Iliopsoas Hematoma and Abscess Formation as a Complication of an Anterior Abdominal Penetrating Injury: a Case Report and Review of Literature

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ABSTRACT

Background: Abdominal stab wounds are common in clinical practice. However, the development of psoas muscle abscess following such an injury is extremely rare. Moreover, literature surrounding psoas muscle hematoma formation as a consequence of penetrating abdominal injury is scarce. Objective: We report a case of psoas abscess formation following the development of psoas hematoma in a patient who suffered from a penetrating abdominal injury. Case presentation: A 40-year-old Indian male presented to the Emergency department with multiple abdominal cut and stab wounds as a result of physical assault. A computed tomography scan revealed injuries to the ascending colon along with hemoperitoneum and right psoas muscle hematoma. Exploratory laparotomy was performed in which a right hemicolectomy and a right psoas muscle evacuation were successfully achieved along with multiple drainage tubes placed. Six days later, a peritoneal fluid culture tested positive, and a computed tomography scan revealed right psoas muscle collection which was diagnosed as an abscess. Treatment of the abscess included antibiotics and ultrasound-guided drainage. Patient was eventually discharged but was lost to follow-up. Conclusion: The development of iliopsoas abscess and hematoma as a consequence of abdominal penetrating injuries is a rare occurrence. Diagnosis can be made by computed tomography imaging and examination of the drained fluid. Managing a case with both of these rare phenomena can be challenging due to the scarce literature highlighting and comparing the different management modalities.

Keywords: Hematoma, psoas abscess, penetrating wound.

1. BACKGROUND

Traumatic injuries are one of the top causes of mortality globally with an estimated 5.8 million people dying annually (1). Consequences of stab injuries can be devastating and life-threatening. Internal organs or major vessels can be damaged by penetrating stab wounds, whether homicidal or suicidal, resulting in life-threatening infections, shock, and even death (2). Direct impact injuries, either penetrating or nonpenetrating, to the muscle and myotendinous junctions occur often in young adults (3). Despite this, the incidence of iliopsoas hematomas as a complication is rare (0.1% to 0.6%) (4). A well-known fact in clinical practice is the possibility of infection occurring following penetrating injury, but the development of an iliopsoas abscess as a consequence of abdominal stab wounds is extremely rare (5-6).

2. OBJECTIVE

The aim of this article was to report a case of psoas abscess formation following the development of psoas hematoma in a patient who suffered from a penetrating abdominal injury.

3. CASE REPORT

The patient is a 40-year-old Indian male. He has no previous medical or surgical history and no relevant family history. He presented to the emergency department with a single stab wound in the anterior abdomen caused by...
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Case Report

A large knife after a physical altercation. There was no active bleeding from the wounds and there was no history of chest pain, shortness of breath, and loss of consciousness. His vital signs were stable. Focused assessment with sonography in trauma was performed which came out negative. On examination of the abdomen, one deep stab wound could be seen located in the lower right abdominal quadrant. The wound was associated with bowel evisceration (Figure 1A). There were no signs of hematoma nor compartment syndrome. Primary and secondary survey were carried out and no other injuries were detected.

A preoperative computed tomography (CT) scan with intravenous contrast revealed a deep penetrating injury to the medial aspect of the right lateral abdominal wall penetrating both the external and internal oblique muscles and the transverse muscle. Other findings included both a superficial hematoma and an intraperitoneal hematoma tracing around the proximal ileal loops and the ascending and transverse colon that was associated with stable hemoperitoneum. A right psoas hematoma (Figure 1B) was noted that was suspected to be active extravasation in the venous phase from branches of the lumbar vessels.

The patient underwent emergency exploratory laparotomy shortly thereafter. Intraoperatively, three penetrating injuries to the cecum that were going through and through were discovered along with a right para-

bolic gutter hematoma and a retroperitoneal hematoma with fecal contamination. Right hemicolectomy with primary anastomosis was performed. The retroperitoneum was explored through an opening over the hematoma on the right side which revealed a right psoas muscle injury (Figure 2). The hematoma was evacuated, and intraoperative evaluation of the psoas muscle showed no active major bleeding. There was, however, minimal oozing that was controlled by compression and the use of hemostatic dressing. A drain was left inside, and two other drains were placed in the pelvic and right paracolic gutters. The urology team assessed for any ureteric injuries for which none were detected. The laparotomy incision was closed in the usual manner.

