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A Tale of Two Colonic Injuries: Early vs Late Colonic Injuries Presentation and Their Management.

Srinath G*, Sasikumar P, Ravishankar KS, and Suresh Babu P,

Sree Balaji Medical College and Hospital, Bharath University, Chrompet, Chennai – 600044, Tamil Nadu, India.

ABSTRACT

Colonic injuries are more common in penetrating abdominal injuries than blunt injuries. Here we present two cases of blunt injuries with isolated colonic injuries. Time of detection of injuries decreases mortality and morbidity of the patient. One case which was detected very early had a smooth recovery following surgery and another case was detected late and had stormy post-operative period and increased morbidity.

Keywords: colonic injury, abdomen, blunt injury, surgery.

Corresponding author

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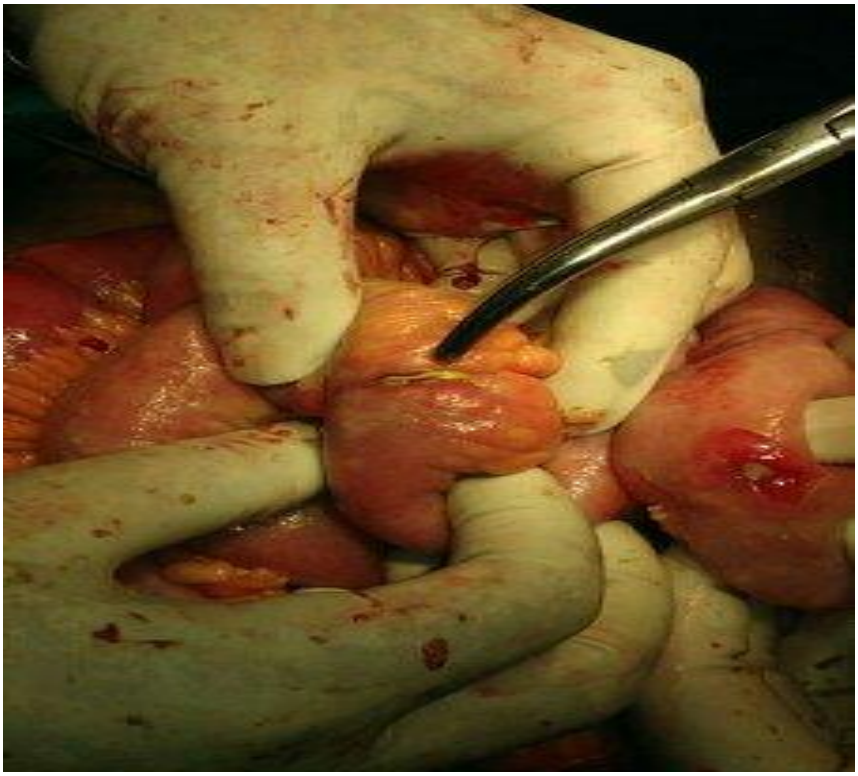
INTRODUCTION

The low incidence of colon injury due to blunt abdominal trauma and the lack of a definitive diagnostic method for the same can lead to delays in diagnosis and treatment, subsequently resulting in high morbidity and mortality [1,2].

Case Report 1

22yr Old Male presented to emergency department with history of blunt injury abdomen [3] following road traffic accident. Diffuse abdominal pain for one hour ON EXAMINATION: patient isaferbile, dehydrated, not pale. Vitals: PR 112/min, BP 100/70mmHg. Other system normal, Local examination- severe tenderness all over the abdomen, guarding and rigidity+, Bowel sound– Absent. P/R: Anal sphincter tone normal, rectum empty. Routine blood investigations: presences of leucocytosis. X ray Abdomen erect : Air under diaphragm present. Usg whole abdomen: Free fluid noted in the morrisons pouch & pelvis. Solid organs are normal. PLAN: EMERGENCY LAPAROTOMY AND PROCEED. FINDINGS: Pin point perforation of size 0.5 X 0.5 mm noted in the splenic flexure during thorough laparotomy. Peritoneal contamination with mucus flakes and toxic fluid. Solid organs and hollow viscus organ are normal. Procedure: perforation edges were freshened and primary closure done. Thorough wash given. DT kept and abdomen closed in layer .No complications encountered in the post-operative period



Case Report 2

53 yr old male presented to emergency department with blunt abdominal trauma following impact against a metal rod in bus one week back. Dull aching abdominal pain for 2days.Parietal wall swelling over left lumbar and iliac fossa for 2days.Patient had not passed stools for 2 days. On examination patient is afebrile, dehydrated, pallor+. Vitals: BP: 110/70mmHg,PR: 78/min. Other systems: CVS-S1S2 heard, RS -NVBS, no added sounds. Local examination Abdomen vague mass in the anterior abdominal wall about 8 x 6cm extending from umbilicus to left lumbar and iliac region. no warmth, localised tenderness+, guarding present, no rigidty. Bs heard. P/R Anal sphincter tone normal, loaded rectum+. Routine blood invegtigation shows anemia, leucocytosis. Usg whole abdomen: revealed well defined predominantly hypoechoic lesion seen in the

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abdominal wall in left lumbar and iliac region - ?Haemtoma. solid organs are normalno free fluid noted in peritoneal cavity. Patient treated conservatively with antibiotics and analgesics. Upon observation---after 24 hours of admission, patient persistantly complained of diffuse abdominal pain. Patient appeared toxic, decreased urine output, VitalsBP:100/70mmHg PR:120/min .CT whole abdomen revealed bowels loops adherent to anterior abdominal wall with haemtoma.

