

Anterior Renal Fascia Thickening: An Ultrasound Indicator For The Side of Tubal Rupture in Ectopic Pregnancy

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The width of anterior extra renal tissue is known to be increased on U S examination in patients with abdominal inflammatory disease such as acute cholecystitis, acute pancreatitis, acute appendicitis, perforated duodenal ulcer, liver abscess, leaking anastomosis. We have observed thickening of anterior renal fascia ,especially of the lower poles more on the side of ruptured tubal pregnancy. Normal values were obtained in 200 females with otherwise normal intrauterine pregnancy and mean values were between 1- 4mm (mean 1.7mm). The patients with ruptured tubal ectopic (proven post operatively), had values ranging from 7-12mm (mean 9mm) on the side of involved tube and 5-7mm (mean 6 mm) on the contralateral side. A normal measurement, however , does not preclude possibility of ectopic pregnancy.

Key words: Renal fascia thickening, ectopic pregnancy, tubal rupture

Widening of the anterior extra-renal tissue and increased echogenicity on ultrasound is a helpful sign in patients with abdominal pain and may point to the inflammation of near by structures such as the pancreas⁷, duodenum, ascending colon and appendix¹. The increased thickening and echogenicity of anterior pararenal space is likened to a thickened ring around the kidney and hence the term renal "rind sign". So far we know this sign has not been described in ruptured tubal ectopic pregnancy. In cases of fertile females with gestational amenorrhoea and lower abdominal pain, in presence of this sign ,a careful search should be made for presence of ectopic pregnancy on the side of increased extra renal tissue or its increased echogenicity.

Patients & Methods:

Unlike C T, the perirenal fascia cannot be identified as a distinct on ultrasound. The fascia merges with the fat and adjacent renal capsule, so that the measured space includes the anterior perirenal space as well as the anterior pararenal space, this is called anterior extrarenal tissue.

One hundred pregnant patients with an age range of 16-35 years (mean 24 years) with gestational amenorrhoea of 6-16 weeks were examined to determine the normal width of the anterior extra-renal tissue. These patients were referred to US for a variety of indication e.g. confirmation of pregnancy painless bleeding P/V, fetal well being but in whom there was no significant detectable abdominal disease. Fifty patients with an age range of 16-35 years (mean 22 years) with gestational amenorrhoea of 6-14 weeks with severe lower abdominal pain, diagnosed as ruptured tubal ectopic on US, were examined to determine the width of anterior extra renal tissue, using free peritoneal fluid as acoustic window. Measurement were taken on deep inspiration with patient lying in supine, anterior extra renal tissue was then measured, 2-3cm away from the inferior renal pole.

Results:

The normal values were determined. In pregnant women with normal intrauterine pregnancy the range was 1-4mm (mean 1.7mm). In 54% of patients the anterior extra renal tissue was a thin echogenic line of 1 mm. The value tended to be increased with obesity. No difference was found between measurements at right and left lower poles. In patients with ruptured tubal ectopic, had values ranging from 7-12 mm (mean 9 mm) on the side of involved tube and 5-7 mm (mean 6 mm) on the contralateral side (Fig 1).



Fig1: Renal Fascia thickening in case of ruptured ectopic pregnancy. All of these patients underwent laprotomy and peritoneal toilet, during which samples of extra-renal tissue were

obtained, showed microscopic evidence of inflammation with engorged blood vessels and focal collections of polymorphs.

Discussion:

The retroperitoneum is divided into three compartments by the anterior and posterior renal fascia (Gerota's Fascia) and the latero-conal fascia.

The three compartments are the 1-perirenal space 2-anterior pararenal space and 3 posterior pararenal space (Fig 2)

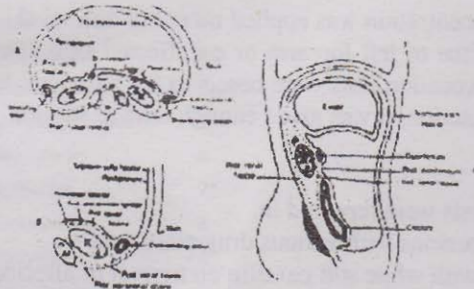


Fig2: Schematic representation of retroperitoneum.

The kidneys are surrounded by the perirenal space which contains fat and fibrous tissue. The perirenal space is the shape of inverted cone (Open at bottom and closed at top) The perirenal space is bounded by the anterior and posterior renal fascia, which is connected to renal capsule by fibrous trabeculae. The fascia is made up of dense connective tissue which blends with connective tissues investing the aorta, inferior venacava and roots of the superior mesenteric vessels⁵. Lateral to the kidneys, the anterior and posterior pararenal fascia fuse and form a single latero-conal fascia. Superiorly, the fascia fuses above the adrenal glands and become attached to the diaphragms. Inferiorly, the fascia extends into the pelvis where there is only a single posterior pararenal space. (No anterior pararenal space). The anterior pararenal space is bounded anteriorly by the posterior parietal peritoneum, posteriorly by the anterior perirenal fascia and laterally by the latero-conal fascia. It is continuous across the mid-line. Presently the anterior pararenal space is also called the intermesenteric space which is separated into two compartments, one for the colon (colonic intermesenteric space) and one for the pancreas

and the duodenum (pancreatico-duodenal intermesenteric space). The posteriorly para renal space is bordered anteriorly by the posterior renal fascia and posteriorly by the fascia over the psoas muscle which is continuous with transversalis fascia.

The anterior pararenal space is in close anatomical relationship with the pancreas, duodenal loops, ascending colon, caecum, retro caecum appendix and descending colon that is why it is a common site of infection and fluid collection². Involvement of the anterior pararenal space is usually confined to the side of origin of the inflammatory process which may originate from colon, appendix, pancreas, gall bladder or duodenum³. The renal 'rind sign' is due to extension of inflammation into the pararenal space. This was confirmed in our patients in whom a sample of extra-renal fat showed histological evidence of inflammation.

Widening and alteration in echogenicity of the pararenal space may also be seen with renal infections. Infections which do not break the renal cortex do not lead to any increase in width of anterior extra renal tissue. However an inflammatory process involving the tissue surrounding the renal capsule such as the perinephric abscess would alter the echogenicity and width of the pararenal space⁴. Widening of anterior extra renal space has also been noted in non inflammatory disease such as Cushing syndrome, trauma to flank, perirenal hematoma, leaking aortic aneurysm or retroperitoneal fibrosis.

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