INJURIES OF THE KIDNEY

ESSAY

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Master Degree of General Surgery

BY

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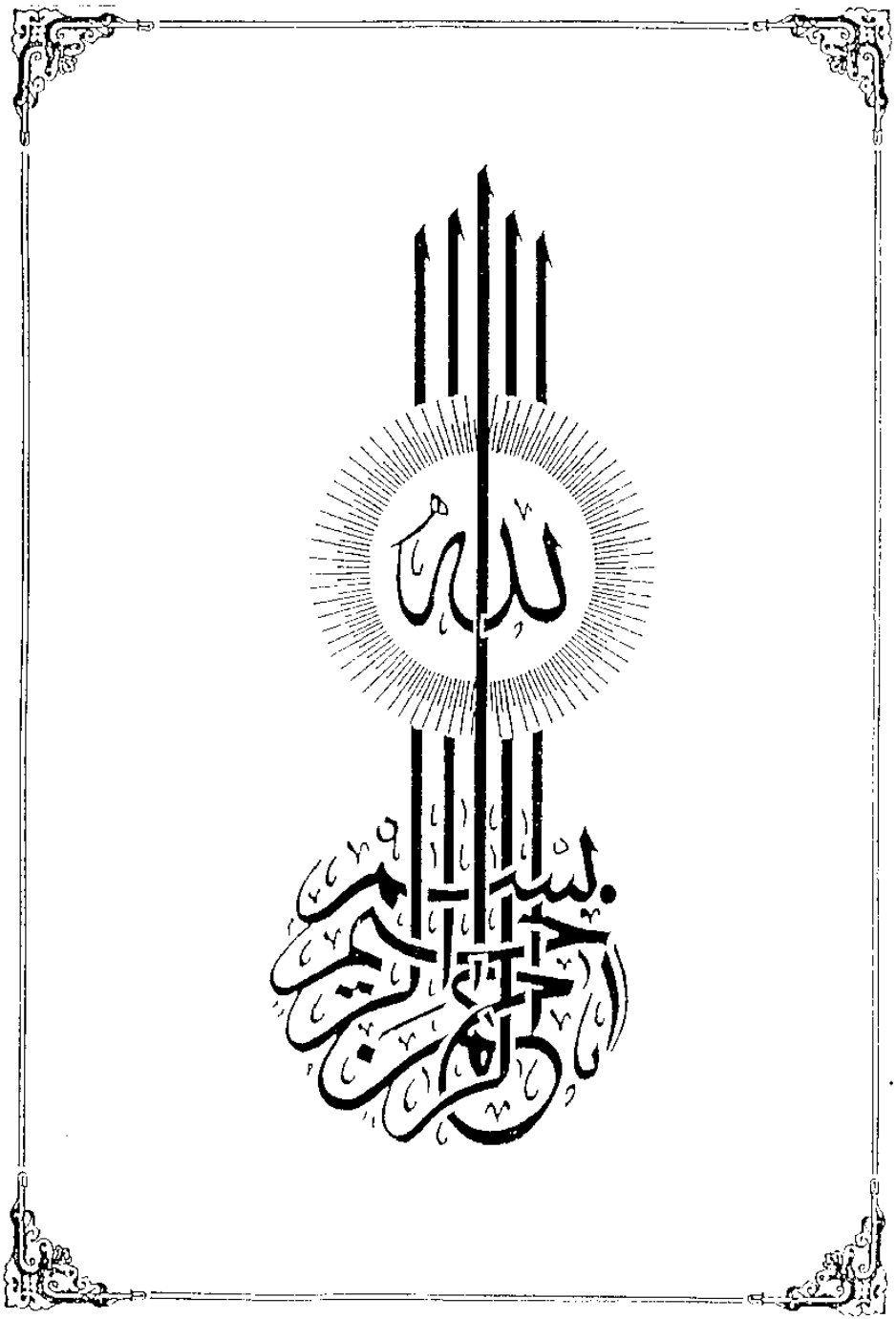

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INTRODUCTION

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The incidence of the renal injuries is increasing. This would be expected as the accident rate increases. Accidents are now the most common cause of death in the first four decadesof life.

Renal injuries are the most common injuries of the urinary system.

Most injuries occure from automobil accidents or sporting, shiefly in men and boys.

Kidney with exiting pathological conditions such as hydronephrosis or malignant tumours are most readily ruptured from mild trauma.

The key to successful management of patients with renal trauma is an accurate assessment of the extent of injury and a thorough knowledge of the indications for renal exploration.

The diagnosis of renal trauma for many years was achieved through history, clinical findings, the performance of a survey film of the abdomen,

urinalysis, excretory urography, cortography and selective renal artery angiography.

