

# Intestinal Obstruction: Etiology, Correlation between Pre-Operative and Operative Diagnosis

*Kadhim Jawad Obaid*

*Faculty of Medicine/ UiTM/ Malaysia, Specialist General Surgeon/Selayang Hospital*

## SUMMARY

A prospective study done In al Zaafaranya General Hospital in Baghdad/Iraq In the period between April 2003 and February 2007. Ninety two patients admitted to the surgical wards diagnosed as Intestinal obstruction.

The aim is to find out the possible common conditions resulting in causing this common surgical emergency. Also to compare the provisional clinical diagnosis about ischemic obstruction and the definitive post operative diagnosis. To encourage post graduate students to use their clinical abilities with the few laboratory and radiological facilities available needed to decide about the management of those patients.

## INTRODUCTION

Intestinal obstruction is a common and dangerous surgical emergency. If occidental trauma is excluded this is the commonest in the emergency service (1,2).

The aetiology and pattern of obstruction vary in different countries. In Western countries obstructed hernia used to be the commonest cause of intestinal obstruction in the first half of this century. Now intraperitoneal adhesions is the most frequent cause (1). But In the developing countries like ours. the obstructed hernias still occupy the top of the list of the causes of this surgical condition.

The problem facing the surgeons in this condition include first he should decide that the diagnosis is intestinal obstruction. Secondly the timing of surgical intervention putting in mind possibility of Intestinal Ischemia (strangulation) which needs urgent exploration (4).

Silen (5,25) re-emphasized the need for early surgical Intervention because of the difficulty In recognizing the strangulation clinically and higher morbidity and mortality in patient who had prolonged conservative therapy At the same time work continued to appear in using different types of clinical aids to find out the possibility of strangulation. The present prospective study was performed to further evaluate this problem.

## MATERIALS & METHODS

This series consist of 92 patients admitted to al Zaafaranya General Hospital in Baghdad In the period between April 2003 and February 2007 with Intestinal obstruction.

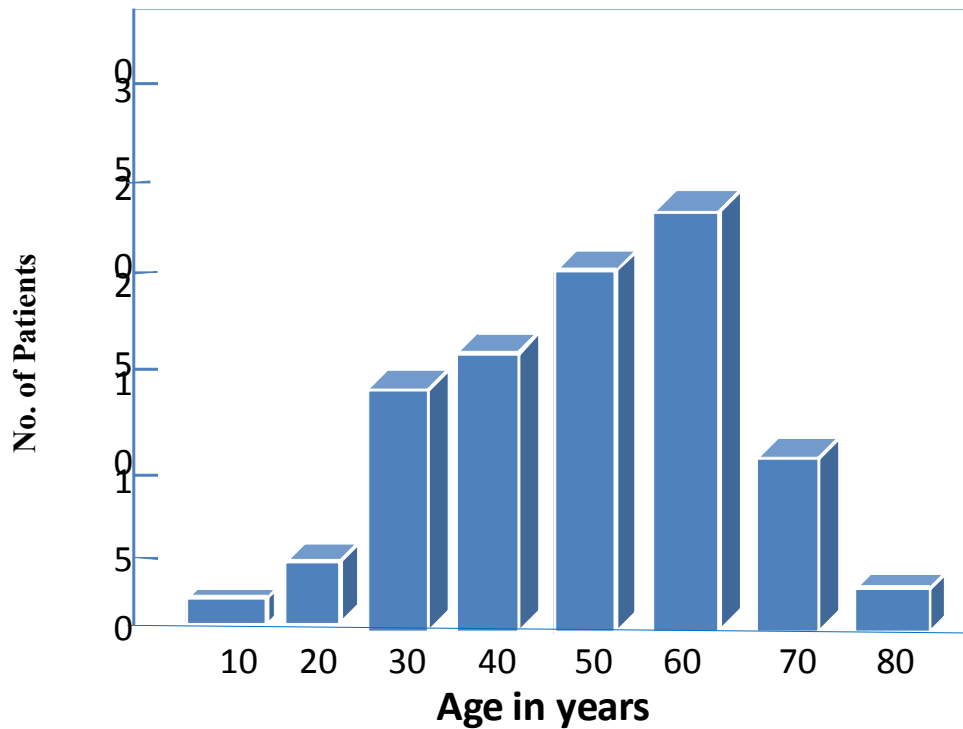
Our patients admitted first to the surgical casualty unit. Careful history and clinical examination with the necessary laboratory and radiological Investigation to confirm the clinical suspicion usually done in the some unit. During this period the necessary resuscitation given to the patient at the same time . Our provisional diagnosis depends mainly on the clinical history and full physical examination. Putting In mind certain physical findings which usually present in cases of strangulation among those are:

1. Abdominal tenderness, rebound tenderness and muscle guarding.
2. Tachycardia (above 100/min.).
3. Leucocytosis (above 10.000 per mm<sup>3</sup>).
4. Fever (above 38C).
5. Pain suggestive of strangulation.
6. Palpable abdominal mass or irreducible hernia.
7. Shock (hypotension).
8. Bloody diarrhea.

