

Case Report

A rare case of Small Bowel Rupture due to a Richter-like hernia following a pelvic fracture

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Abstract

Background. Pelvic fractures are severe injuries often associated with multiple systematic injuries. The most common related complications are: bleeding, retroperitoneal hematoma, other intra-abdominal and urogenital injuries. There are also rare types of pelvic fracture complications such as ureteral obstruction, bowel entrapment, external iliac artery injury and open scrotal sac injury. Traumatic hernias on pelvic injuries sites are an extremely rare entity.

Case presentation. A 79-years old woman was admitted to the Accident and Emergency Department suffering from a left pubic rami fracture with active retroperitoneal bleeding from the left obturator artery following a fall from her own height. Bleeding was managed with intravascular embolization. Her initial uneventful clinical course was discontinued by relapsing episodes of bowel obstruction and eventually lethal septic syndrome due to bowel perforation due to a Richter-like-hernia as it turned out. Despite rescue laparotomy during which an enterectomy, lavage and laparostomy were performed the patient passed out in the midst of decaying multiple organ failure syndrome.

Conclusion. Traumatic hernias associated with pelvic fractures complicated with bowel entrapment, is a rarity. Although there are few reports for bowel entrapment into traumatic cavities of such hernias, the presence of Richter-like traumatic hernia has no record in the literature until today. Every surgeon dealing with trauma should be aware of the existence of such a rare complication and have a low threshold for early surgical intervention.

Keywords: traumatic Richter's hernia, rare pelvic fracture complications, bowel perforation.

Introduction

Pelvic fractures are often caused by high-energy injuries such as those suffered in traffic accidents and fall and account for 5%-8% of all fractures. Common complications of pelvic fractures comprise of visceral injury, hemorrhage, genitourinary injury and pulmonary embolism. Trauma induced herniation is rare, especially in association with pelvic fractures and might have a potentially lethal course thus early diagnosis and targeted treatment is crucial.¹

The first report of a Richter's hernia was attributed to Fabricius Hildanus in 1606.² (Figure 1) The description of that case, in his own saying, translated from the original Latin origin, goes as follows:

"Gangrene resulting from an intestinal hernia with perforation and subsequent cure".³

A Richter's hernia is defined as an abdominal hernia, in which only part of the circumference of the bowel is entrapped and strangulated in the hernia orifice. (Figure 2) Although, almost any part of the gastrointestinal tract has been reported in Richter's hernias cases, it is the distal ileum that is affected mostly.⁴⁻⁸ August Richter, who first described this condition, states that the precondition for the formation of this type of herniation is determined by the size and consistency of the hernia orifice. (Figure 3) It must be big enough to ensnare the bowel wall, but small enough to prevent protrusion of an entire loop of the intestine, and the margin of the hernia's ring must be firm or, in Richter's words, "possess strong spring-force".⁹ Richter's hernias tend to progress more rapidly to gangrene than ordinary strangulated ones.¹⁰



Figure 1. Fabricius Hildanus (1560-1632)

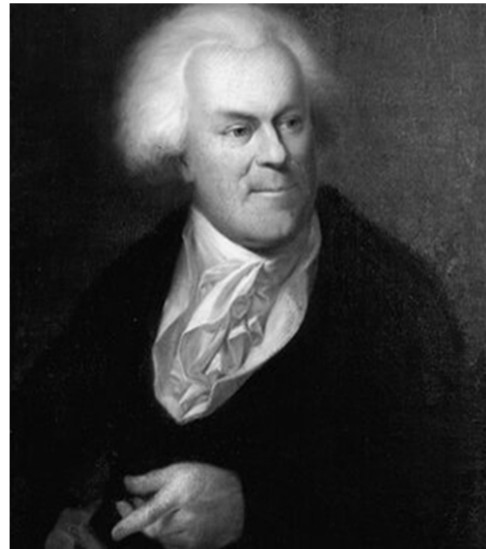


Figure 3. August Gottlob Richter (1742-1812)

Apart from Richter's hernia, that which is a rare entity, there are many other more commonly known causes of small bowel perforation encountered in everyday clinical practice. Among others, the most frequent are erosions from duodenal ulcerations, tumors, infection or abscess, Meckel's diverticulum, hernia with strangulation, inflammatory bowel disease, mesenteric ischemia, foreign bodies, obstruction, medication or radiation related causes, iatrogenic ruptures and trauma.¹¹

In this case report we describe a very rare case of small bowel perforation due to a Richter-type-herniation through a non-anatomical hernia orifice, created by a pubic bone fracture, following a fall from own height. Reviewing of the literature detected few similar cases, but none referring to a Richter's-like traumatic hernia incarceration of small bowel.

Case report

A 79-years old woman presented at the emergency department of our hospital after a fall from her own height. Her medical history consisted of atrial fibrillation and severe degree mitral valvular disease. She was on acenocoumarol in a dose of 2 mg/OD. On presentation she was unable to stand up and was experiencing severe pain in the pelvis and lower abdomen. When she arrived in the

emergency department, the vital signs were: BP 100/70mmHg, HR 110/min, SpO2 98%. On admission blood count revealed an Hgb of 9.3 mg/dl. Following resuscitation with crystalloids, x-rays showed a pubic bone fracture on the left side. (Figure 4) Repetition of blood count pointed out a drop in Hgb to 8.1mg/dl. The patient was transfused with RBCs and a CT-scan revealed extensive hematomas spreading throughout the pelvic floor, the left obturator muscle and adjacent extraperitoneal area. Active bleeding from the left obturator artery was detected and managed with trans-arterial coils embolization. Following proper resuscitation, the patient was admitted to surgical department.

