

Mobile Right Colon Syndrome: Obscure Cause of Lower Right Abdominal Pain

Lovenish Bains,^{1*} Amit Gupta,¹ Daljit Kaur,² and Aman Batish³

¹Institute-Department of Surgery, Dr BSA Medical College and Hospital, New Delhi, India

²Institute-Max Super Speciality Hospital, Dehradun, India

³Institute-Department of Surgery, Maulana Azad Medical College, New Delhi, India

*Corresponding author: Lovenish Bains, Institute-Department of Surgery, Dr BSA Medical College and Hospital, New Delhi, India. Tel: +91-9910777700, E-mail: lovenishbains@gmail.com

Received 2015 December 14; Revised 2016 May 18; Accepted 2016 June 12.

Abstract

Context: The mobile right colon is a developmental aberration. During the development and rotation of the gut, the cecum and ascending colon are the last to take their final position and fuse with the posterior abdominal wall.

Evidence Acquisition: Though a mobile right colon may be present in 20% - 30% of the population but causes symptoms in very few. The patients present intermittent colicky right lower quadrant abdominal pain with associated abdominal distention and symptomatic relief after passing flatus or having a bowel movement.

Results: Non fixation along with heavy load of the right colon drags the cecum and ascending colon down and leads to stasis, obstruction or volvulus. The diagnosis of this entity is very difficult as radiological studies are not conclusive.

Conclusions: The mobile colon syndrome should be considered in the differential diagnosis of right lower quadrant pain from obscure causes. A proper detailed history is a must to consider this as differential diagnosis. Laparoscopy offers diagnostic and therapeutic treatment. Colopexy provides dramatic relief in carefully selected patients.

Keywords: Mobile Right Colon, Stasis, Obstruction, Colopexy

1. Context

The mobile right colon is a developmental aberration. During the development and rotation of the gut, the cecum and ascending colon are the last to take their final position and fuse with the posterior abdominal wall. The patient presents intermittent colicky right lower quadrant abdominal pain with associated abdominal distention and symptomatic relief after passing flatus or having a bowel movement. Non fixation along with heavy load of the right colon drags the caecum and ascending colon down and leads to stasis, obstruction or volvulus. The diagnosis of this entity is very difficult as radiological studies are not conclusive. The mobile right colon or non-fixation of the ascending colon is a definitive abnormality, which may result in acute colonic volvulus on one hand or its chronic counterpart on the other hand (1).

The mobile right colon syndrome is a rare congenital abnormality that presents symptoms commonly during childhood with features of intestinal obstruction. The syndrome is primarily a disease of children, its presentation in adulthood is relatively rare (2, 3). It is characterized by chronic right lower quadrant pain with evidence of neither appendicitis nor other pathological findings at operation (4). Abnormal mobility of the caecum and ascending

colon has been estimated to occur in 10% - 20% of the population (3-5). Wolfer et al. (6) described the defective peritoneal fixation of the ascending colon and cecum in 10% of the population. A cadaver study revealed an 11% incidence of freely mobile right colon and a 26% incidence of cecal mobility, sufficient to cause symptoms (7). Another report found very little lateral mobility in 92% of the patients. The ascending colon was practically straight in 82%, and in 18% there were one or more flexures in its course (8).

2. Evidence Acquisition

Only a few patients are symptomatic. An explanation of this would probably involve the degree of abnormality, the inherited strength or weakness of the tissue fibre, the relative ability of people to stand pain or discomfort, abnormal relationship of the adjacent organs from lack of uniform ptosis, stress and strain, occupation, proper or improper nourishment, stability or instability of the autonomic nervous system, the upright position and intestinal stasis (8, 9).

The mobile right colon is not as rare nor as benign as was use to believe (2, 3, 5-10).

3. Results

3.1. Pathophysiology

Embryologically during the development and rotation of the gastrointestinal tract, the cecum and ascending colon are the last to take their final position. Normally, the ascending colon fuses with the posterior abdominal wall and is broadly attached in the right lumbar region. This rotation and fusion process may vary, from failure of rotation, to abnormal mobility of varying degrees, up to axial rotation of 90 to 120 degrees, with partial obstruction. Along with the lack of normal fixation, abnormal, congenital or developmental bands are prevalent.