A good vein usually selected. Most of the patients receive at least a liter of Hartman's, solution or normal saline, with nasogastric tube suction. Laboratory Investigation done and Include Hb % and PCV, Blood Group and Rh . serum potassium . Blood urea. Random blood sugar, this is done in most of the cases as pre-operative Investigations. White cells count in suspicion of strangulation with Antibiotic usually given.

## RESULTS

Ninety two patients with Intestinal obstruction admitted to al Zaafaranya general hospital met the criteria of inclusion in this study.

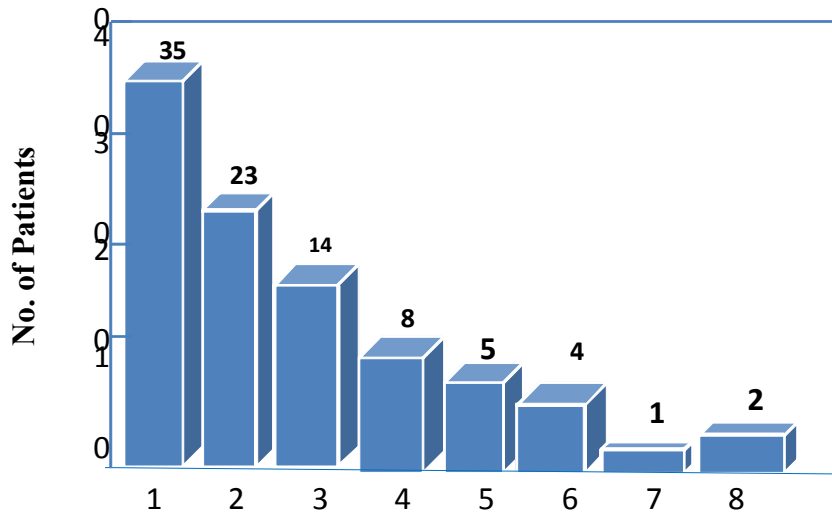


The age range was from 10- 80 years and above. Children below five years are excluded. The highest rates found among patients were in the fourth, fifth and sixth decades (Figure 1). In fact 78% of the patient was above 40 years. The maximum number of patients in the sixth decade (23 patients) (25%) (Figure 1) the sex ratio male: female about 2:1 this ratio relatively constant for the entire age groups. Figure 2 and Table 1 shows the etiology of all types of obstruction and give absolute incidence and the percentage of each causes.

External hernias were the most frequent cause of obstruction (35 patients) (38%). Inguinal hernia constitute the largest number of cases (24 patients) (26%) followed by Umbilical hernia (5

patients) (5.4%) and then femoral hernia (4 patients) (4.3%). Incisional hernia constitute (2 patients) (2.1%). Incisional hernia cause obstruction due to adhesions between the sac and the contents themselves as well as between the contents. There is no internal herniation reported in this series as a cause of Intestinal obstruction. Nearly most cases of external hernia causes small bowel obstruction (Table 2).

Bands and adhesions constitute the second common cause of Intestinal obstruction (23 patients) (25%). Most of bands and adhesions due to previous surgery specially appendectomy and gynecological operations.



