HYDRONEPHROSIS

A THESIS

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the Master Degree (M.Sc.)

GENERAL SURGERY

By

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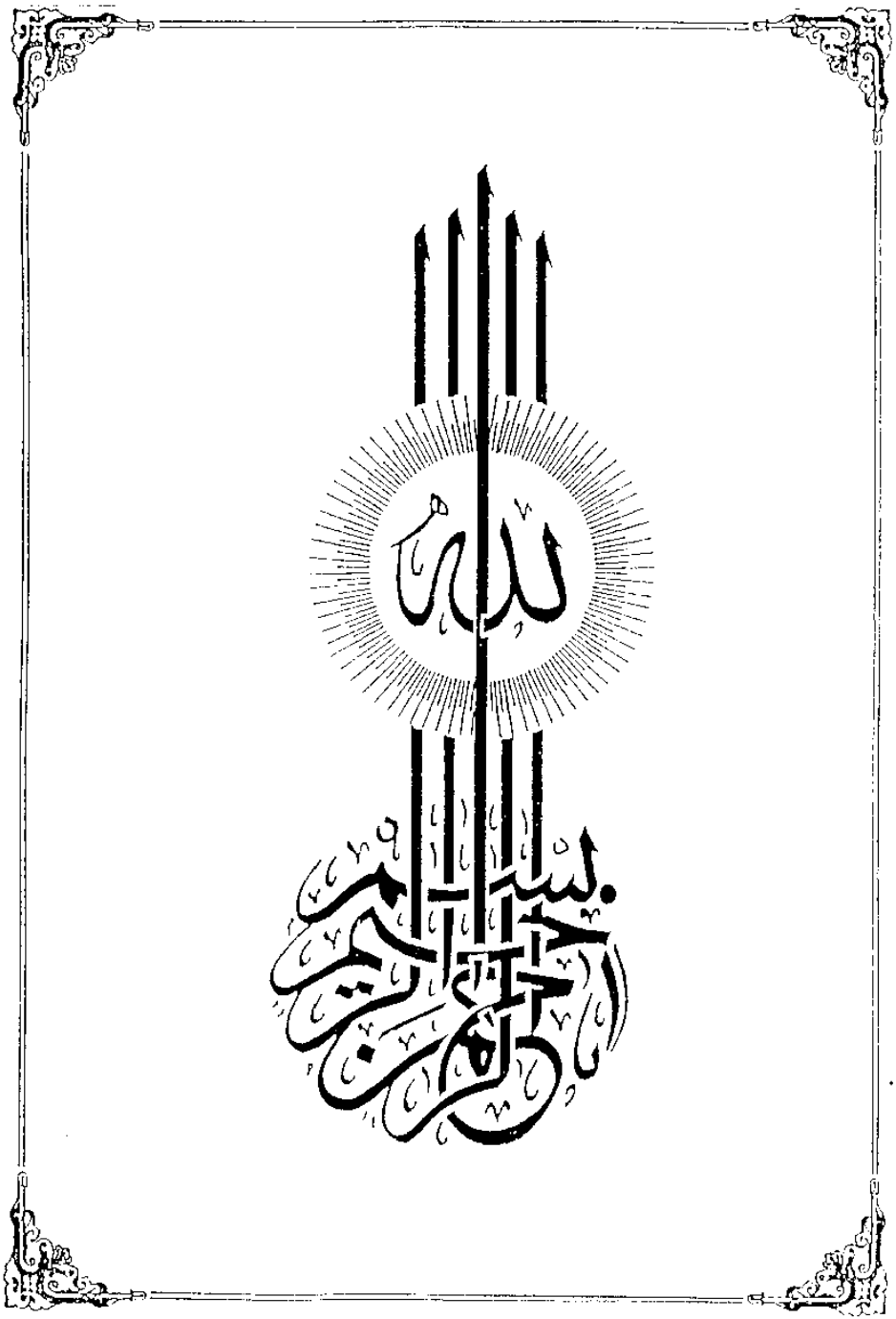

C O N T E N T S

INTRODUCTION

I N T R O D U C T I O N

Hydronephrosis is one of the complications of urinary tract obstruction. It has become evident in recent years that urinary tract obstruction occurs with considerable frequency. It also has been established that the stigmata of obstruction may vary from abrupt and complete impairment of renal function to slow, progressive destruction of the renal parenchyma evolving over many years.