The development of the scintillation camera and the availability of 99 mtc, and computed tomography, approximately fifteen years ago has widened this diagnostic horizone, and allows proper staging of the renal injuries and a systemic approach to these problems.

Earlier studies indicate a higher incidence of late complications than will be observed with present management.

ANATOMY

ANATOMY OF THE KIDNEY

The long axis of the kidney is parallel to, but not coincident with, the long axis of the 12 th. rib.

Both kidneys normally lie entirely above the level of the umbilicus, the lower poles being about 2.5 cm. above the highest point of the iliac crest. The right kidney reaches the upper border of the 12 th. rib, the left reaches the lower border of the 11 th. rib.

The outer border of the organ lies half an inch lateral to the outer border of the sacrospinalis muscle.

The pelvis of the kidney is seen in pyelograms to lie opposite to the 1 st. and 2 nd. lumber transverse processes. (Plessis, 1975).

Each kidney is about 11 cm. in length, 6 cm. in breadth and about 3 cm. in anteroposterior thickness, in the adult male the weight of the kidney average about 150 gm., in the adult female 135 gm., in thin individual with a lax abdominal wall the lower pole of the kidney may just be felt in full inspiration by bimanual examination of the loin. Usually, however, it is impalpable.

In the recumbent position, the outline of each kidney can be projected to the anterior or posterior surface of

the abdominal wall as follows, bearing in mind that the right kidney is a littler (about 1.25 cm.) lawer than the left.

a. Anterior surface:-

The centre of the hilus is approxmately on the transpyloric plane, about 5 cm. from the mediam plane and slightly medial to the tip of the ninth costal cartilage. The hilus of the left kidney is just above the transpyloric plane and that of the right kidney just below it, in relation to this position of the hilus, a kidney-shaped figure is drawn, 11 cm long and 4.5 cm. broad, so that the upper pole is about 2.5 cm. and the lower pole about 7.5 cm. from the midline.

b. Posterior surface:

The centre of the hilus lies opposite the lower border of the spine of the first lumber vertebra, about 5 cm. from the median plane. In relation to this point, a figure is constructed in the same way as that described for the anterior surface. The lower pole is usually a little (2.5 cm) above the highest part of the iliac crest.

The kidneys lie about 2.5 cm. lower is standing than in the recumbent position and they move up and down with respiration. (Williams and Warwick, 1973).

Fig. (1) :

Susface projection of the duodenum and kidneys, the lawer ribs and the lumber vertebrae are also indicated.
(Gray's Anatory), 1973.
after willims and Warwick page 1316

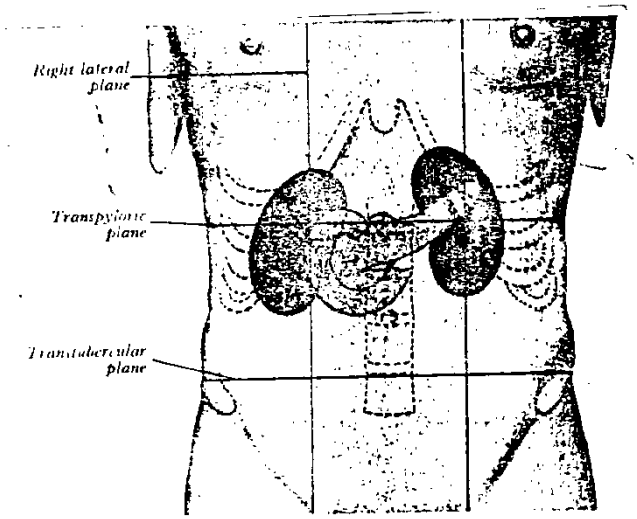

Fig 8-145

Renal Relations:

The Anterior surface is convex,and actually faces anterolaterally, its relation to adjacent viscera differ on the two sides of the body.

a. Anterior surface of right kidney:

A small area of the superior pole is in contact with the right suprarenal gland, which may overlap it or the upper part of the medial border. A large area just below this and involving about three - fourths of the surface, lies in the renal impression on the right lobe of the liver, and a narrow area near the medial border is in contact with the descending part of the duodenum. Inferiorly the anterior surface is in contact laterally with the right colic flexure,and medially with part of the small intestine. The area in relation with the small intestine and almost the whole of the area in contact with the liver are covered with peritoneum (with the intervention of the renal fascia); the suprarenal, duodenal and

colic area are devaid of peritoneum. (Williams and Warwick, 1973).

b. Anterior surface of the left kidney:

A small area along the superior pole of the medial border is in relation with the left suprarenal gland, and about the upper two-thirds of the lateral half of the anterior surface are in contact with the renal impression on the spleen.A somewhat quadrilateral field, about the middle of the anterior surface, is in contact with the body of the pancreas and the splenic vessels. Above this there is a small triangular region, between the suprarenal and splenic areas, which is in contact with the stomach. The size of the gastric area of contact is very variable. Below the pancreatic and splenic areas the lateral part is in relation with the left colic

