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Research Article

Results of emergency management of acute abdomen in adults based on clinical assessment and basic imaging investigations: are advanced imaging techniques always necessary for successful treatment?

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ABSTRACT

Background: The term acute abdomen refers to signs and symptoms of abdominal pain and tenderness, a clinical presentation that may require emergency surgical treatment. Patients suffering from both, surgical as well as medical diseases may present with acute abdomen. The main objectives of the study are to identify common causes of acute abdomen, to assess the need for urgent surgical intervention in these patients and to evaluate role of basic diagnostic techniques and need of advanced imaging studies.
Methods: Forty patients with acute onset abdominal pain were included in the study. Patients with pain related to pregnancy, trauma and pediatric age group were excluded from the study. All patients were subjected to detailed history and clinical examination, X-ray abdomen in erect position and ultrasound examination of the abdomen and pelvis. CECT of abdomen and pelvis was performed only when there were diagnostic difficulties and for deciding about need for surgical intervention.
Results: Out of 40, fifteen (37.5%) patients required surgery within 24 hours and 14 (35%) patients underwent elective surgery after emergency treatment. Eleven (27.5%) patients were managed conservatively.
Conclusion: Study shows that the commonest causes for acute abdomen are acute appendicitis and cholelithiasis with /without cholecystitis. Almost 1/3rd of the patients required emergency surgery. And CECT of abdomen and pelvis was helpful in decision making between conservative and surgical management of acute abdomen in selected cases.

Keywords: Acute abdomen, Emergency laparotomy, Negative findings at laparotomy, Diagnostic difficulty, Criteria for exploratory laparotomy

INTRODUCTION

The term acute abdomen refers to signs and symptoms of abdominal pain and tenderness, a clinical presentation that may require emergency surgical treatment. Patients suffering from both, surgical as well as medical diseases may present with acute abdomen. The patients need to be evaluated with detailed history and careful physical examination, appropriate laboratory tests and imaging studies. Presence of pain in abdomen and its location is the most informative symptom in patients with acute abdomen. The pattern of radiation of pain may provide important clues as to its origin.[1] Women of reproductive age and elderly individuals represent some of the most challenging case scenarios to evaluate. Although there are general diagnostic and clinical principles that apply to the evaluation of all patients, these two groups deserve extra attention because of the broad differential diagnosis and potential for serious complications[2]. Plain x-ray abdomen is an useful tool for confirmation of various surgical causes of acute abdomen.[3] Only a minority of patients admitted with acute abdominal pain require urgent

operation, but the identification of those who need an operation may be difficult. The diagnostic dilemma may lead to negative findings at laparotomy. In such a scenario, active observation of patients helps in minimising the chances of negative findings on laparotomy.[4]

The main objectives of the study are to identify common causes of Acute Abdomen, to assess need of urgent surgical intervention in patients presenting with Acute Abdomen and to asses role of basic imaging tests and need for advanced imaging techniques.

METHODS

Study was conducted over a period of 15 months, from January 2015 to March 2016, 53 patients presented to Arihant Hospital with Acute Abdomen. Out of 53 patients, 13 patients were excluded from the study due to following reasons:

- Pregnancy related abdominal pain = 4 cases
- Blunt abdominal trauma / road traffic accident / assault = 6 cases
- Pediatric age group = 3 cases

Thus, data of 40 patients was selected for the study. Detailed history was obtained from all patients and thorough physical examination was performed. Basic investigations were performed in all patients and contrast enhanced CT scan (CECT) was performed in select cases when indicated. The following Basic investigations were performed in all 40 patients:

- X-ray Abdomen Erect AP view
- Ultrasound examination of abdomen and pelvis

All the 40 patients were admitted and treated appropriately according to reports of investigations and diagnosis.

RESULTS

Table 1: Age and sex distribution.

Age Group	Male (%)	Female (%)	Total (%)
10 to 20 years	2	0	2
20 to 30 years	4	3	7
30 to 40 years	7	2	9
40 to 50 years	5	5	10
50 to 60 years	5	3	8
60 years and above	3	1	4
Total	26 (65)	14 (35)	40

As shown in the table, men were more likely to present with acute abdominal pain as compared to women. All patients presented with acute onset abdominal pain with or without any 1 or more of the following symptoms.

