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Atraumatic Splenic Ruptures: Description of Three Cases in One Centre

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1. Abstract

Spontaneous splenic rupture is rare. It is usually associated with various pathologies such as infections, neoplasms, haematological pathologies. Patients often present in the emergency room with abdominal pain and hemodynamic instability without mention of trauma, so the differential diagnosis may be difficult. Laboratory investigations and ultrasound study can direct us towards the right diagnosis. CT scan with Contrast media allows rapid identification of all possible lesions. Failure to consider splenic rupture is associated with high patient mortality. We report three cases of atraumatic splenic rupture. This illustrates the importance of performing a differential diagnosis in patients presenting with acute abdominal pain. Despite the timeliness of the atraumatic spleen rupture, especially in patients with underlying pathologies, it remains a condition with high mortality

2. Introduction

Splenic rupture is mainly caused by trauma. But in some rare cases, it can also occur without obvious trauma, known as atraumatic splenic rupture (ASR) or spontaneous spleen rupture. ASR is often life threatening due to the delay of diagnosis and treatment.

3. Patients and Methods

The primary aim of this study was to describe the experience with atraumatic splenic rupture in a district general hospital. The classification criteria of a splenic rupture was based on the American Association for the Surgery of Trauma (AAST). Baseline data included sex, age, and clinical presentation. Data from laboratory tests, imaging examinations, surgical information, and pathological examinations were also collected. We attempted to reveal the possible etiological factors leading to ASR.

4. Results and Case Series

We selected three patients with ASR between January 2021 and August 2022 and were retrospectively evaluated. These three patients were male aged between 42 and 81 years with three different comorbidities, the mortality was 66%, only one patient survived. the pathologies they suffered from were hiv, antiaggregant drugs for previous ischemic disease , acute myeloid leukemia. Computed tomography confirmed the diagnosis preoperatively in all the cases where it was performed (n=3).

All three patients required intensive care in the intensive care unit, the sole survivor had seven days of hospitalization in our division

4.1. Clinical case n° 1

A 85-year-old man, with medical history of cholecystectomy, bpco, peripheral vasculopathy treated with clopidogrel, arrived at the emergency department complaining of abdominal pain with sudden-onset. On arrival, there was a collapse, blood pressure 80/60mmHg and pulse 125/min, the patient was pale, apyretic and had an abdominal defense. The hemoglobin was at 7 g/dl and WBC at 9000/mm3. After resuscitation measures and transfusion of 2 units of red blood cells transfusions , the patient underwent a contrast-enhanced abdominal CT scan demonstrating the presence

of a grade IV lesion. The patient underwent surgery. During laparotomy, there was a hemoperitoneum related to complete decapsulation and rupture of lower pole of the spleen . The decision was made to proceed to a splenectomy. The patients required intensive care in the intensive care unit with a lenght of stay of seven days . Histological examination confirmed the non-pathological aspect of a decapsulated spleen (Figure 1).

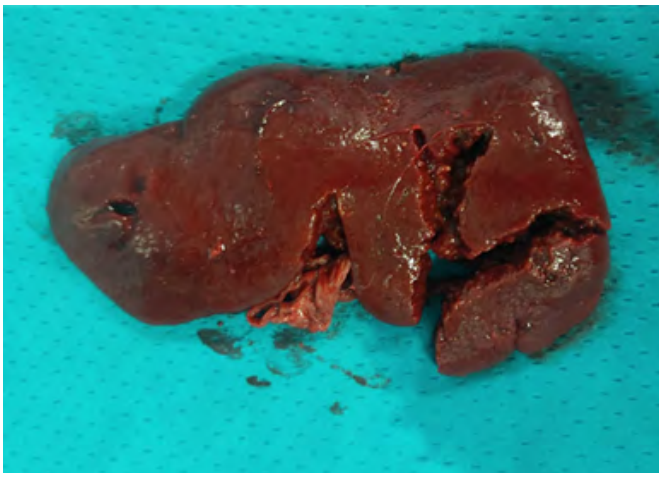

Figure 1:

4.2. Clinical Case n° 2

A 45-year-old male, presented to the emergency department with 3 days of left shoulder and abdominal pain. He reported no history of trauma to the abdomen. HIV infection with a CD4 count of 102 cells/ll had been diagnosed 3 years earlier. Antiretroviral treatment consisting of lopinavir/ritonavir, zidovudine and lamivudine was initiated at that time. On admission, his temperature was 39 C°, blood pressure, 70/40 mmHg, pulse 120/min. Laboratory tests revealed normocytic anemia with a hemoglobin count of 5.4 g/dl and and WBC at 14000/mm3

After resuscitation measures and transfusion of 4 units of red blood cells transfusions, , the patient underwent a contrast-enhanced abdominal CT scan demonstrating the presence of a grade V lesion with completely shattered spleen. The patient underwent surgery During laparotomy, there was a hemoperitoneum related to complete destruction of the spleen with difficult identification and ligation of the splenic vessels; the patients required intensive care in the intensive care unit and died 5 days after surgery. Histological examination confirmed the increase in the number of small to intermediate size lymphoid cells in the red pulp, reactive follicular lymphoid hyperplasia, with numerous secondary lymphoid follicles and reactive germinal centers in the white pulp. T-cell receptor (TCR) gene rearrangement studies demonstrated a positive TCR beta gene rearrangement, without a TCR gamma gene rearrangement, consistent with a clonal CD8 (+) T-cell population (Figure 2).

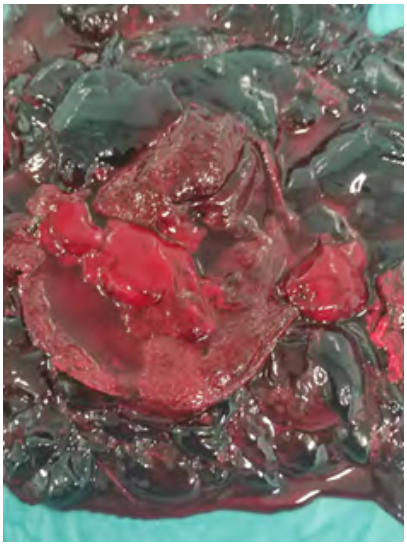

Figure 2:

4.3. Clinical Case n° 3

A 65-year-old male, presented to the emergency with abdominal pain and hemodynamic instability. He reported no history of trauma to the abdomen. seven days earlier he had undergone surgery to remove a skin tumor with a complication of bleeding from the surgical wound. On admission, his temperature was 36 C, blood pressure 80/50 mmHg, pulse 120/min. Laboratory tests revealed normocytic anemia with a hemoglobin count of 5.6 g/dl and and WBC at 40.000/mm3.

The ultrasound examination showed echogenic peritoneal effusion, After resuscitation measures and transfusion of 3 units of red blood cells transfusions,the patient underwent surgery . During laparotomy there was Massive hemoperitoneum with enlarged spleen with multiple splenic growths. Splenectomy with identification and ligation of the vessels of the splenic hilum; The patients required intensive care in the intensive care unit and died 4 days after surgery (Figure 3).

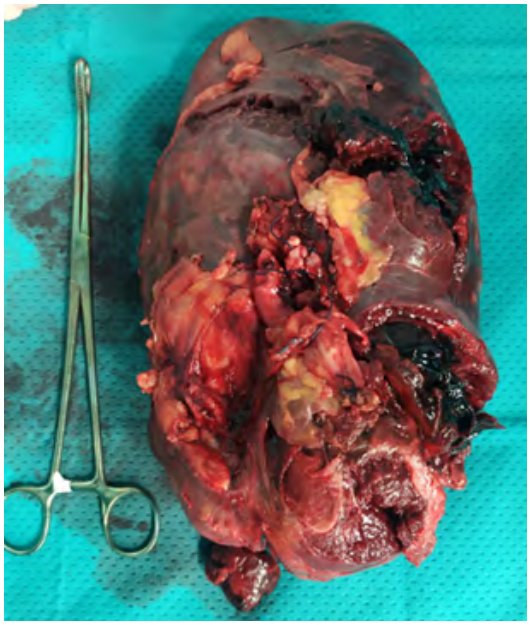

Figure 3:

5. Discussion

Spontaneous splenic rupture was first described in the 19th century 1). There are several nomenclatures describing the rupture of the spleen without trauma, but in our opinion, according to Renzulli et all, "Atraumatic" is more accurate. ASR can be classified as "atraumatic-pathological splenic rupture" if we find pathological changes in the spleen and "atraumatic-idiopathic splenic rupture" if apparently there are no etiological factors and the histological examination was negative 2). The incidence rate of ASR the incidence is variable. In the study of Liu J et al. the incidence of ASR is 3.2% (8/251) with the majority of patients are male as in our case series with a mean age of The age varies from 2 to 81 years (average = 42 years). 3) The mortality is hight, probably due to the diagnostic delay and is estimated between 12.2% and 20% 2)4)5). From the literature, the pathologies associated with atraumatic spleen rupture are various: infections, haematological diseases, other conditions of surgical urgency, use of anticoagulants, covid 19 infection, use of substances such as cocaine, myocardial infarction, pancreatitis; 6)7)8) 9)10)11). Spontaneous rupture of the normal spleen represents a problem in diagnosis. In the absence of trauma, diagnosis a patient with splenic rupture presents with abdominal pain with haemodynamic instabilities that are nonspecific. Urgently ultrasound (US) is the first line examination to rapidly determine the presence of hemoperitoneum without interrupting resuscitation. So, at this stage, the diagnostic objective is not the search for the single lesion organ test, but only the assessment of profuse bleeding. However,contrast-enhanced abdominal CT scan is the gold standard in the differentiation of patients with active splenic hemorrhage. CT defines the grade of splenic lesion, suggests to the surgeon the indication for emergency surgery and in patients with stable or non-bleeding lesions, possible non-operating management to reduce surgical morbidity and preserve immunocompetence.12) In this series, we first performed ultrasonography. Hemodynamically stable the patients performed CT that specified the rupture grade according to AAST. ASR in these case series belonged to grade III, IV and V. Treatment was based on hemodynamics, etiological factors, and CT grading. We performed open splenectomy in all three cases without the laparoscopic approach. Laparoscopic approach can be used but it depends by experience of the surgeon, grade of spleen injury, and hemodynamic stability of the patient 13).

In a hemodynamically stable patient, nonoperative management can be considered for low-grade injuries (grade I–II), for higher-grade injuries (grade III-V) surgery is required. In non-operating management, the overall failure rate varies between 2% and 52% 14)

If surgery is necessary, we suggest, accoding to Renzulli et al., total splenectomy for most ASR. First, a pathological examination of the spleen and other abnormalities is helpful to identify underlying diseases. A total splenectomy does not increase the risk of postoperative infections because in ARS most spleens have no immunological function due to the underlying disease 2)

We suggest according to Jan liu et al not to perform splenorrhaphy but total splenectomy because of the time from onset to surgery is usually long , and the splenic parenchyma could be edematous and more fragile 3)

6. Conclusion

Atraumatic splenic rupture is an uncommon, often misdiagnosed. Treatment generally consists of total splenectomy in anticipation of functional compromise. in centers with interventional radiology, non-operating management can be performed but only in selected cases. however, we suggest performing a total splenectomy if we suspect an underlying pathological condition involving the spleen. histologic examination will help determine whether the rupture is atraumatic-pathologic or atraumatic-idiopathic. the diagnostic delay, in the absence of a trauma, makes this pathology still with a high mortality rate.

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