



Three patients with acute appendicitis diagnosis following blunt abdominal trauma

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Abstract

Objective: One of the most prevalent surgical emergencies is appendicitis, caused by different factors. However, its relation to trauma has not been well-known yet. Here we have described three cases with blunt abdominal trauma and a secondary diagnosis of appendicitis that were transferred to the operation room.

Case Presentation: Three patients suffering from blunt trauma and abdominal pain were referred to the emergency department (ED). Of these patients, one of them was transferred to the operation room (OR) with a peritonitis diagnosis and the other two patients had appendicitis signs and symptoms. The abdominal pain and related signs and symptoms of these three patients were due to appendicitis. All three patients were discharged from the hospital with normal vital signs.

Conclusion: Traumatic appendicitis might be regarded as one of the differential diagnoses of the patients referred to the ED with blunt abdominal trauma and abdominal pain; hence, appendicitis and blunt abdominal trauma have some unknown relations.

Keywords: Appendicitis, Abdominal Injuries, Case reports

Introduction

Acute appendicitis (AA) is considered as one of the most prevalent gastrointestinal diseases, and 5.7-57 per 100 000 individuals suffer from it annually. AA is more common among children and adolescents (1-3). Furthermore, the most common abdominal surgical emergency is appendicitis, with an estimated risk of 7% throughout life. The leading cause of the AA is claimed to be the obstruction and blockage of the proximal lumen (4). Obstruction of the appendix lumen due to several unknown factors, such as foreign body, endometriosis, appendicolith, leukemia, and intestinal parasites, are among the main mechanisms of its pathophysiology. Emotional stresses may also be considered a non-obstructive and rare etiology of appendicitis (5-7).

Trauma is the main cause of morbidity and mortality worldwide and the most probable cause of death until the age of 40 (8). Moreover, one of the most frequently injured regions is the abdomen, and 25% of all abdominal traumas require an abdominal exploration (8). A study

reported twenty-eight cases of patients with blunt abdominal trauma and appendicitis previously. However, its coincidence is considered rare (5). We have described three cases with blunt trauma to the abdomen and a secondary appendicitis diagnosis, that were transferred to the operation room.

Case Presentation

Case 1

A 30-year-old man suffering from pelvic fracture due to multiple trauma and car rollover was hospitalized in another center. The patient felt pain in his right lower quadrant (RLQ) of the abdomen on the second day of admission. He had received painkillers and sedatives due to the pain of the superior right pubic ramus bone. He was referred to our hospital for pelvic surgery. At the arrival time, the patient had pulse rate (PR): 110 and temperature: 39°C. He had generalized abdominal tenderness on initial examination. The laboratory values were: white blood cell (WBC): 8600 and neutrophil:



86.5%. Therefore, he was transferred to the operating room (OR) with a differential diagnosis of peritonitis. The entire abdominal space was filled with pus due to perforated appendicitis, and no other pathological cause was found. After washing and appendectomy, the surgery was finished. The histopathological report confirmed the acute gangrenous appendicitis with periappendicitis, and the patient was discharged with normal vital signs in good condition.

Case 2

An 18-year-old male had fallen from a three meters height. On the first day of admission, the patient had no abdominal pain, but on the second day, he started to feel pain in the RLQ of his abdomen. He had tenderness and rebound tenderness on physical examination of RLQ. He also complained of nausea and vomiting. The patient's vital signs were PR: 90 and temperature: 37.2°C, and the laboratory tests were: WBC: 15000 and neutrophil: 83%. He was transferred to the operating room. An appendectomy was conducted through an incision at McBurney's point. The pathology of appendicitis has also confirmed the diagnosis of appendicitis. He was discharged from the general surgical service within two days with normal vital signs.

Case 3

A 38-year-old man presented to the ED with multiple trauma due to a motor car accident. The patient had PR: 86 and temperature 37.3°C. He had pain in his umbilical area just after the accident. His progressive pain shifted toward the RLQ with a tenderness and a rebound tenderness on examination. His tests showed the WBC: 10800 and neutrophil: 84%. Therefore, he underwent an appendectomy with appendicitis diagnosis. The patient's pathological report showed acute gangrenous appendicitis with periappendicitis, and the patient was discharged with normal vital signs.

Discussion

AA following blunt abdominal trauma is not common, and in a systematic review, 28 cases with appendicitis following blunt trauma were reported between 1991-2009 (4). Moreover, several case reports discussed the same situation (9-11). However, no prospective study has investigated the relation and pathophysiology of appendicitis after blunt trauma. Although intestinal injury due to blunt abdominal trauma is frequently reported, the frequency is 5%-15% (12).

The exact relation between appendicitis and abdominal trauma has not been clearly identified. A study on rabbits resulted in edema, hematoma, hyperplasia of lymphoid tissue, and subsequent obstruction of their appendixes after blunt trauma (13). However, another study indicated that the direct trauma did not affect the rabbits' appendixes (14).

Some researchers have considered this association to be coincidental. This could be reasonable since the frequency of both trauma, and AA is high among the specific population, such as adolescents. Others have demonstrated that appendicitis might precede trauma, and its symptoms might increase the risk of concussion. Hence, physicians should consider that the appendicitis signs and symptoms might cause the trauma. The third theory revealed that the blunt abdominal trauma might initiate the obstruction and subsequent inflammation of the appendix. The pathophysiology that may cause appendicitis is an increase in intra-abdominal pressure in traumatic patients and reduction of visceral arterial pressure, leading to appendix edema and appendicitis (5,15). Another study also indicated that bleeding might result in hypoperfusion that reduces the visceral arterial pressure and subsequently can lead to appendicitis (15). This process can justify appendicitis of case one in the present study. However, there is no justification for the other two patients.

Several criteria have been postulated for appendicitis with traumatic etiology, including no abdominal pain before the trauma, direct trauma or a severe and acute unpredicted indirect trauma to the abdomen, persistent/progressive symptoms confirmed with surgery, and an interval of 6–48 hours after trauma (5,16). All the cases of the present study had met the mentioned criteria.

Given that there were 28 cases in previous studies between 1991 and 2009 (nearly 20 years) (4), three traumatic appendicitis cases in 10 months with unknown causes were referred to our hospital; hence, appendicitis must be considered as a probable cause of abdominal pain in traumatic patients.

Conclusion

Here, we reported three patients referred to the hospital with blunt abdominal trauma that were finally diagnosed as AA. It seems that appendicitis and blunt abdominal trauma have some unknown relations, and further studies should clarify it. Moreover, it is also recommended that abdominal pain in patients with blunt abdominal trauma should be considered more seriously in terms of ruling out appendicitis.

Ethical issues

Written informed consent was obtained from patients for publication of this case report and any accompanying images.

Authors' contributions

KhA and HH conceived the presented idea. ShF, PN, and FSh wrote the manuscript in consultation with all authors. KhA, PN, HH, and ShF conceived the study and were in charge of the overall direction and planning. KhA, ShF, HH, and PN were directly involved in the treatment plan of the patients. All authors discussed the results, commented on the manuscript, and approved the final version.

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