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Original Research Paper

Acute Caecal Volvulus : A Surgical Challenge

Surgery

KEYWORDS :acute caecal Volvulus, acute Intestinal obstruction, diagnosis, surgery.

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ABSTRACT

Acute Caecal Volvulus (ACV) is a rare cause of acute intestinal obstruction which is axial rotation of caecum, ascending colon and terminal ileum around their mesenteric pedicles. In this study, 11 cases of Acute Caecal Volvulus out of 402 cases of intestinal obstruction admitted in MGM Medical College & Hospital, Jamshedpur between January,2011 and November, 2015 were taken into consideration. The clinical findings were those of low small bowel obstruction. Due to its rarity and non specific presentation , preoperative diagnosis is difficult. Diagnosis was achieved by plain abdominal films in some of the cases (45.45%). CT scan abdomen is more accurate in the diagnosis of this rare disease. Diagnosis of most of the cases(54.54%) were done at operation due to similarity with acute small bowel obstruction. One patient died due to delayed arrival to the hospital leading to subsequent gangrene of caecum and peritonitis. No death occurred in the group with viable caecum. When gangrenous caecum is present, resection with right hemicolectomy and primary ileocolic anastomosis is the treatment of choice. In the absence of gangrenous bowel (viable caecum), caecopexy is recommended. The aim of this study is to keep Acute Caecal Volvulus at the back of the mind of the attending surgeon while dealing with cases of acute intestinal obstruction.

Introduction

Volvulus is abnormal rotation of any part of gastro-intestinal tract along with vascular compromise that leads to intestinal obstruction, gangrene , perforation and peritonitis. It may arise in the sigmoid colon, caecum, splenic flexure and in transverse colon in descending order of frequency (Madiba TE, et al 2002 and Valsdottir E et al 2008.). Therefore, Acute Caecal Volvulus (ACV), as an uncommon cause of acute intestinal obstruction , is the axial twist of the caecum, ascending colon and terminal ileum around their mesenteric pedicles (Majeski J, et al 2005). Caecal bascule is a variant of this condition associated with the upward folding of the caecum and ascending colon either anteriorly or posteriorly without an axial twist and accounts for about 10% of all caecal volvulus cases (Madiba TE, et al 2002). Caecal Volvulus presentation is quite confusing and cannot be differentiated from small intestinal obstruction in acute cases. Fulminant cases present with the signs of peritoneal irritation and haemodynamic instability.

According to several studies, ACV accounts for 10-60% of all colonic volvulus (Madiba TE, et al 2002; Valsdottir, E et al 2008: Consorti, ET, et al 2005 and Lau, KC 2006) out of which 90% accounts for loop axial ileocolic volvulus and the remaining 10% are bascule. Anticlockwise rotation is more common (Mustafa, H et al 2012). ACV is found more commonly in females (Female:Male ratio - 1.4 :1). Mean age was 35+5 years.

The current study was planned to review the clinical features of Acute Caecal Volvulus to make emergency surgeons aware of this uncommon condition by keeping a high index of suspicion in all cases of intestinal obstruction with or without peritonitis.

Material and Methods

The study was carried out in 402 cases of intestinal obstruction admitted to the Surgical Emergency Department of MGM Medical College & Hospital, Jamshedpur between January, 2011 and November, 2015.

Out of 48 Patients, presented with colonic volvulus, only 11 cases were diagnosed acute caecal volvulus. In this study, 7 cases presented with gangrenous caecum on laparotomy and in the remaining 4 cases caecum was found viable. Surgical decision making regarding choice of surgical procedure depended upon the presence of gangrenous gut, time of presentation following onset of obstructive features, extent of proximal dilatation, comorbidities and surgeon's preference.

Pre operative diagnosis of ACV was done by abdominal radiographs in some of the cases though CT scan was found more accurate.

In patients with gangrenous caecal volvulus, 6 underwent Right Hemicolectomy and ileo-colic anastomosis and remaining 4 cases were treated by Caecopexy. 1 case was treated by Right hemicolectomy and ileocolic anastomosis with loop ileostomy.

Ileocolic anastomosis were done with single layer continuous 3-0 Vicryl sutures. All laparotomies incision were done through midline and closure of abdomen was done in all cases with single layer continuous No.1 Vicryl sutures. Skin was closed with Prolene (No.-1) sutures.