1. External hernia
2. Bands & adhesions
3. Neoplasm
4. Valvulus
5. Intussusceptions
6. Mesenteric vascular occlusion
7. Foreign body
8. Others

**Figure 2** Etiology of Intestinal obstruction

**Table 1** Showing various Etiologies causing Intestinal Obstruction

Causes	No. of patient	%
External hernia	35	38
Band & adhesion	32	25
Neoplasm	14	15.2
Valvulous	8	8.6
Intussusceptions	5	5.4
Mesenteric vascular occlusion	4	4.3
Foreign body	1	1
Others	2	2.1
<b>total</b>	<b>92</b>	<b>100</b>
<b>Small bowel obstruction</b>	<b>68</b>	<b>73.9</b>
<b>Large bowel obstruction</b>	<b>24</b>	<b>26.1</b>

**Table 2** Shows types of hernias and their percentage**Table 2 Shows types of hernias and their percentage**

Type of hernia	No. of cases	%
Inguinal	24	26
Umbilical	5	5.4
Femoral	4	4.3
Incisional	2	2.1

Bands and adhesions is a major cause of small bowel obstruction. Neoplasms constitute the third common cause of intestinal obstruction (14 patients) (15.2%) it is a major cause of large bowel obstruction especially in elderly. Volvulus of the sigmoid colon constitutes (8 patients) (8.6%). Intussusceptions (5 patients) (5.4%) • two patients due to lymphoma later on proved by biopsy and histopathology. Mesenteric vascular occlusion (4 patients) (4.3%) most of them are old age with ischemic heart disease. Only one case due to vacuities and she is on steroid therapy.

One patient due to foreign body in the pelvic colon. It was removed by caecostomy and it was found to be a bony material. Another patient was due to round worm obstruction (*Ascaris lumbricoides*). Patient presented with small bowel obstruction and pre-operatively diagnosed as round worm obstruction by vomiting of worms. The patient treated conservatively and discharged well on Antihelminthic Drugs.

Another patient with tuberculous peritonitis presented with vomiting and constipation, he gave a history of fever for the last four months with ascitis. Chest X-ray shows pleural effusion on the left side. Peritoneal tap was done and found foul smell. During surgery scattered yellowish gray in colour nodules with multiple adhesions.

Adhenolysis done and biopsy taken. Patient postoperatively put on anti-tuberculous drugs.

#### **Mortality:**

There were four deaths in 92 patients (mortality rate 4.3%) the cause of death in one patient was

due to pulmonary embolism and one died due to myocardial infarction and other was due to septic shock and the last death was due to terminal malignancy. After careful assessment of the patients clinical features plain abdominal film supine and erect positions usually done for most of the patients to elucidate the level of obstruction and possible etiology and the possibility of perforation.

Laboratory investigation Include Hb% and PCV, Blood Group and Rh, serum potassium Blood urea, Random blood sugar . This is done In most of the cases as pre - operative investigations. White cells count usually done for patient with the possibility of internal strangulation. Most of the patients receive at least a liter of Hartman's solution or normal saline in the emergency unit. Nasogastric suction. Antibiotics usually given on suspicion of strangulation.

There were (68 patients) (73.9%) small bowel obstruction and 24 patients 26.1% large bowel obstruction (Table 1). About (35 patients) (38%) Table 3 diagnosed as simple intestinal obstruction pre-operatively were put on conservative therapy of those 13 patients the obstruction was relieved, and 22 patients obstruction not relieved and surgery done for them 5 patients was found to be strangulated bowel (Two patients due to external hernias. three patients due to bands and adhesions) and 17 patients with simple obstruction no strangulation.

There were 57 patients (61.9%) table 4 diagnosed as strangulated Intestinal obstruction pre-operatively according to criteria used In diagnosis of strangulation as shown in table 5 .

Table 3

Pre-operative provisional diagnosis as simple intestinal obstruction	Postoperative diagnosis
35 patient 13 patients relieved by conservative management	22 patient 5 patients ischemic intestinal obstruction 17 simple intestinal obstruction

Table 4

Pre-operative diagnosis as ischemic intestinal obstruction	Post-operative diagnosis
57 patients	36 strangulated intestinal obstruction 21 patients simple intestinal obstruction

Table 5 The frequency of signs and symptoms among 57 Patients.

Sign and symptoms	No. of patients	%
• Abdominal tenderness, rebound tenderness & muscle guarding.	28	49
• Tachycardia (above 100/min)	40	70
• Leucocytosis (above 10,000 per mm <sup>3</sup> )	36	63
• Fever (above 38C)	33	57.8
• Pain suggestive of strangulation	28	49
• Palpable abdominal mass or Irreducible hernia	38	66.6
• Shock (hypotension)	10	17
• Bloody diarrhea	8	3.5

All patients had at least two of the above finding.

