

Splenic injury following trauma: The role of ultrasonography

Innocent Gerald Makoba, Mbale Hospital
P. O. Box 921 Mbale, Uganda

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Abstract

The spleen is the most commonly injured abdominal organ and this may follow accidental or non-accidental trauma. Three cases are presented of adult males who presented with pain in the left hypochondrium following trauma. Traumatic injury to the spleen was suspected and ultrasound confirmed this suspicion in the 3 patients. The patients did well after splenectomy. Hence ultrasound evaluation of patients with history of trauma and left hypochondrial pain should be performed urgently in order to detect possible splenic rupture.

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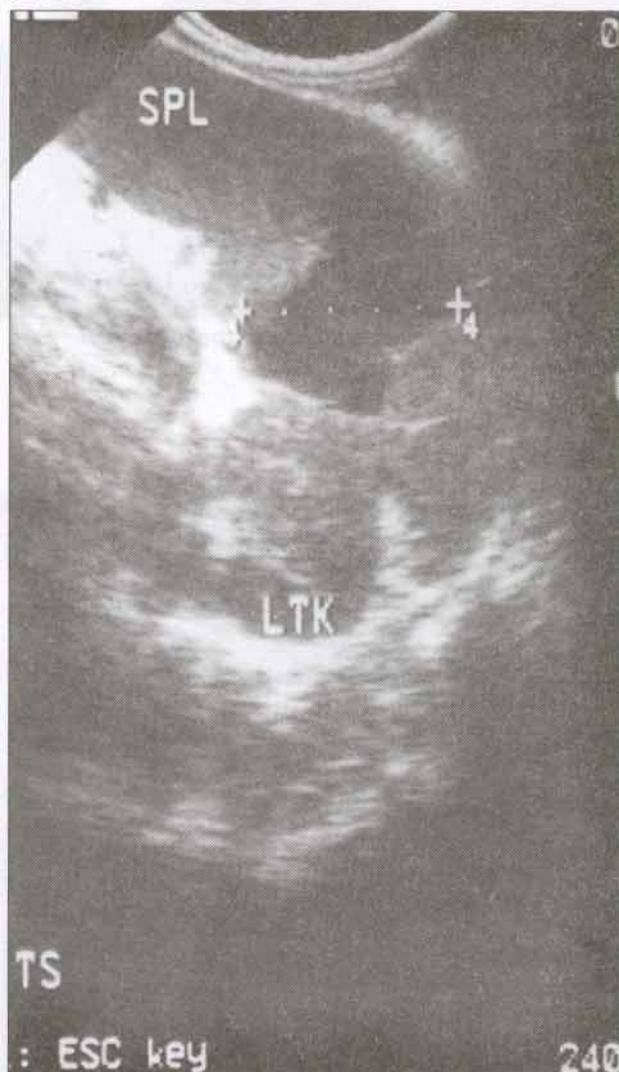
Case I

A 32-year old male Gisu complained of left lower chest pain for one day. This followed assault during which he was hit by blunt object on the left lower chest. Physical examination showed a young man in pain but otherwise in good general condition. There was no pallor or signs of shock. There was tender splenomegaly but no signs of free fluid in the peritoneal cavity. Splenic injury was suspected. Ultrasound findings are shown in figures Ia & b.

Figure Ia



Figure Ib



Oblique and transverse ultrasound scans showed a big spleen (172mm pole to pole) with an irregularly marginated hypoechoic measuring 83mm x 26mm in size. There was no fluid in the peritoneal cavity. The liver, kidneys and pancreas appeared normal.

A sonographic diagnosis of an intrasplenic lesion, most likely an intrasplenic haematoma, was made. Splenectomy was performed the following day in order to avoid further deterioration of the patient's condition. There was no haemoperitoneum at surgery.