Table 2: Presenting complaints.

Symptom	Present in (%)
Pain	40 (100)
Vomiting	24 (60)
Fever	10 (25)
Abdominal Distention	20 (50)
Non passage of stools and flatus	12 (30)

Table 3: Presence of signs.

Signs	Present in (%)
Tachycardia	35 (87.5)
Hypotension	2 (5)
Tenderness	30 (75)
Guarding/rigidity	20 (50)
Absent bowel sounds	18 (45)
Other	1 (2.5)

Only 1 patient had redness and raised temperature in the skin of right iliac fossa and his diagnosis was large infected sebaceous cyst leading to cellulitis and abscess formation.

Table 4: Final Diagnosis of all the patients.

Diagnosis	Male (%)	Female (%)	Total (%)
Intestinal obstruction	3	2	5 (12.5)
Intestinal perforation	2	1	3 (7.5)
Pancreatitis	4	0	4 (10)
Appendicitis	9	4	13 (32.5)
Cholecystitis/ cholelithiasis	3	5	8 (20)
Urolithiasis	5	1	6 (15)
Others	0	1	1 (2.5)
Total	26 (65)	14 (35)	40

The commonest cause of acute abdomen was observed to be acute appendicitis among males and acute cholecystitis among females. Overall, the commonest cause was acute appendicitis. Out of 5 patients of intestinal obstruction, 1 patient had partially irreducible incisional hernia, 1 patient had obstructed inguinal hernia and 1 had adhesive intestinal obstruction. The other 2 cases were found to have neoplastic growth at ileocaecal junction.

Two cases of intestinal perforation were due to duodenal ulcer perforation and 1 was due to perforation in terminal ileum. Out of 4 cases of Pancreatitis, 2 were due to alcohol, 1 gall stone related and 1 was primary autoimmune pancreatitis. Among 6 patients who presented with ureteric calculi, 4 patients had lowered ureteric and 2 cases had upper ureteric calculi. Only 1 patient came with large infected sebaceous cyst with cellulitis and abscess on right lower abdominal wall.

Apart from 8 patients having intestinal obstruction and / or perforation, x-ray abdomen was helpful in only 4 of 8 patients with urolithiasis. Ultrasonography of the abdomen revealed conclusive diagnosis in majority of cases of cholecystitis, urolithiasis, appendicitis and pancreatitis. Contrast enhanced CT scan of abdomen was necessary in all cases of pancreatitis and intestinal obstruction (9 patients). CT scan helped in the determination of etiology of the intestinal obstruction and diagnosis of neoplastic etiology.

Table 5: Accuracy of basic investigation with regard to final diagnosis.

Diagnosis	Findings on X-ray	Findings on ultrasound	Total
Intestinal Obstruction	Air-Fluid Levels seen in all 5 patients	Non-specific gas / fluid filled bowel loops	5
Intestinal Perforation	Free intra-peritoneal gas seen in all 3 patients	Non-specific gas filled bowel loops with free fluid in peritoneal cavity	3
Pancreatitis	Dilated gas filled jejunal loops seen in 2 / 4 cases	Features of Acute Edematous Pancreatitis seen in 2 / 4 patients, in other 2 cases, only Non-specific gas filled bowel loops	4
Appendicitis	Normal in 10 / 13 Non-specific gas filled bowel loops in 3 / 13	Confirmed diagnosis in 6 / 13	13
Cholecystitis/ cholelithiasis	Normal 8 / 8	Confirmed diagnosis in 8 / 8	8
Urolithiasis	Calculus seen in 4 / 6	Confirmed diagnosis 5 / 6	6
Others	Normal	Normal	1

Table 6: Outcome of emergency treatment.

Diagnosis	Emergency surgery (ES)	Planned surgery (PS)	Conservative management (CM)	Total
Intestinal obstruction	3	1	1	5
Intestinal perforation	3	N / A	N / A	3
Pancreatitis	N / A	N / A	4	4
Appendicitis	8	3	2	13
Cholecystitis/ cholelithiasis	N / A	6	2	8
Urolithiasis	N / A	4	2	6
Others	1	N / A	N / A	1
Others	15 (37.5 %)	14 (35 %)	11 (27.5 %)	40

ES: Emergency Surgery, performed within 24 hours of admission after stabilisation of the patient and basic investigations , PS: Planned Surgery, patient stabilised with basic treatment, diagnosis established with investigations, advised elective surgery to be performed after controlling inflammation, CM : Conservative Management, patient did not require surgery or did not follow up for elective surgery after initial diagnosis and treatment.