Generally the most critically ill patient had the greatest number of symptoms. Abdominal tenderness, rebound tenderness and muscle guarding (49%). Tachycardia above 100/min was (70%), Leucocytosis above 10,000/mm<sup>3</sup> was noted in (63%), Fever above 38C in (57.8%) of the patients. Pain suggestive of strangulation in contrast to pain of simple mechanical obstruction tends to be more severe and constant in (49% of patients). (66.6%) of the patients has palpable abdominal mass or irreducible hernia. Hypotension seen in about 17% of patients and pre-operative, shock seen in two patients and it was an ominous sign. Bloody diarrhea or blood and mucous by

rectal examination commonly found in patients with Intussusceptions and mesenteric vascular occlusion. It constitutes 3.5%.

All patients have at least two of the signs of strangulation and the majority of patient had four or more.

Plain abdominal X-ray was not helpful in differentiating simple from strangulated abstraction. Peritoneal tap was done in some patients because of suspicion of free fluid in the peritoneal cavity on physical examination. In two patients It was found reddish brown In colour, on exploration patient was found to have mesenteric vascular occlusion while the other found to have

gangrene of small intestine due to band. Fetid odour of the aspirate found in one patient proves to be tuberculous peritonitis presented with Intestinal obstruction.

A positive tap is of great help in diagnosis but negative one is of little value, for it does not rule out strangulation intestinal obstruction (4). So we found In 57 patients table 4 who were diagnosed pre-operatively as strangulated intestinal obstruction only 36 patients (6%) were get

strangulated Intestinal obstruction and actually 9 of them table 5 get gangrenous bowel in which resection of the gangrenous bowel done, and in 21 patient no strangulation was found.

In 35 patients table 3 who were diagnosed pre-operatively as simple Intestinal obstruction. Later on 5 patients (14%) were found to have strangulated intestinal obstruction after exploration.

**Table 6** Showing the etiological basis of gangrene

Types	No. of cases	%
Hernia	2/35	5.7
Band	2/25	8.9
Mesenteric vascular occlusion	3/4	75
Intussusceptions	1/5	20
Valvulous	1/8	12.5

Surgical techniques and operative procedure:

Total number of patient operated on were 79 and of them viable gut was found In 89% of patients. Gangrenous bowel found in 11% of the operated cases. The procedures done in our series are:

1. Exploratory laprotomy to discover the nature and site of obstruction.
2. Lysis of bonds and adhesions.
3. Release of strangulated external hernia followed by simple repair of the canal.
4. Colostomy or caecostomy as emergency life saving procedure.
5. Resection of the gut and primary anastomosis or colostomy (Hartmann).
6. Short circuiting around the obstructing agent.

## DISCUSSION

Intestinal obstruction is a common surgical emergency. The aetiology and type of intestinal obstruction varies according to the geographical distribution (1). In our series 92 patients who have been admitted to Baghdad teaching hospital, we found that 38% of this series were due to obstructed external hernias.

So in this series obstructed external hernia constitute the most common cause which goes with other series done In developing countries (9). Ellis (2) found that in less developed communities strangulated hernias (particularly inguinal hernia) remain the most common cause of intestinal

obstruction. In the first decades of this century strangulated hernia account for a high percentage of cases. The incidence has dropped considerably in the western world. Probably due to early elective repair. By contrast, adhesions have become more and more common cause owing to the enormous increase in the frequency with which abdominal surgery is now being performed (2,13, 14).

In England and America the commonest cause of intestinal obstruction today is bands and adhesions (1). Ellis (2) in a definitive article has stated that adhesions are the most common cause of obstruction in western world now days. Playforth et al. (15) found in their series of 111 patients that adhesions, account for more than 50% of the cases of intestinal obstruction and obstructed hernias for 23%. Asbun et al. (17) found in his article, analysis of 105 patients with small bowel obstruction adhesions account for 73% of cases. Blzel et al. (16) reviewed 405 patients and found that almost 75% of the cases of obstruction were due to adhesions and only 8% to hernias.

The explanation for this change is that nowadays more abdominal operations being performed and therefore the incidence of postoperative adhesions are increasing. At the same time more and more patient having their hernias repaired electively and are therefore in little danger of subsequent obstruction (9).

Joslonioh et al (18) in his research in Saudi Arabia population they found adhesions from previous laprotomy constituted the commonest cause of intestinal obstruction 57%. This pattern of intestinal obstruction is similar to those in western

world or developed countries . This explained on the fact that even though Saudi Arabia is a developing country the health care delivery system is similar of those in developed countries.

In our country strangulated hernia still the most common cause due to the following:

1 - Lack of health education. Our population unaware of the possible complications might happen due to leaving asymptomatic hernia without treatment.