Case 2

A 29-year old male Ganda presented with pain in the left hypochondrium for one day. This followed a road traffic accident the previous day. On examination, he was pale and had tender splenomegaly. The abdomen was tender with guarding. The ultrasound findings are shown in figures IIa & b

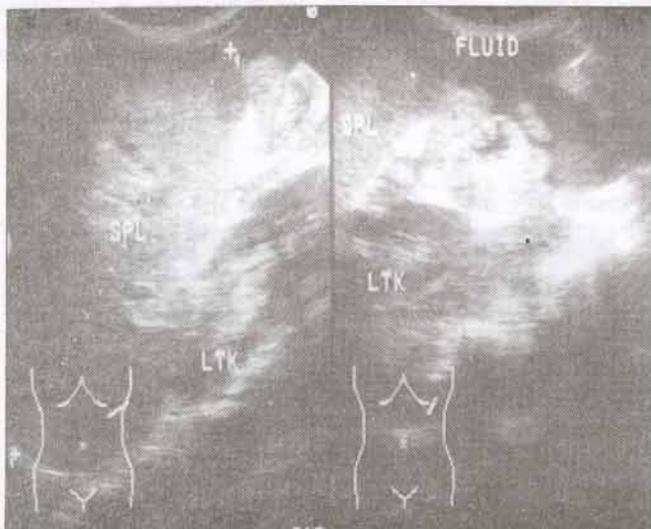


Figure II a: oblique scans through the spleen and left kidney.

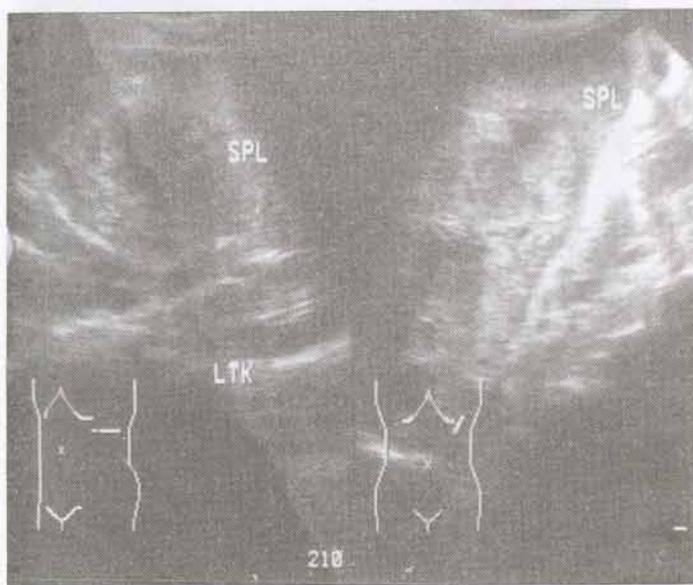


Figure II b: Oblique and transverse scans through the spleen.

The spleen was enlarged (173mm) and had ill-defined, multiple eco-poor areas within it (figure II a). There was fluid in the peritoneal cavity (figure II b). These features were in keeping with splenic rupture.

Splenectomy was performed the same day and haemoperitoneum found. The patient did well post operatively.

Case 3

A 39-year old male Rwandese presented with left hypochondrial pain for 4 months. This pain followed a fall from a tree. Tender splenomegaly was noted on physical examination. The ultrasound findings are shown in figures IIIa & b



Figure IIIa: Oblique scan of the spleen showing splenomegaly (165mm-pole to pole) and an irregularly margined hypoechoic area within the spleen.