The patient was evaluated daily, and he was showing clinical improvement. He was able to tolerate a full diet and was only complaining of mild back pain. Laboratory investigations showed significant improvement in his C-reactive protein level which decreased from 25.5 mg/dl to 11.7 mg/dl. His white blood count remained within the normal limits throughout his admission and was ranging from 6.2 to 7.5 K/ul. Six days after the operation, a peritoneal fluid culture tested positive for Pseudomonas aeruginosa, Escherichia coli, and Enterococcus faecalis. The infectious diseases team recommended the use of meropenem. Consequently, a CT scan of the abdomen was ordered. It showed a partially walled-off collection measuring 6.7 x 4.3 x 7.9 cm, the majority of which was embedded within the right psoas muscle. A CT urogram (Figures 3A-3B) was performed on day 10 of admission to rule out urine leak from the right ureter which showed an increase in the size of the previous-
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ly detected right psoas muscle collection that displaced the ureter anteriorly without disrupting its patency and without leakage of urine nor contrast. On day 11 of admission, an ultrasound-guided pigtail tube was later placed for drainage of the right psoas collection, and it drained well without any complications.

On day 17 of admission, a CT scan of the abdomen (Figures 4A-4B) was performed which showed regression of the right psoas muscle collection along with a decrease of its mass effect on the right ureter. The patient was being evaluated both clinically and by his laboratory values. He showed improvement and was tolerating a full diet, passing bowel motion, and mobilizing fully. All inflammatory markers were decreasing and returned to within the normal limits. A multidisciplinary team meeting was conducted with all relevant teams and after taking the patient’s own perspective and wishes into account, a decision was made to discharge the patient. He was discharged on day 19 of admission along with a prescription of oral antibiotics targeting the results of the latest culture result which was positive for Escherichia coli and sensitive to amoxicillin/clavulanate. The patient was lost to follow-up as he returned to his home country of India.

4. DISCUSSION

Despite road traffic accidents being the leading cause of mortality in trauma patients, penetrating trauma caused by gunshot or stab wounds is a huge healthcare burden in various parts of the world (2). The most prevalent locations of stab wounds vary considerably in literature. In some studies, stab wounds to the chest and abdomen were the most prevalent whereas stab wounds to the upper extremities were the most common in oth-

Figure 3. (A) Coronal view of a CT urogram showing an increase in the size of the right psoas muscle collection (Green asterisk). (B) Axial view of a CT urogram showing displacement of the right ureter anteriorly (Green arrow).

Figure 4. (A) Axial view of a CT scan of the abdomen showing regression of the right psoas muscle collection along with a decrease of its mass effect on the right ureter (Red arrow). (B) Coronal view of a CT scan of the abdomen showing the pigtail drainage tube placed (Green arrow).
ers (7-9). The overall mortality rate of stab wounds was estimated to be between 2-8% (10).

Few studies describe traumatic iliopsoas hematomas caused by physical trauma or muscle tear, and most of the cases of iliopsoas hematomas described were caused by spontaneous bleeding (11-14). Prior to the invention of computed tomography scanning, traumatic psoas hematoma went frequently unnoticed or was only discovered post-mortem. Despite psoas hematomas being a well-known consequence of coagulopathy, those induced by trauma have been reported in few cases (15-17). A 2008 study conducted in Doha, Qatar revealed that traumatic psoas hematomas were detected in 25 out of the 1875 patients hospitalized in the trauma service. CT scans performed at the time of admission were used to diagnose these 25 cases and the mechanism of injury for all of them was blunt trauma (18).

In 1992, the average global incidence of iliopsoas abscess was estimated to be 12 cases annually, but the exact number of cases is unclear currently (19-20). There have been some similar reports in literature showing an association between stab wounds and the formation of iliopsoas hematoma and abscess. Yu et al reported a case of iliopsoas hematoma following a stab wound to the back which was managed by removing the foreign body and irrigation (21). The approach to diagnosing such a condition is difficult due to the clinical signs’ polymorphism and non-specificity, and it usually carries an unfavourable prognosis (22). One other possible cause of the abscess formation in our patient is the emergency exploratory laparotomy with hemicolectomy that he had to undergo as few cases of iliopsoas abscess secondary to colonic pathology have been reported in literature. Rusceli et al reported two cases of iliopsoas abscess secondary to colonic perforation and in both cases the patients were of old age, and they were both managed with exploratory laparotomy with left hemicolectomy and abscess drainage (23). Blood chemistry laboratory findings will most likely be inconclusive and thus CT scans can be utilized to aid in the diagnosis, and microbiological investigation of the drainage product can be used to confirm the diagnosis (24). Traditional treatment options include antibiotics, image-guided drainage, and/or open surgical drainage (19).

5. CONCLUSION

Penetrating abdominal injuries have a high risk of complications such as postoperative infection. However, abscess formation following the development of iliopsoas hematoma as a result of abdominal stab wounds is extremely rare and and high index of suspicion is needed in order to reach a diagnosis in a timely manner. The diagnosis of this condition relies on imaging such as computed tomography scanning and examination of the drained fluid. The best method of treatment of this phenomenon is yet to be studied and determined owing to its rarity.

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