It has been emphasized that practically all water is absorbed from the right half of the colon, and also that normally antiperistalsis occurs, which begins about the middle of the transverse colon and progresses backward to the cecum, a mechanism for retention of the heavy liquid faeces until the water has been absorbed. With an abnormally mobile cecum, with a narrow attached mesentery or congenital bands attached to the viscera or to the parietal peritoneum, this load must be carried by such structures while the patient is in an upright position causing discomfort to variable degree and volvulus of proximal colon (9-11).

This abnormality is the result of failure of the right colonic mesentery to fuse with the lateral peritoneum. The ascending colon by its fixation to parietal peritoneum, is maintained in a vertical position essentially as a straight tube with some curves. Whenever the fixation is absent, it tends to sink downwards and become a tortuous tube. The peristalsis has to drive the intestinal content up-hill, against the resistance imposed by kinks in the tube, and also by the weight of the ascending colon (10, 11). Mobile caecum and ascending colon, and fixation at a point (a fulcrum about which torsion may occur) are said to be major pre-requisites for volvulus in such patients (5, 8-11).

3.2. Presentation

The usual presentation is intermittent right lower quadrant cramping pain for months (2, 3, 8-10). Common symptoms include colicky pain and abdominal distension, usually relieved by passing flatus, stool, or with an enema (3, 4, 6). In acute cases, the patient may have right lower quadrant pain with tenderness over McBurney's point and hyperactive high-pitched bowel sounds. After the attack, the patient becomes asymptomatic (2, 8-10).

The onset of symptoms depends upon the onset of stasis, which most commonly occurs around the age of puberty. The location of the pain or discomfort varies in different patients; the type and location of the pain is remarkably constant in a given patient, but the time and duration of the pain are most erratic. It may be present for

one or several days, then mysteriously disappear for a day or more, only to recur exactly in the same place and to be always of the same type. The most characteristic feature of the history is this erratic "constant inconstancy" of the symptoms. The patient will often be relieved by cathartics and enemas, or upon assuming the reclining position (8-10).

The right lower quadrant pain is the most common, dragging or aching due to over distension of the cecum, or traction of congenital bands, which becomes worse with constipation or exercise, relieved by cathartics and bed rest. It is found in patients, who have more or less normal fusion of the hepatic flexure of the colon, but with lack of fusion of the cecum and a varying amount of the ascending colon. The gastric symptoms predominate when the hepatic flexure is not fixed, and the pyloric end of the stomach and duodenum are dragged downward with the load of the heavy right colon. This type may have pain in both right and left upper quadrant, indigestion, loss of weight, and abundance of gaseous eructations. If abnormal congenital bands are attached to the colon and gall-bladder, then symptoms referable to this region can be elicited.

The baffling symptoms with recurrent pain in the right lower abdominal quadrant may sometimes be associated with a palpable but fleeting ballotable tumescence, which has been referred to as a "phantom tumor" (12, 13).

Physical examination of these patients does not furnish diagnostic aid comparable to that furnished by their history (2, 3, 6, 8-10). The patient may undergo appendectomy because of chronic right lower quadrant pain but symptoms do not improve postoperatively. A few have undergone laparotomy in impression of partial intestinal obstruction (4).

3.3. Diagnosis

A right lower quadrant abdominal pain caused by a symptomatic right mobile colon is usually never a primary nor even a differential diagnosis. The differential diagnosis is made by elimination of the other clinical entities with simulating symptoms. A proper detailed interpreted history is compulsory to arrive at a tentative diagnosis. It should be kept in mind that since an abnormally mobile right colon is often present without producing any symptoms, it is very difficult to diagnose it accurately.

The diagnosis is difficult to make because despite proximal colon mobility, they usually reside in a normal anatomic position. As a result, radiological investigations do not reveal any abnormality (6).

However X-rays, computed tomography in acute scenarios, point to intestinal obstruction or volvulus. X-rays show absence of gas in the usual position of the right colon

or large air filled viscus in the left abdomen due to twisting or volvulus (Figures 1 and 2). This is valuable in determining the stasis, level of obstruction and to rule out other pathology. Barium enema may demonstrate abnormal mobility of the right colon (3). Positional contrast enema with barium or gastrografen aided by radiologist's zeal to roll the patient on the table may show a contrast filled right mobile colon drooping medially or towards the pelvis in the right lateral position. The relief of pain and discomfort of the patient during the procedural positioning is itself diagnostic and therapeutic by detorsion of a kinked bowel (14).