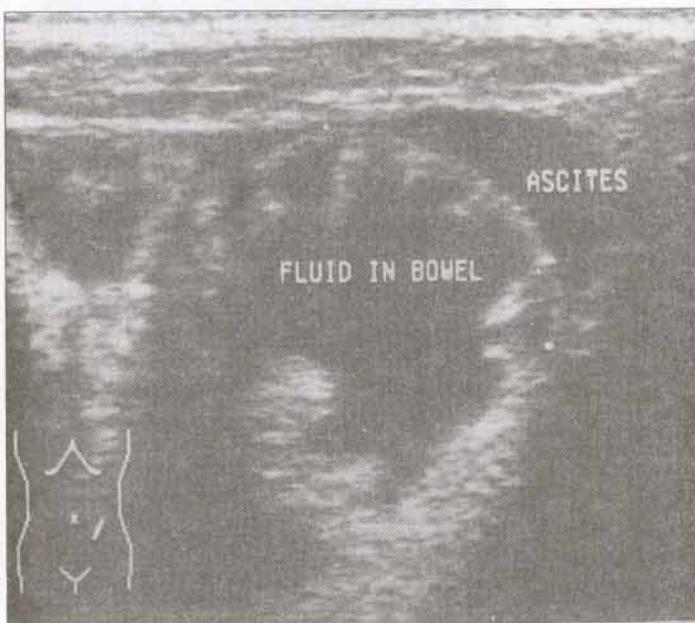


Figure III b: Fluid is seen in the peritoneal cavity, implying haemoperitoneum (i.e splenic rupture)

Splenic rupture leading to haemoperitoneum was confirmed at laparotomy and splenectomy performed with good outcome.

DISCUSSION

The spleen is the most commonly injured abdominal organ and this may follow accidental or non-accidental trauma. Four types of splenic injuries are recognised namely:

intraparenchymal laceration, subcapsular haematoma, and splenic rupture and delayed rupture¹. In all the three patients, the cause was accidental trauma. The first patient had intraparenchymal laceration while the other two had splenic rupture as evidenced by haemoperitoneum. The first sustained an extensive intraparenchymal laceration which led to an intraparenchymal haematoma whose volume was approximately 54cm³.

Signs of splenic trauma include splenic enlargement, a sonolucent rim of subcapsular haematoma, heterogeneity of splenic echotexture caused by a parenchymal haematoma, linear or stellate lucencies representing tears or lacerations and free peritoneal fluid indicating haemoperitoneum¹.

Splenic enlargement often occurs in blunt abdominal trauma. This enlargement is not necessarily an indicator of clinical deterioration but most likely due to marked adrenergic stimulation and changing blood volume². In these patients, splenic enlargement could have been due to a combination of this mechanism and the intraparenchymal haematomas.

Perisplenic fluid noted above the spleen following trauma should be regarded as a sign of splenic trauma. This can be helpful when splenic injury is not clinically obvious and an ultrasound scan is obtained as a screening examination. The left lobe of the liver, in some individuals, extends between the spleen and the left hemidiaphragm and when echo-poor, can resemble a perisplenic (subcapsular) haematoma².

An acute haematoma may be hyperechoic to the spleen then later become echopoor. A splenic laceration may be missed by ultrasound because haematomas may have the same echogenicity as the spleen². In these three patients, the splenic haematomas were echopoor.

Traumatic disruption of the spleen may result in seeding of splenic tissue (splenosis). This unusual complication usually appears as an incidental finding long after surgery².

Ultrasound tends to under estimate splenic injuries. Some authorities indicate that false-negative scan results may be as high as 50%. In spite of this disadvantage, ultrasound is cheap, free of radiation risks and more readily available compared to computed tomography and magnetic resonance imaging (MRI) modality that can be used to assess splenic injury.

The decision to operate these patients was arrived at with the help of the ultrasound findings which influenced management in all the patients. The high sensitivity of ultrasound to free peritoneal fluid makes it very important in detecting haemoperitoneum². Ultrasound did this ably in 2 of the 3 patients leading to proper categorisation of these cases as splenic rupture. Computed tomography is the initial choice in patients who sustain significant abdominal trauma and like MRI is highly accurate^{1,2,3,4}. The disadvantage of computed

tomography and MRI is high cost and the fact that they are not readily available in our environment.

Scintigraphy has also proved very accurate in identification of splenic injuries, with 90-98% sensitivity¹. Plain radiography may show features associated with splenic trauma such as left pleural effusion and associated left lower rib fractures⁵.

In conclusion ultrasound is invaluable in evaluation of suspected splenic injury. All patients who sustain abdominal trauma should undergo an ultrasound examination in order to detect possible splenic injury early.

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