

# ISOLATED MESENTERIC VASCULAR INJURY FOLLOWING A BLUNT ABDOMINAL TRAUMA – A CASE REPORT

S A Buhari

## ABSTRACT

*Isolated injuries of the small bowel mesentery following blunt abdominal trauma are rare. In this report, one case of such injury with subsequent bowel infarction is described. Bowel resection with end-to-end anastomosis was done and the patient had an uneventful recovery. Other similar case reports are reviewed and compared. The main significance of this injury is the delay and difficulty in diagnosis, especially when there is minimal signs and symptoms to warrant an exploratory laparotomy. Diagnostic peritoneal lavage is a useful tool in such injuries and has produced good results.*

**Keywords:** mesentery, vascular, trauma, seatbelt, abdominal injury.

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## CASE REPORT

A 21-year-old male was a front seat passenger in a car when it collided with a stationary object. He was wearing a seatbelt. He was seen at the casualty department 2 hours later, complaining of pain in the upper abdomen. His pulse was 88 per minute and BP 140/80. Abdomen was soft and without any tenderness or guarding. Plain abdominal X-ray revealed no fracture and the bowel shadows were normal. There was no blood in the urine. He was given analgesics and advised to come back should the pain worsen or general condition deteriorate.

He was seen again 9 hours later for the complaint of feeling weak and drowsy. He was pale and tachypneic. Pulse rate was 141 per minute and BP 55/40. Abdomen was tender on the right side with guarding. He was admitted and laparotomy was performed two hours later after resuscitation. At operation, a V-shaped tear was found at the root of the mesentery with a 90cm segment of infarcted terminal ileum. There was no perforation of the bowel or any other intra-abdominal visceral injury. The infarcted segment was resected and an end-to-end anastomosis was done. The histology showed infarcted ileum with viable tissue at the resected ends. The patient made an uneventful recovery and was subsequently discharged.

## DISCUSSION

Blunt abdominal trauma with mesenteric tear and gut perforation has long been recognised as part of the seatbelt syndrome. Most of the time, the two conditions co-exist and only rarely does an isolated injury to the small bowel mesentery or mesocolon, with subsequent bowel infarction, occur<sup>(1-4)</sup>.

On review of the literature, we found four reports on such isolated injury. Bolton<sup>(5)</sup> reported on 59 patients who had undergone laparotomy for blunt abdominal injury between 1966 and 1972. Only one of them had an isolated mesenteric tear, while the rest had additional one or more associated abdominal visceral injury. Liver injury was the most common associated injury, followed by injury to the spleen, kidney and bowel, in that order.

Another two cases of isolated mesenteric injuries following blunt abdominal trauma were reported by McCollough<sup>(2)</sup>: one was in the mesentery of the terminal ileum and the other in the transverse mesocolon with a severed middle colic artery.

Asbun<sup>(6)</sup> reported on another case of isolated mesenteric tear, with subsequent ischaemia of the ileum, out of eight cases who had laparotomy done. These cases were taken from a series of more than 1,400 seatbelt related injuries over a period of 28 months. Killen<sup>(4)</sup> also reported on one case of isolated small bowel mesenteric tear following a non-penetrating abdominal trauma.

The bowel or its mesentery may be injured by direct compression between the seatbelt and the lordotic lumbar spine. Shearing and decelerating forces also can cause the same injury. This commonly occurs at the junction between its fixed and mobile parts, eg the duodenojejunal junction and the ileocecal region<sup>(2,5-7)</sup>.

The seatbelt sign, which is frequently mentioned in the literature, refers to a mark on the abdominal wall along the strap site. This can vary from mild bruising to haematoma formation to even fat or muscular disruption of the abdominal wall. The surgical importance of this sign is still controversial. However, the absence of this sign, as in this reported case, does not exclude the presence of an intra-abdominal injury, vascular or visceral<sup>(5-7)</sup>.

Clinically, isolated mesenteric injuries present as follows:

- (i) *Immediate* – due to bleeding. Signs of continuous bleeding and peritoneal irritation would be present, making early laparotomy imperative.
- (ii) *Delayed* – due to bowel infarction. The patient may present between 12 hours to 5 days following the injury. Our patient presented with infarcted bowel about 21 hours after injury, and hence falls into this category.
- (iii) *Late* – due to bowel stenosis or adhesion formation. The time of presentation is between 5 to 8 weeks after injury.

The clinical significance of this injury is the delay and difficulty in diagnosis, because there is minimal sign and symptom until the ischaemic bowel becomes gangrenous and peritonitis ensues, or when there is sufficient haemoperitoneum to cause hypotension. The most lethal form occurs when the mesentery has been avulsed with the resulting haematoma being contained retroperitoneally. The abdominal signs then would be minimal and the injury could go unrecognised until hypovolaemic shock sets in<sup>(5)</sup>.

In doubtful cases, a four-quadrant abdominal tap or diagnostic abdominal paracentesis may be used but a negative result does

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Department of Surgery (NUS)  
Alexandra Hospital  
Alexandra Road  
Singapore 0316

S A Buhari, MBBS  
Medical Officer

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not exclude intra-abdominal bleeding, especially when the haematoma is retroperitoneum. Hence this form of diagnostic aid is seldom relied upon by most surgeons.

However, some authors have reported good results with diagnostic abdominal paracentesis. In a review of 304 patients, Bolton et al<sup>(5)</sup> found no more than 4% false-positive and false-negative results. In a smaller series by Perry et al<sup>(6)</sup>, there was no false-negative result in a study on 28 patients.

### CONCLUSION

Isolated mesenteric vascular injury following blunt abdominal injury is rare and only a few cases had been reported. The clinical presentation of this injury can either be immediate, delayed or late and each has a different pathological mechanism. The main difficulty facing the surgeon is the decision to proceed to

laparotomy when signs and symptoms are minimal.

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