Figure 1. Absence of Gas on the Right Side With Hugely Dilated Colon

Colonoscopy is not helpful as it may reduce and reposition a torsed or ptosed right colon.

3.4. Management

Diagnostic laparoscopy is a valuable aid in diagnosis and therapy for chronic pain in the right iliac quadrant with an advantage of minimal invasiveness. It provides a thorough and methodical exploration of the entire abdominal cavity, especially in cases of recurrent pain with inconclusive radiological reports (14, 15). On exploration, patients have been found to have the cecum and ascending colon unattached to the lateral peritoneum for 15 to 18 cm

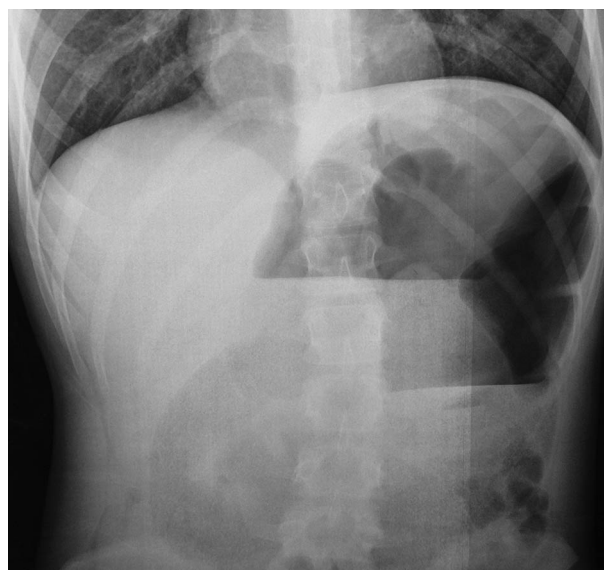


Figure 2. A Large Air-Filled Viscus Due to Volvulus of the Right Colon

(3). Laparoscopy offers diagnostic and therapeutic benefits by colopexy (14-16).

The traditional treatment involves division of congenital bands involving the cecum or ascending colon and fixation of the right colon to the lateral peritoneum. This can be accomplished laparoscopically in the present era (15, 16). The gangrenous colon will warrant right colectomy. The simple colopexy, by English surgeon, Waugh (17), relieves tension on the mesentery and offers symptomatic relief. A space is made in the lumbar region for the ascending colon and edge of the fascia is sutured to the ascending colon.

Cecopexy or colopexy, using lateral peritoneal flap, first described by Dixon and Meyers (18) in 1948 is the surgical technique of choice. This technique has stood the test of time and best attains fixation of the caecum. Firstly, the peritoneum lateral to the unattached portion of the colon is incised. A flap of peritoneum is then carefully raised, with care being taken not to injure any retroperitoneal structure. The caecum and ascending colon are placed under the peritoneal flap and the free edge at the flap is sutured to the tenia coli using interrupted non-absorbable sutures. The colon is thereby fixed partially to the retroperitoneum (18)

The largest series reports of colopexy have been published during the earlier half of 19th century with isolated cases in the latter half. In 1919, Waugh (17) reported 518 cases with cures between 75% and 80%, improvement in about 12%, and failures in 8% to 10%. Carslaw studied (19)

242 cases over seven years and reported a cure in 70.7% of the cases, much improvement in 18.4%, and failures in 10.9%. Ten of his patients had previously been appendectomized without relief, and were completely cured by the colopexy. Similar results were reported by McConnell and Hardman (10). Houston performed 145 colopexies and stated that the results were far more than satisfactory results (9). Out of the sixty-nine cases, Brooks (8) reported sixty-three, who are relieved of the abdominal symptoms of which they complained; four are very much improved and two are failures.

Various series have reported satisfactory outcomes if the diagnosis was established on properly evaluated history, absence abdominal findings or corroborative radiological findings (8-10, 14-20).

4. Conclusions

The mobile colon syndrome should be considered in the differential diagnosis of right lower quadrant pain from obscure causes. A proper detailed history is a must to consider this as differential diagnosis and should be made the diagnosis of exclusion. The mobile right colon or non-fixation of the ascending colon is a definitive abnormality, which may result in acute colonic volvulus on one hand or its chronic counterpart on the other hand. Many troublesome patients may fall in this group, and can be cured by fixing the right sided colon in its normal position. Since radiological studies do not provide proper evidence, diagnostic laparoscopy should be utilised in right lower abdominal pain of obscure etiology for its therapeutic benefits. Colopexy may provide dramatic relief to most of cases.