As seen from the table 6, 15 patients presenting with acute abdomen required emergency surgery, 14 underwent planned surgery and 11 were managed conservatively.

DISCUSSION

Over 15 month's period, 53 patients presented with acute abdomen and 40 of them were included in the study. The data thus collected was analysed and compared with already published data. The variations and similarities are discussed below. The mean age of patients in this study was 45 and maximum patients (10) were aged between ages of 40 to 50 years. In studies published by Randen A et al and Allemen F et al, the mean age reported was 47

and 45 years respectively.[5,6] There were 26 (65%) males and 14 (35%) females in the study. The male preponderance correlates with the studies done by Nega B et al.[7] The most common diagnosis was acute appendicitis (32.5%) followed by cholelithiasis (20%) and urolithiasis (15%) in that descending order. Among females, most common diagnosis was cholelithiasis and appendicitis was found to be 2nd commonest. Similar results have been reported in a study by Hwang H et al which correlates well with observations of the present study.[8] It was also observed that 1 out of 3 patients with

acute abdomen was suffering from more serious conditions such as pancreatitis, intestinal obstruction with / without intestinal perforation.

Basic radiological investigations (x-ray abdomen erect view and ultrasound examination of abdomen and pelvis) were performed in all the patients. Erect x-ray of abdomen was 100 % diagnostic in all patients with intestinal obstruction and perforation. The plain x-ray abdomen was found to be indispensable in imaging of abdominal gas shadows and similar results have been quoted in the literature.[9-11] The plain x-ray abdomen could also detect urolithiasis in 4 out of 6 patients. Thus, x-ray abdomen was useful in diagnosis of surgical causes of acute abdomen[3]. In all other diseases, erect X-ray abdomen was found to be least contributory towards the diagnosis.[12]

Ultrasound examination of abdomen and pelvis was performed in all patients with acute abdominal pain. The abdominal ultrasound could diagnose 50% cases of acute appendicitis and acute pancreatitis. Puylaert JB et al, reported an accuracy of 89% in diagnosis of acute appendicitis using graded compression examination. In the present study, ultrasound could detect 100 % cases of cholelithiasis and cholecystitis.

Hwang H and Shea JA et al, in their respective studies reported similar results and proved USG to be more helpful than conventional oral cholecystogram.[8,13,14] In current study, almost 83 % cases of urolithiasis were diagnosed accurately by ultrasound examination of the abdomen as compared to 62 % diagnostic accuracy reported by Haroun AA et al.[15]

In this study, CECT helped in diagnosis and treatment of 9 patients. Four patients out of 5 suffering from intestinal obstruction were treated surgically and all 5 patients diagnosed as pancreatitis were managed conservatively bases on CECT scan reports.

In the present study, it was observed that 15 (37.5%) patients required emergency surgery within 24 hours from the time of admission. Fourteen patients (35%) were advised elective surgery after diagnosis and emergency treatment.

The patients who were managed conservatively (11 patients 27.5%) were mostly diagnosed as pancreatitis or urolithiasis. Only 1 case of sub-acute intestinal obstruction was managed conservatively. Minimal evidence exists to validate the benefit of damage control surgery in general surgical abdominal emergencies. Therefore, immediate surgical intervention has to be planned in well selected patients and should be used prudently[16].

CONCLUSION

Acute abdominal pain causes significant disturbance in patient's physiology and lifestyle. It's one of the major symptoms which compel a patient to visit hospital even at odd hours to seek relief and appropriate treatment. The main conclusions can be drawn from this study are as follows:

1. The commonest surgical cause of acute abdominal pain in this study was found to be acute appendicitis followed by gall stone disease.
2. Almost 2/3rd of the patients with acute abdominal pain required surgical intervention (37.5 % within 24 hours, and 35 % elective surgery at a later date as a definitive treatment).
3. CECT as a diagnostic tool is required in almost 1/4th of the cases and the findings significantly dictate the choice between conservative versus surgical modality of treatment.

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