In view of patient condition deteriorating => Plan: EMERGENCY LAPAROTOMY AND PROCEED. FINDINGS: After the incision parietal layers were sloughed out and showed signs of pus in between parietal layers. Bowel loops adherent to parietal wall. Two perforations of size 1X1cm on an average noted in the splenic flexure and descending colon. Other solid organs and hollow viscus organ are normal PROCEDURE: limited resection -involving part of transverse colon, splenic flexure and descending colon done after preservation of the right branch of middle colic artery and the vascularity to sigmoid colon. End transverse colostomy fashioned and the distal limb comprising of sigmoid colon closed and left intra abdominally. Slough excision done and thorough wash given. DT kept and abdomen closed in layers. Patient had stormy post op period various complications like respiratory problems, sepsis and burst abdomen developed. Patient was on

ventilatory (noninvasive and invasive) and ionotropic support. Difficulty Weaning off ; Elective Tracheostomy done . Vaccumassissted abdomen closure. patient recovered after a period of two months.

DISCUSSION

Colon injuries generally occur after penetrating abdominal trauma. Rarely encountered after blunt abdominal trauma. Incidence of colon injuries due to blunt abdominal trauma has been reported to be 1.1%.Motor vehicle accidents are the most common reason of colon injuries due to blunt abdominal trauma. Other common causes include impacts to the abdomen (a direct blow, occupational accidents) and falls. Male to female ratio is 60:40, age 20 to 30yrs.

Several mechanisms have been described for colon injuries occurring after blunt abdominal trauma.

- Crushing of the colonic segment between two objects (between the seat belt and vertebra or pelvis posteriorly) is the most widely accepted mechanism. This results in local lacerations of the bowel wall, mural and mesenteric hematomas, transection of the bowel, localized devascularization and full-thickness contusions. Devitalization of the areas of contusion may subsequently result in late perforation.
- Rapid deceleration is the second mechanism. This creates shearing forces between the natural fixed points, which are the Treitz ligament, both ends of the sigmoid colon, and ileocecal junction, and the mobile portions of the colon.
- The third mechanism is a burst injury, which occurs by the closure of the colonic segments during trauma. The bowel ruptures or bursts when the intra-luminal pressure exceeds the tensile strength of the bowel wall.

The transverse colon is the most vulnerable colonic segment to blunt trauma due to its unprotected location. The sigmoid colon is relatively less vulnerable and is generally exposed to closed-loop perforationsIn a patient thought to have a colon injury caused by blunt abdominal trauma, the time between emergency department admission and surgery is of particular importance. A shorter duration minimizes the morbidity and mortality that would be encountered in the post-operative period. The rate of complications associated with colon injury is significantly higher if the duration is longer than 24 h after the injury.

At present, there is no single method to accurately diagnose colon injuries caused by blunt abdominal trauma. There are some studies suggesting the efficacy of repetitive physical examination and observation in diagnosing colon injury caused by blunt abdominal trauma in the first six hours, during which the signs of peritoneal irritation appear. Tenderness, guarding, distension and abdominal wall contusion are valuable findings on physical examination. However, the absence of these findings does not rule out intra-abdominal pathology. The presence of leucocytosis becomes significant when interpreted together with the findings from physical examinations and the results of other diagnostic methods. Plain radiographs are not reliable in detecting the presence of a significant injury; the results appear normal in most cases. Ultrasonography has been widely used to evaluate blunt abdominal trauma. Ultrasonographic findings of free fluid in the abdomen, particularly between the intestinal loops without the presence of solid organ injury, may indicate a bowel injury. Computed tomography[4] is the most appropriate diagnostic tool to document abdominal injury; however, its diagnostic value for patients with colon injury remains controversial. On computed tomography, presence of free air in the abdomen and extravasation of the contrast agent are significant findings.

GRADING OF COLONIC INJURIES Grade 1-contusion or haematoma, parital laceration. Grade 2- Small (<50% of circumference) laceration. Grade 3- Large (>50% of circumference) laceration. Grade 4-Transection, Grade 5-Transection with tissue loss, devascularised segment.

TREATMENT

Treatment options include primary closure (colorrhaphy), resection with anastomosis, and colostomy. Primary closure (colorrhaphy) is performed for injuries involving less than 50% of the colonic wall, whereas resection with anastomosis is performed when the tissue loss is more than 50% or when there is extensive mesenteric injury impairing the blood supply. Colostomy should be performed when there are more than two abdominal organ injuries, when the amount of intra-abdominal bleeding is above 1000mL, when there is gross

fecal contamination within the abdomen, and when the time between the injury and treatment exceeds eight hours.

Morbidity and mortality rates following blunt abdominal traumas are increased in colon injuries depending on the difficulties in diagnosis and treatment. The most common post-operative complications were wound site infection, intra-abdominal abscess, intra-abdominal sepsis, and post-operative bleeding.

CONCLUSION

In summary, colon injury due to blunt abdominal trauma is a rare clinical condition, and treatment delays due to difficulties in diagnosis increase the morbidity and mortality rates. Early diagnosis is the key to success, repeated examination is mandatory to make a firm diagnosis – particularly in the retroperitoneal organs.

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