Footnotes

Authors' Contribution: Lovenish Bains conceived the manuscript, acquisition of the information, drafted the manuscript with revisions. Daljit Kaur and Aman Batish participated in the drafting of the manuscript and acquisition of the information. Lovenish Bains and Amit Gupta participated in the critical revision of the manuscript for important intellectual content. All authors read and approved the final manuscript.

Funding/Support: The author(s) also declare that no funding in any form was received related to the content of the manuscript and there were no financial competing interests.

References

- Ingelfinger FJ. Intermittent Volvulus of the Mobile Cecum. *Arch Surg.* 1942;**45**(1):156-63.
- Printen KJ. Mobile cecal syndrome in the adult. *Am Surg.* 1976;**42**(3):204-5. [PubMed: [1259253](#)].
- Rogers RL, Harford FJ. Mobile cecum syndrome. *Dis Colon Rectum.* 1984;**27**(6):399-402. [PubMed: [6734364](#)].
- Lee YJ, Lee YA, Liu TJ, Chang TH. Mobile cecum syndrome: a report of two cases. *Zhonghua Yi Xue Za Zhi (Taipei).* 1996;**57**(5):380-3. [PubMed: [8768389](#)].
- Makama JG, Ahmed A, Ukwanya Y, Mohammed I. Mobile caecum and ascending colon syndrome in a Nigerian adult. *Ann Afr Med.* 2009;**8**(2):133-5. doi: [10.4103/1596-3519.56243](#). [PubMed: [19805946](#)].
- Wolfer JA, Beaton LE, Anson BJ. Volvulus of the cecum. Anatomical factors in its etiology: Report of case. *Surg Gynecol Obstet.* 1942;**74**:882-94.
- Ballantyne GH, Brandner MD, Beart RJ, Ilstrup DM. Volvulus of the colon. Incidence and mortality. *Ann Surg.* 1985;**202**(1):83-92. [PubMed: [4015215](#)].
- Brooks L. Mobile Right Colon: Clinical Consequences. *Cal West Med.* 1937;**46**(1):14-20. [PubMed: [18743908](#)].
- Houston WR. The Mobile Right Colon. *J Am Med Association.* 1929;**93**(10):766-8.
- 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.
- McConnell AA. Mobile ascending colon and duodenal obstruction as common cause of equivocal symptoms in the abdomen. *Ir J Med Sci.* 1921:389-403.
- Tirol FT. Recurrent cecal volvulus. Phantom tumors. *Abdm Surg.* 1998:12-3.
- Tirol FT. Recurrent cecocolic torsion: radiological diagnosis and treatment. *JSLs.* 2003;**7**(1):23-31. [PubMed: [12722995](#)].
- Caiazzo P, Esposito M, Del Vecchio G, Papparella A, Cavauiolo S, Tramutoli PR, et al. The role of laparoscopy in recurrent right lower quadrant pain in children. *Ann Ital Chir.* 2015;**86**(1):42-5. [PubMed: [25819837](#)].
- Tsushimi T, Kurazumi H, Takemoto Y, Oka K, Inokuchi T, Seyama A, et al. Laparoscopic cecopexy for mobile cecum syndrome manifesting as cecal volvulus: report of a case. *Surg Today.* 2008;**38**(4):359-62. doi: [10.1007/s00595-007-3620-7](#). [PubMed: [18368329](#)].
- Bhandarkar DS, Morgan WP. Laparoscopic caecopexy for caecal volvulus. *Br J Surg.* 1995;**82**(3):323. [PubMed: [7795996](#)].
- Wagh GE. The morbid consequences of a mobile ascending colon, with a record of 180 operations. *Br J Surg.* 1919;**7**(27):343-83.
- Dixon CF, Meyer AC. Volvulus of the cecum. *Surg Clin North Am.* 1948;**28**(Mayo Clinic Number):953-63. [PubMed: [18878458](#)].
- Carlsaw RB. Right-sided visceropexy: 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.
- Aynesworth KH. Pathological consequences of the congenitally ptosed right colon: Surgical treatment in selected cases. *Am J Surg.* 1929;**7**(3):358-68.