RUPTURED INTESTINE IN ARMoured PERSONNEL CARRIER ACCIDENTS

A Report of Two Cases

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SUMMARY: Two cases of uncommon closed intradominal injuries involving rupture of the intestine are described. They illustrate the complicating effect of cerebral injury on diagnosis, and the danger of partial thickness damage to the large bowel. The type of vehicle concerned in the accident has been in service with the infantry for four years, and further cases of this nature may occur. The injury rate could be decreased by the fitting of seat belts for passengers and stabilisation of the contents of the vehicle, both animate and inanimate.

Small intestinal injury is uncommon in closed abdominal injuries: it must be rare for such to occur in patients from each of two vehicles involved in the same crash. Armoured Personnel Carriers were introduced to transport infantry rapidly, and with protection from small arms fire, to the battlefield. Each vehicle carries a section of soldiers. Some are equipped as mobile command posts and are fitted with tables. The FV 432 is the armoured vehicle in use at the present time. Two FV 432's travelling towards each other on a straight road collided at approximately 1300 hours. Four out of five soldiers in one (including Case 1), were severely injured. Three out of eight soldiers (including Case 2), in the second vehicle were injured.

Case reports

Case 1. Pte. C., aged 21 years, the radio operator in a Command FV 432, was sitting in the left side rear-facing seat, "on net". He was rendered unconscious for a few minutes and remembered nothing of the accident. He thought he may have hit the edge of the table fixed to the right wall of the vehicle. On admission at 1400 hours he was conscious, semi-coherent, slightly shocked, bleeding from a laceration of scalp, and vomiting. Blood pressure was 130/90 mm Hg and pulse rate 86 per minute. He responded to questions and his main complaint was of headache. His abdomen was soft with no guarding but with vague tenderness; there was a linear bruise across the hypochondrium and the epigastrium. Bowel sounds were present. X-rays of skull and abdomen were normal. He was admitted for observation. By 1530 hours he complained of severe abdominal pain and the pulse rate had risen to 95 per minute. The abdomen then showed board-like rigidity with marked tenderness, and bowel sounds were absent. A laparotomy was obviously needed. The abdomen was explored through an upper midline incision and copious bile-stained brown fluid was seen.

The jejunum had a one-inch tear, nine inches from the duodeno/jejunal flexure. The peritoneum alongside the second part of the duodenum was torn for approximately two inches, a traumatic Kocher's manoeuvre. The duodenum and bile duct were intact. Only a small amount of blood was oozing. There was a two-inch triangular tear, apex superiorly, of the serosa and muscle covering of the descending colon, which had been

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stripped downwards leaving the bruised mucosa exposed. The lesser sac, pelvis, liver, spleen, kidneys were normal. The longitudinal laceration of jejunum was sutured transversely in two layers. The colon flap was sutured back; the descending colon was mobilised and exteriorised in the left iliac fossa because of the flap's doubtful viability.

Postoperatively, hourly gastric aspiration was carried out, intravenous fluids were given, and progress was uneventful for forty-eight hours. The patient then collapsed due to inhalation of vomit. After bronchoscopy and tracheostomy by Lieutenant-Colonel D. Russell, general progress was satisfactory. The apical portion of the colon wall flap was dead and was removed with diathermy leaving an open colostomy.

Case 2. Pte. M., aged 20 years, was number four rifleman in a section and was lying down, asleep, on the right rear seat of the second FV 432. He remembered nothing of the accident "next thing I knew I woke up in hospital". He was admitted to Krankenhaus St. G. The report from that hospital read:—

"Re Pte. M., admitted on 17 Oct 66—discharged on 25 Oct 66. On examination: Multiple lacerations of face. Obvious shock. Abdomen: Abdominal muscles very tense, considerable tenderness on pressure of (R) and (L) upper part of abdomen. Diagnosis: Internal injury of abdominal cavity; lacerations of face. Laparotomy performed under general anaesthetic by an upper median incision following initial shock therapy. Spleen and liver intact. After the small intestine was pulled out, a transverse wound was discovered in its middle portion which divided three-quarters of the small intestine down to the mucous membrane. The wound extended to the mesentery which again was severed to the root of the mesentery. The serosa and mesentery were both sutured. The whole of the small intestine was pulled out and inspected for further injuries. As no further changes were detectable, the intestine was replaced. There was copious blood below the injured part in the small intestine."

His abdomen still showed a linear bruise across the epigastrium and left hypochondrium on transfer to the British Military Hospital.

Discussion

Closed injuries of the intestine are uncommon, and early diagnosis is difficult (Solheim, 1963), but essential if mortality is to be reduced. In both cases there were tears of the small intestine at approximately the same site. This is a most unusual coincidence. In Case 1, the torn peritoneum lateral to the second part of the duodenum, a traumatic Kocher's manoeuvre, is an extension of a paraduodenal haematoma mentioned by Cooke and Southwood (1964). The duodenum had been mobilised by a shearing force which was a factor in the gastric dilation seen after forty-eight hours. The damage to the large intestine illustrates the difficulty of diagnosis in this type of lesion. As the mucosa was devitalised but intact, rupture would have been delayed for several days. This Cooke and Southwood described as "One of the most sinister of abdominal injuries. Physical signs may not indicate the need for exploration (though the kind of force may suggest it); some days later when the patient may have left hospital, the bowel may disrupt." The lesson to be learnt is that there must be a high index of suspicion. Another lesson demonstrated was the effect of the concomitant cerebral injury overshadowing the intra-abdominal injury. The diagnosis depends on the observation of basic physical signs, as little help will come from the laboratory or X-ray (Leading Article, 1966, Clarke, Badger and Sevvitt, 1959).

Description of the kit inside one of the FV's 432 as given by one of the patients showed faulty loading of equipment—"Rifles on floor; large packs, small packs, cookers, water cans, gas masks, compo rations in alcoves above seats; ammunition under seats". Such unsecured objects are potentially lethal, particularly if, for example, a vehicle has to cross rough ground or is involved in an accident.

Both cases could have been prevented by the use of seat belts, as Gissane (1963) has advocated so often in his analyses of road traffic accidents.

Under combat conditions, there may be a need for troops to leave vehicles rapidly, either as a pre-planned operation, or in emergency, but equally important is the need for them to arrive at the debussing point uninjured. The modern seat belt has an efficient quick release mechanism to facilitate such rapid evacuation.

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