Observations

Out of 11 cases of ACV , 4 (36.36%) were males and 7 (63.63%) were females. 81% cases were in the age group of 35 to 40 years whereas remaining 20% were in the age group of 41 to 45 years.

Table No. 1 : Demography

AGE	FEMALE	MALE	TOTAL
35-40	5(45.45%)	4(36.36%)	9 (81.81%)
41-45	2(18.18%)	0(00.00%)	2 (18.18%)

Mean age group was 37years.

Average duration of presentation following onset of obstructive symptoms was 3.5 days (range 2 to 6 days).

The differential clinical features of acute CV in relation to other causes of intestinal obstruction showed more occurance of right lower quadrant pain, abdominal distension, nausea , vomiting and right lower quadrant mass (Table – 2).

Table-2 : Distinctive features of Acute CV in comparison to the other causes of intestinal obstruction –

Clinical Features	Acute CV	Intestinal obstruction
Intermittent colicky pain in Right Lower Quadrant	54%	6%
Severe colicky pain periumbilical	20%	80%

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General abdominal distension	40%	82%
Right hemi abdominal distension	60%	14%
Palpable mass in Right Lower Quadrant	38%	8%
Constipation	12%	30%
Vomiting	55%	35%
Previous Surgery	45%	42%

Presence of comorbidities is documented in Table-3

Table 3 : Comorbidity profile of Patients presenting with ACV

Previous Abdominal Surgery	05 (45.45%)
Mobile Caecum	04 (36.36%)
Chronic constipation	01 (09.09%)
Prolonged Immobility	01 (09.09%)

The patients were managed by either Right Hemicolectomy with Ileo-colic anastomosis or Caecopexy (in viable caecum) or Right Hemicolectomy + Iliocolic anastomosis + iliostomy operations. Caecopexy was done by raising a lateral peritoneal flap along the entire length of the ascending colon and suturing the flap to the serosa of the anterior colonic wall by keeping ascending colon retroperitoneal partially and eliminating the excess mobility.

Table-4 : Management Options

PROCEDURE OFFERED	NUMBER OF PATIENTS
Right Hemicolectomy + Ileocolic Anastomosis	6 (54.54%)
Caecopexy	4 (36.36%)
Right Hemicolectomy+Ileocolic Anastomosis + loop ileostomy	1 (09.09%)

Outcome was analysed in all 3 groups by assessing complications and mortality : Table-5

Table-5 : Outcome following surgery

OUTCOME	Gangrenous Gut		Viable Gut
	Right Hemi + Ileocolic Anast	Right Hemi + Ileocolic Anastomosis+ loop Ileostomy	Caecopexy
Wound Infection	1(09.09%)	1 (09.09%)	0
Anastomotic leak	2 (18.18%)	0	0
Wound Dehiscence	1 (09.09%)	0	0
Mortality	1 (09.09%)	0	0

Postoperatively, 2 (18.18%) cases developed wound infection , 2 (18.18%) patients developed anastomotic leak and 1 (09.09%) patient suffered wound dehiscence . The mortality was 09.09% (1 case) due to delayed arrival with severe gangrene, perforation and peritonitis of the ACV.

The cases are followed up till date and no recurrence has been reported yet.

Discussion & Results

Acute Caecal volvulus is the second commonest type of colonic volvulus after sigmoid. Katoh T, et al (2009) reported caecal volvulus as a rare cause of intestinal obstruction. Acute Caecal volvulus is found in 2.73% cases of intestinal obstruction in this study which is comparable to other studies (Rabinovici R, et al 1990).

A study reported that there is variability of peak age of presentation in different geographical areas, as in India it is 33 years compared to 53 years reported in western countries (Tezler G, et al 1988) . Mean age of 37 years is observed in this study and female preponderance (63.63%) is similar to other studies (Yung SH, et al 2000). Patient age at presentation is presumably affected by cultural and dietary influences and their effects on intestinal motility in different areas (Peterson CM, et al 2009).

Defective peritoneal fixation of the ascending colon and caecum in 10% population was observed in one of the studies (Wolfer JA, et al 1942). This fixation permits abnormal mobility of the ascending colon and caecum, making displacement of the right colon into any part of the abdominal cavity. Depending on the length of the mobile ascending colon, a variety of obstructive bowel patterns may result. Tezler G, et al 1988 described an association with adhesions, membranes and bands, which may provide a nodal point around which the mobile ascending colon may twist. Both hyper mobile caecum (in 36.36% of cases) and adhesions of previous surgeries (in 45% of cases) were present in this study.