Fig. (2):

The antiar surface of the kidneys, showing the areas related to neighbouring viscera. (Gray's Anatony 1973). after Williams and Warwick page 1313

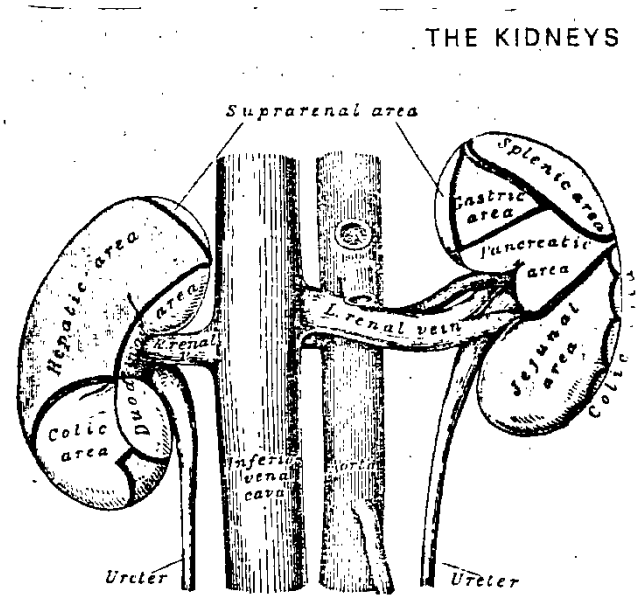

Fig 8 - 146

flexure and the commencement of the descending colon, and the medial part with the first coils of the jejunum, the jejunal area is extensive but the colic area forms an irregular, narrow strip immediately adjaining the lateral barder of the kidney. The area adjacent to the stomach is covered with the peritoneum of the omental bursa, while the area in relation to the spleen and jejunum are covered with the peritoneum of the greater sac; behind the peritoneum of the jejunal area some branches of the left colic vessels are related to the kidney, the suprarenal, pancreatic and colic areas are devoid of peritoneum (Williams and Warwick, 1973).

The posterior surface: The posterior surface Of each kidney is directed posteromedially. It is embedded in fat, and is devoid of peritoneal covering. It lies upon the diaphragm, the medial and lateral lumbocostal arches, the psoas major, the quadratus lumborum, and aponeurotic tendon of the transversus abdominis, the subcostal vessels, and the last thoracic iliohypogastric and ilio-inguinal nerves. Right kidney rests upon the twelfth rib, the left on the eleventh and twelfth. The diaphragm separates the kidney from the pleura, which descends to form the costodiaphragmatic recess.

RENAL RELATIONS

Fig. (3):

The posterior surface of the kidneys, showing the areas of relation to the posterior abdominal wall. (Gray's anatomy, 1973)pag 1317

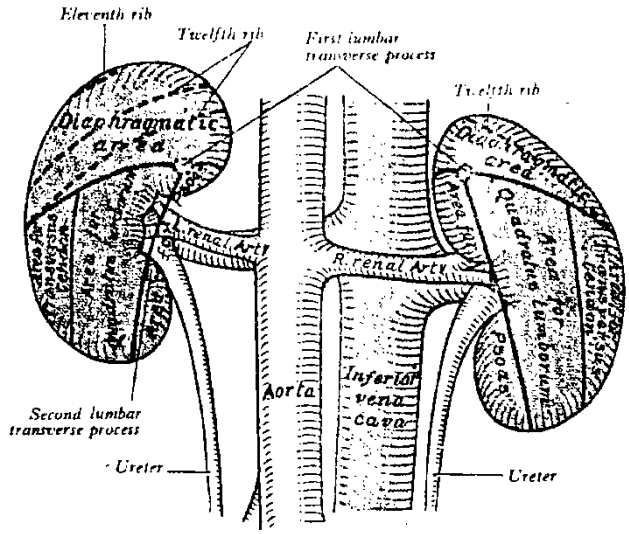

Fig. 8-147

The superior pole of each kidney is thick and round and is nearer the median plane than the lower; it is related to the suprarenal gland. The inferior pole, smaller and thinner than the upper, extends to within 2.5 cm. of the iliac crest.

The lateral border is convex; that of the left kidney covered superioly with greater sac peritoneum which separates it from the spleen and, below this, it is in contact with the dessending colon; the lateral border of the right kidney is separated by peritoneum of the greater sac from the right lobe of the liver.

The medial border of each kidney is convex adjacent to the poles and concave between these curvatures; it slopes downwards and laterally, in its central part there