using barbed wound suture device. *World J of Gastroenterol.* 2017; 23(35):6534–9. PMID: 29085202 PMCid: PMC5643278. <https://doi.org/10.3748/wjg.v23.i35.6534>
7. Consorti ET, Liu TH. Diagnosis and treatment of Caecal Volvulus. *Postgrad Med J.* 2005; 81:772–6. PMID: 16344301 PMCid: PMC1743408 <https://doi.org/10.1136/pgmj.2005.035311>
8. Solanke TF. Intestinal obstruction in Ibadan. *West Afr Med J Niger Pract.* 1948; 17:191–3.

9. Saunders BP, Maraki T, Sawada T, et al. A preoperative comparison of western and oriental colonic anatomy and mesenteric attachments. *Int J of Colorectal Dis.* 1995; 10:216–21. PMID: 8568407. <https://doi.org/10.1007/BF00346222>
10. Straus WL. The thoracic and abdominal viscera of primates, with special reference to the orangutan. *Proc Am Philos Soc.* 1936; 76(1):1–85.
11. Frazer JE, Robbins RH. On the factors concerned in causing rotation of intestine in man. *J Anat Physiol.* 1915; 50:75–110.
12. Houston WR. The Mobile Right Colon. *J Am Med Assoc.* 1929; 93(10):766–8. <https://doi.org/10.1001/jama.1929.02710100028011>
13. McConnell AA, Hardman T. Abnormalities of fixation of the ascending colon: The relation of symptoms to anatomical findings. *Br J Surg.* 1923; 10(40):532–57. <https://doi.org/10.1002/bjs.1800104014>
14. McConnell AA. Mobile ascending colon and duodenal obstruction a common causes of equivocal symptoms in the abdomen. *Ir J Med Sci.* 1921; 2:389–403. <https://doi.org/10.1007/BF02974958>
15. Gebresellassie WH. Ileocecal Knotting in a young man with Mobile Cecum and ascending colon: A very rare and unique cause of intestinal obstruction. *Clinical Case Reports.* 2020. <https://doi.org/10.22541/au.159050493.30770142>
16. Brooks L. Mobile Right Colon: Clinical Consequences. *Cal West Med.* 1937; 46(1):14–20. [PubMed: 18743908].
17. Dixon CF, Meyer AC. Volvulus of the caecum. *Surg Clin North Am.* 1948; 28:953–63. (Mayo clinic Number). [PubMed: 18878458]. [https://doi.org/10.1016/S0039-6109\(16\)32484-7](https://doi.org/10.1016/S0039-6109(16)32484-7)
18. Waugh GE. The morbid consequences of a mobile ascending colon, with a record of 180 operations. *Br J Surg.* 1919; 7(27):343–83. <https://doi.org/10.1002/bjs.1800072708>
19. Carslaw RB. Right-sided visceroptosis: An estimate of the importance of abnormal mobility and prolapse of the ascending colon and caecum in the causation of various abdominal conditions, based on observations in a series of 242 cases treated by right colopexy. *Br J Surg.* 1928; 15(60):545–604. <https://doi.org/10.1002/bjs.1800156004>
20. Ris HB, Stimemann H, Doram JE. The mobile caecum syndrome and ceacopexy or only appendectomy? *Chirurg.* 1989; 60:277–82.
21. Makama JG, Ahmed A, Ukwenya Y, et al. Mobile Cecum and ascending colon syndrome in a Nigerian adult. *Ann of Afr Med.* 2009; 8(2):133–5. PMID: 19805946. <https://doi.org/10.4103/1596-3519.56243>
22. Tsushimi T, Kurazumi H, Takemoto Y, et al. Laparoscopic cecopexy for mobile caecum syndrome manifesting as caecal volvulus: Report of a case. *Surg Today.* 2008; 38(4):359–62. PMID: 18368329. <https://doi.org/10.1007/s00595-007-3620-7>
23. Fung AT, Konkin DE, Kanji ZS. Malrotation with Midgut volvulus in an adult: A case report and review of the literature. *J Surg Case Reports.* 2017; 5:1–3. PMID: 28560023 PMCID: PMC5441244. <https://doi.org/10.1093/jscr/rjx081>
24. Printer KJ. Mobile cecal syndrome in adults. *Am Surg.* 1976; 42(3):204–5.

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