There were cases which were indifferentiable from small bowel obstruction or had peritonitis. In this study pain was the main symptom followed by the abdominal distension in accordance with an early study (Consorti ET, et al 2005). Intermittent colicky pain in Right lower quadrant was reported by 54% patients in this study compared to 6% in other causes of small intestinal obstruction. Severe periumblical colicky pain was observed in small intestinal obstruction (80%) compared to acute caecal volvulus (20%). Second leading symptom was abdominal distension in this study which was more common in the right hemi abdomen (60%) , with palpable mass also in some cases (38%). Vomiting was seen in 55% of cases and usually appeared earlier whereas Constipation was less frequent and they appeared late .

Laboratory investigations are neither specific nor sensitive for the diagnosis of acute CV. In advanced cases of obstruction and gangrene , fever and leucocytosis were observed.

Plain abdominal radiography and computed tomography (CT) scanning are the preferred examinations. But in this study , acute CV got emergency presentations so plain radiograph was the only available investigation which showed dilatation of small intestine with a markedly dilated caecum displaced to any part of the abdomen but frequently in the left upper quadrant (opposite the site of obstruction). This study showed radiological findings diagnostic in 5 cases (in 45.45%) but one study has opposed it (Yang SH, et al 2000). The differentiation from small bowel obstruction is problematic so early radiological examination is a must. In 6 cases (54.54%) diagnosis were made at operation which is comparable to other studies (O'Mara , CS et al 1979).

Therefore prompt diagnosis requires heightened clinical suspicion and timely acquisition of radiological aid (Peterson CM, et al 2009).

Due to unusual presentation of acute CV no prospective management trials are available to guide management de-

cisions (Rosenblat JM et al 2010). Most cases were explored due to severity and short duration of features of acute abdomen.

Axial rotation of caecum was found in all cases of this study. Caecopexy or right hemicolectomy with ileocolic anastomosis were done depending upon the viability of involved intestine. Resection with primary anastomosis has been the preferred surgical technique for the past several decades in comparison to previous studies in which caecopexy was frequently applied for ACV patients (Tuech JJ, et al 2002). When gangrenous caecum is present, ileocolic resection is the treatment of choice. In the absence of gangrenous caecum/bowel ,one study (Rakinik J, et al 2011) recommends caecopexy because of low morbidity, low mortality and low recurrence rate. In my study , caecopexy were done in 36.36% cases where caecum was viable.

Surgeons who prefer resection usually present recurrence rates and local complications while non-resectional approach advocate low mortality, low morbidity , less physiological insult and low recurrence rates (Delabroussi E, et al 2007). However, improvement in intraoperative and post operative care, low mortality and morbidity linked with colectomies performed with acute CV has declined significantly and is preferred over caecopexy.

Postoperatively, 2 (18.18%) patients developed wound infection which were treated by broadspectrum antibiotics which is also comparable with O'Mara CS, et al,1979 study. Another 2 (18.18%) patients developed anastomotic leak which were managed by drainage, higher broadspectrum antibiotics, intravenous (IV) fluids , IV protein, IV lipids, blood transfusion and improving the general condition of the patient. One patient (09.09%) developed wound dehiscence due to gangrenous caecum and the presence of peritonitis which was later managed by secondary suturing. One patient (09.09%) died of gangrene and perforation of the caecum with septicaemia due to delayed presentation and existing comorbid factors which is far less than other studies. Literature documents no mortality in the elective situation. If viable bowel is found at the time of an emergency operation, mortality ranges from 7% to 15%. This increases to 33-44% in the face of gangrenous bowel (Ballantyne GH, et al 1985 ; Friedman JD, et al 1989 ; Halverson AL, et al 1999).

In this period of time , no recurrence was detected till date in this study. However a ten year trial found no recurrence in other studies (O'Mara CS, et al 1979) .

Conclusion

Acute Caecal Volvulus is a rare entity surgical emergency and cannot be diagnosed unless there is heightened clinical suspicion on the basis of symptoms and signs. Although abdominal radiographs is essential in early diagnosis, CT abdomen seems mandatory. Laparotomy remains the primary treatment modality for acute cecal volvulus. Many patients are not diagnosed until exploration, and nonoperative modalities have generally been unsuccessful. Right hemicolectomy and ileocolic anastomosis should be the choice of surgery in gangrenous ceacum and peritonitis. Caecopexy should be done only in viable caecum .

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