2- Effect of embargo causing severe shortage of medical supplies also resulting in delay or postpone most of elective operations, including hernia.

3 - We have noticed that many patients from our population try to postpone asymptomatic hernias or conditions which not interfere with their work and earnings due to economical difficulties.

**Table 7** Showing the commonest cause of mechanical Intestinal obstruction and it's percentage in different countries

country	Common causes of obstruction	%
England(2)	Adhesion	73
USA (2)	Adhesion	75
India (1)	Hernia	50
Saudi Arabia (18)	Adhesion	57
Nigeria (11)	Hernia	65
Uganda (12)	Hernia	75
China (10)	hernia	78

The second common cause of Intestinal obstruction in our series is bands and adhesions (25%).

Neoplasm's account for 14 patients (15.2%) mostly colonic tumours, and account for commonest cause of large bowel obstruction. Volvulus of the sigmoid is about 8.9% and it is the second cause of large bowel obstruction and in (12.5%) of them gangrene of the bowel found.

Intussusceptions account for (8patients), (20%) of them was gangrenous . Mesenteric vascular occlusion (4 patients), (75 %) of the were gangrenous. Foreign body 1 patient It was bony material and It is removed by caecostomy . One patient of tuberculous peritonitis presented with intestinal obstruction. Lysis 01 the adhesions done and patient put on anti-tuberculous therapy.

Other case found worm infestation presented with intestinal obstruction diagnosed by vomiting of worms (Ascaris). Villamizor et al (19) shows that half of the patients has a history of passing worm by mouth or anus.

Chungoo RK et al (20) shows amongst of 876 cases of Ascariasis 27.7% presented with sub acute Intestinal obstruction and 11.4% with acute intestinal obstruction.

In 57 patients (table 4) Who were diagnosed pre-operatively as strangulated intestinal obstruction according to the following clinical findings which have been found:

Abdominal tenderness rebound tenderness and abdominal gaurding in 49%, tachycardia above 100/min.In 70% leucocytosis above 10.000 per mm<sup>3</sup> in 63%, fever above 38°C in 57%, pain suggestive of strangulation in 49%, palpable abdominal mass or irreducible hernia 66.6% shock\ or hypotension 17% , bloody diarrhea 3.5%.

After surgery only 36 patients table 63% were having strangulated Intestinal obstruction and actually 9 of them a gangrenous bowel were found. In 21 patients no strangulation were found. So in 63% of patients with strangulation were correctly diagnosed before surgery. In 35 patients (table 3) who were diagnosed pre-operatively as simple intestinal obstruction. 13 of them relieved by conservative therapy and 22 patients fail to be relieved. On exploration 5 patients 14% get strangulated bowel. So 14% of the patients wrongly diagnosed as simple intestinal obstruction. Cross KSH (9) was found 14 patient need bowel resection. But in only 3 of those were the preoperative clinical suspicions were correct. Silan et al (21) found that in only 15% of patients with strangulation were correctly diagnosed before surgery.

Others (22.23) have shown that differentiation between simple obstruction and that due to strangulation was difficult and have recommended early operation on mechanical

Intestinal obstruction to ovoid catastrophe of strangulation.

In the recent series by Stewardson, Bombeck and Nyhus (24). The correlation of combination of the so called classical findings with the presence of gangrenous bowel they found in nearly 90% of the patient they exhibit two or more of the following findings as fever, Leucocytosis, tachycardia and localized abdominal tenderness should be present.

No patient had gangrenous bowel without at least one of these classic findings. In general, the more of these findings that are positive the greater the incidence of strangulation.

In our series patients diagnosed as simple intestinal obstruction their management started conservatively with close clinical observation including enquires about passing of flatus or motion, repeated abdominal examination and chart for vital signs, which usually continued for 12--24 hours.

Looking for any changes in the clinical status of the patient and vital signs including increasing abdominal pain, rising temperature, increase pulse rate, increase WBC count.

These warning signs considered as an indication for operative exploration. Leffatl MD (4) said that early operation for patient with strangulation obstruction is necessary to reduce mortality. With prompt surgical intervention the strangulating element may be removed before gangrene of the bowel ensues.

Careful search for signs and symptoms of strangulated intestinal obstruction should allow earlier diagnosis and therapy. Ellis H (2) said once clinical diagnosis of obstruction is made even when radiological appearance are normal and there is nothing to suggest strangulating the best treatment is still urgent surgery.

