Softball injury causing haemoperitoneum due to ruptured Meckel’s mesodiverticular band

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Abstract
A 16-year-old male sustained an intra-abdominal haemorrhage after diving for last base during a softball game. At laparotomy a ruptured patent mesodiverticular band supplying a large Meckel’s diverticulum was found. Traumatic rupture of a mesodiverticular band leading to massive intra-abdominal haemorrhage is a rare event, and has never been reported as a single injury or in the context of a sport’s injury.

Case report
A 16-year-old male dived for third base and then again for last base during a softball game. Following the game he developed gradually worsening abdominal pain. On arrival at the emergency department, he was tachycardic at 110 bpm with a blood pressure of 112/98 mmHg. His initial haemoglobin was 142 g/L.

On examination, his abdomen was diffusely tender. FAST demonstrated the presence of free fluid and a CT was performed. CT showed a large volume of intraperitoneal blood and a sentinel blood clot in the right iliac fossa which in retrospect is surrounding a Meckel’s diverticulum (Figure 1). No solid intra-abdominal organ damage was identified.

Figure 1. Axial CT slice of Meckel’s diverticulum within the right iliac fossa surrounded by blood clot
An explorative laparotomy was performed and the bleeding point was identified as an avulsed medium-sized artery arising from the small bowel mesentery and supplying a large Meckel’s diverticulum (Figure 2).

Haemostasis was achieved by ligating and excising the vessel and the Meckel’s diverticulum. Histological examination revealed an antimesenteric Meckel’s diverticulum measuring 45×35 mm with a small focus of gastric mucosa. The patient made an uncomplicated postoperative recovery.

Figure 2: Intraoperative photograph of avulsed Meckel’s mesodiverticular band and Meckel’s diverticulum

Discussion

Meckel’s diverticulum is the most common gastrointestinal congenital anomaly, occurring in approximately 2% of the population.\(^1\) Meckel’s diverticulum occurs when the omphalomesenteric or vitelline duct fails to completely obliterate during development.\(^2\)

The vitelline duct is initially supplied by the vitelline arteries, branches of the abdominal aorta. A remnant of the right vitelline artery may remain as a mesodiverticular band extending from the small bowel mesentery to supply the Meckel’s diverticulum. Approximately 10% of Meckel’s diverticula are associated with mesodiverticular bands, and these are usually the only blood supply to the diverticulum.\(^3,4\)

Traumatic bleeding from a Meckel’s mesodiverticular band has been reported twice following road traffic accidents, but never from a sports injury, or as a single injury.
Kazemi et al reported bleeding from the mesodiverticular band associated with rupture of the Meckel’s diverticulum in a 36 year old man involved in a road traffic accident.\(^5\)

In another road traffic accident, a bleeding mesodiverticular band was found to be responsible for one litre of free blood in the peritoneal cavity at laparotomy.\(^6\) This patient also sustained a closed head injury and a spinal cord contusion.

Diving for a softball base onto a hard grass surface ruptured the vascular mesodiverticular band without causing damage to any other intra-abdominal organs. Athletes competing in other sports involving diving to the ground may be at risk of developing similar injuries. The force applied to the abdomen when diving may be similar in nature to that experienced by people wearing seatbelts in road traffic accidents.

A trauma CT was unable to precisely identify the origin of the haemorrhage, although bleeding from a right sided mesenteric artery was thought likely to be responsible for the appearance. A ruptured Meckel’s mesodiverticular band could be considered in cases with a similar mechanism of injury where a clear bleeding point cannot be identified on CT.

This is the first report of a sport’s injury causing rupture of a mesodiverticular band, and the first report of any rupture of a mesodiverticular band as the sole traumatic injury sustained.

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