After seven days of hospitalization, the patient presented with symptoms and signs indicative of bowel obstruction (vomiting, abdominal distention) primarily treated conservatively: placement of nasogastric tube, IV fluids, antibiotics, painkillers, metoclopramide and low-molecular weight heparin. Ileus was initially attributed to prolonged bedrest and retroperitoneal haematomas. Although bedridden due to pelvic fracture, she gradually resumed oral liquid diet passing flatus her bowel partially recovering from paresis.



Figure 3. Pelvic X-Ray showing the left pubic bone fracture.



Figure 4. CT scan demonstrating subcutaneous emphysema along with presence of orally contrast agent between the abdominal wall layers.

Ten days later ileus relapsed. She also had a septic profile with fever, elevated white blood cell counts, CRP and atypical abdominal pain without Bloomberg's sign. There was remarkable palpable crepitus consisted with subcutaneous emphysema, especially in the right side of the abdomen. A CT-scan revealed distended small bowel loops, fluid collections in the pelvic floor and in between abdominal wall layers, especially in the left side, and alarming presence of free air within rectus sheath bilaterally. (Figure 5) Based on the aforementioned clinical and radiological findings, an emergency exploratory laparotomy was decided.

While abdominal wall was incised in the middle line, fecal-purulent material gashed from concomitant anatomic wall layers. A Richter-like hernia was discovered inside a cavity created in the abdominal wall by the pelvic fracture. A non-anatomical orifice had been created by the bone fractural spur entrapping and strangulating tangentially half of the circumference of a bowel loop. (Figure 6) The bowel became ischemic in its strangulated length, perforated and its content spilled within the abdominal wall layers, especially between the peritoneum and the transversalis fascia (Fig. 7). Surprisingly, the intraperitoneal cavity was free of any contamination or peritonitis.

A segmental enterectomy and side-to-side anastomosis with staplers was performed, as also

meticulous lavage of the contaminated areas. A laparostomy with a Bogota-bag technique was performed and vacuum drains were placed in the affected cavity, for daily cleaning care of the abdominal wall and prevention of abdominal compartment syndrome. The patient was transferred to the intensive care, but unfortunately, she passed away in the 10th postoperative day, due to irreversible multiple-organ failure syndrome.

Discussion

The definition criteria of traumatic hernia proposed by Clain in 1964 are as follows: 1) the hernia must have appeared immediately after trauma and 2) the patient must have consulted a doctor soon enough for signs of the trauma to be identifiable¹². However, many cases that did not fulfill these criteria have subsequently been reported.

Therefore, Sahdev proposed new criteria of traumatic hernia in 1992 as follow: 1) the patient has no history of any hernia, 2) it is obvious that the patient has suffered an injury, 3) the appearance of herniation can occur even at a delayed stage after trauma, and 4) a hernia sac can be present¹³. Our case apart from the hernia sac meets all of the above criteria.



Figure 5. Intraoperative picture demonstrating the newly formed extraperitoneal cavity, due to the pelvic fracture.



Figure 6. Intraoperative picture demonstrating the perforated Richter's hernia.

Sir Frederick Treves, the famous London surgeon, who saved King Edward VII's life, when he was diagnosed with appendicitis, distinguished Richter's hernia from herniation of a Meckel diverticulum, which was classically described by Littré.¹⁴ Treves credited Richter with the distinction of having given the first scientific description of this particular lesion and suggested the term that we all use today.¹⁵ For more than 100 years there was a great confusion among surgeons about the nomenclature of these hernias. They were described without a specific term or special name or were categorized with Littré's hernia.

Little new information has been added since then and the reports of Treves remain classic and stand still in time.¹⁶⁻¹⁷ Approximately, 10% of strangulated hernias are Richter's hernias.¹⁸⁻¹⁹ The diagnosis may be difficult due to lack of specific symptoms and signs and may remain presumptive even after imaging workup, until clearly confirmed intraoperatively.

Dull abdominal pain, slight malaise, nausea and vomiting may be the first symptoms rather vague than severe in quality because underlying bowel obstruction is rarely complete (tangential entrapment of bowel loop thus allowing part of the lumen patent). Local signs may be absent and if present are easily overlooked.¹⁶

The most constant physical finding remains the tenderness or swelling over a potential hernia orifice. In neglected or overlooked cases, where surgery was performed after days or not at all, with perforation of the strangulated part of the bowel, the outcome may be devastating and lethal for the patient, due to gangrene and high toxin load. The good clinical scenario for the patient is the formation of an enterocutaneous fistula, which was first described from Hildanus in 16062, as there is no contamination in the intraperitoneal cavity and peritonitis.¹⁵⁻¹⁸

However, in the case of our patient, the traumatic hernia led to the development of a

“blind” fistula between the abdominal wall layers and especially between the peritoneum and transversalis fascia. A significant quantity of fecal material accumulated between abdominal wall layers before a septic syndrome became apparent. A broken pubis led to the formation of a non-anatomical new space or “orifice”, where the anti-mesenteric border of a loop of the terminal ileum was incarcerated extraperitoneally. Although the time of the incarceration could be combined with the first symptoms of ileus at the 7th day of hospitalization, it was only when the perforation and the septic profile of the patient ten days after (fever, abdominal pain, metabolic acidosis, slight tachycardia, slight fall of blood pressure, elevated WBCs and CRP) dictated the need for exploratory laparotomy.

Conclusion

In most cases, pelvic fractures follow a predictable course and heals uneventfully. Traumatic hernia following pelvic fractures is a rare complication, which can lead to bowel entrapment and perforation extraperitoneally. Since Richter’s hernia is more difficult in diagnosis, a traumatic Richter’s-like hernia will reveal late symptoms of bowel necrosis and perforation, as described in our case. A high clinical suspicion of this entity may lead to early surgical exploration and prevent severe complications, which may result in an unfortunate loss of life.

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