Cantor MO (25) said once there is clinical suspicion of obstruction the best treatment is immediate surgery. Delay will only increase morbidity and mortality.

## CONCLUSION

In our study we found complicated external hernias are the commonest cause of Intestinal obstruction. So that education of people for early repair of external hernias should be advised. Careful Clinical history with clinical examination remains the cornerstone by which we can differentiate between simple and ischemic obstruction. Early diagnosis of possible strangulation will markedly decrease morbidity and mortality.

## ACKNOWLEDGEMENT

I am greatly indebted to Dr. Fali Muhammad Husson Al-Ubodi my teacher for his faithful help and Guidance, kind and skilled advice, support, for which I Am and always be very grateful.

## REFERENCES

1. Chakarabarty P.B, Tripathy B.C., Pandak. Acute intestinal obstruction. J. Indian M.A. 1976; Vol. 67. No.3: 64-68.
2. Ellis H. Mechanical intestinal obstruction. Br. Med. J. 1981; 283 : 1903-4.
3. Clayton W, Frederick W, Intestinal obstruction. Gold Smith practical of surgery; Byrne General Surgery 2. 1982.
4. Leffall LD, Syphx B. Clinical aids in strangulation intestinal obstruction. Am. J. Surg. 1970; 1:20: 756-9.
5. Silm W. Strangulation obstruction of the small bowel. Arch. Surg. 1962; 85: 137.
6. Johnston JG. Small bowel obstruction: a review of 456 cases in a west of Ireland region. J. Royal Soc. M. 1987; 80: 149-50.
7. Silen W, Hein MF, Coldman L. Strangulation obstruction of small intestine. Arch. Surg. 1962; 85 : 121-8.
8. Bailey and Loves. Short practice of surgery: Intestinal obstruction. 1991;21 : 1172.
9. Cross KSH, Johnston, JG. Small bowel obstruction; a review.
10. Badae EA. Pattern of acute intestinal obstruction in Acca. west African Medical Journal 1968 ; 17 : 194-5.
11. Chiedozi LC, Aboh IO, Piserchia WE. Mechanical bowel obstruction : review of 316 cases In Benincity. Am. J. Surg. 1980: 139 : 38A-93.
12. McAdam IWJ. A three year review of intestinal obstruction in Mulago hospital. Kampala. Uganda 1958-1960 East Afr. Med. J. 1961 : 38 : 536-43.
13. Banerjee B.M. Indian. J. Surg. 1950; 12: 195.
14. Shansali S.K., Sethna J.R., Ibid. 1970: 32:57.
15. Playforth RH, Holloway TB, Frillin WO. Mechanical small bowel obstruction : A plea for earlier surgical intervention. Ann.Surg. 1970 ; 179 : 783-6.
16. Bizer L.S., Liebling RW, Delomv HM, Gliedman ML. Small bowel obstruction : The role of nonoperative treatment in simple intestinal obstruction and predictive criteria for strangulation obstruction. Surgery 1980; 84 : 407-13.
17. Asbun HJ, Pempinell C, Halasz NA. Small bowel obstruction and its management. Int. surg. 1989;74 : 23-7
18. Jastaniah S, Abu Eshy S, Baton KAN, Al-Shahri M. intestinal obstruction in Saudi Arabian population. 1996;73: 764-6.
19. Villamizar E, Mendez M, Bonilla E, Varon H, de-Onatra S. Ascaris lumbricoides infestation as a cause of



- intestinal obstruction in children  
experience with 87 cases .1996; 31 : 201-  
4.
20. Chrungoo RK, Hanglo VK, Faroqui, Khan M. Surgical manifestation and management of Ascariasis in Koshmlr.1992; 90 : 171-2.
  21. Silen W, Hein MF, Goldman L. Strangulation obstruction of the small intestine . Arch. Surg. 1962; 85: 121·8 .
  22. Snyder EN, McCrale D. Closed loop obstruction of The small bowel . Am. J . Surg. 1966 ; 111 : 398-400.
  23. Shantiea AH, Chamberlain BE, Webb WR. Current status of diagnosis and management of strangulation obstruction Of the small bowel. Am. J. Surg. 1976; 12 : 299·303.
  24. Stewardson RH, Bombeck CT, Nyhus IM : Critical operative management of small bowel obstruction . Ann. Surg. 1978 ' 187 : 189.
  25. Snyder EN, McCranie D: Closed loop obstruction of the small bowel . Am. J . Surg. 1966 ; 111 : 398.