Three terms are currently used to designate the consequences of urinary tract obstruction. These are: obstructive uropathy, hydronephrosis, and obstructive nephropathy. Although these expressions are frequently used interchangeably, each has its specific connotations, and it is considered important to distinguish between them.

Obstructive uropathy: is a general expression used to describe the structural changes that occur at any point in the urinary tract proximal to the site of the lesion. This term tends to focus on the anatomic changes in the urinary tract without specific regard for the structure or function of the involved kidney. Obstructive uropathy therefore may exist in the absence of renal disease, or it may be associated with advancing

nephropathy. Under any condition, however, it must be regarded as a potential precursor of intrinsic renal disease.

Hydronephrosis: is defined as dilatation of the renal pelvis and calyces. Thus the presence of pelvic dilatation provides presumptive evidence of urinary tract obstruction, and the degree of dilatation may be an important clue in the overall assessment of the consequences and natural history of an obstructing lesion. It should be noted that the term hydronephrosis is frequently used to characterize the composite effects of urinary tract obstruction not only on the renal pelvis but on the kidney. It must be stressed, however, that a given degree of hydronephrosis may produce highly variable changes in renal function, hence the magnitude of pelvic dilatation can at best provide only indirect and limited information about the functional capacity of the involved kidney. A marked dilatation in external pelvis may occur without significant functional or structural changes in the kidney, whereas a mild degree of dilatation in an intrarenal pelvis may be associated with severe nephron destruction.

Obstructive nephropathy: will be used to describe the renal lesion which occurs as a consequence of urinary tract obstruction. Hence this expression, in contrast to the other two terms, attaches primary to the anatomic and functional integrity of the kidney.

AIM OF THE WORK

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This work was done to discuss the aetiology, pathology, diagnosis and treatment of hydronephrosis. It was done also to study thirty cases of hydronephrosis as regard the age and sex incidence, the clinical presentation, the aetiology of urinary obstruction and management.

REVIEW OF LITERATURE

Anatomy of the Kidney

There is remarkable degree of conformity between the two kidneys of any individual, including the renal outline, shape, weight and vascularization. The weight and size of the kidney is dependant upon the general stature of individual, age and sex. The right kidney is smaller than the left and the kidneys of women are smaller than those of men. The average kidney measures 11.5 cm in length, 6 cm in width and 3.5 cm in thickness. Its weight varies from 140 to 170 gm and constitutes approximately 0.4 percent of body weight in adult (Lich, 1978).

Renal surface projections:

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 right kidney is littler lower (about 1.25 cm) than the left.

a- Anterior surface:

The centre of the hilus is approximately on the transpyloric plane, about 5 cm from the median plane and slightly medial to the tip of ninth costal cartillage. The hilus of the left kidney is just above the trans-pyloric 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 midline. (As the kidney lies obliquely, the width of the figure is about 1.5 cm less than the actual width of the organ).

b- Posterior surface:

The centre of the hilus lies opposite the lower border of the spine of the first lumbar vertebra, about 5 cm from the median plane. In relation to this, a figure is constructed in the same way as that described above for the anterior surface. The lower pole is usually a little (2.5 cm) above the highest part of the iliac crest. The kidneys lies about 2.5 cm lower in the standing than in the recumbent position (Warwick, 1973).

Renal Covering:

1. Fibrous capsule:

The true renal capsule is a fibrous structure that is closely applied to the surface of the kidney because of the penetrating nephrocapsular capillaries and lymphatics, but it is not adherent.

2. Fatty capsule:

Perinephric fat, located mainly laterally and posteriorly, develop after birth and attain full differentiation during puberty.

3. Renal fascia of Gerota:

Two layers enclosing the kidney, suprarenal gland, vessels and nerves and the fatty capsule, open below, cranially into the diaphragmatic fascia, laterally close, abuts the transversalis fascia, medially the two layers fuse and join adventitia of aorta and V. cava. The renal fascia of Genota is consists of an anterior "Toldt" and a posterior "Zukerkandle" layer formed by condensation of the retroperitoneal tissue. Outside Gerota's a less marked layer of fat, the para nephric fat is present (Roben, 1973).

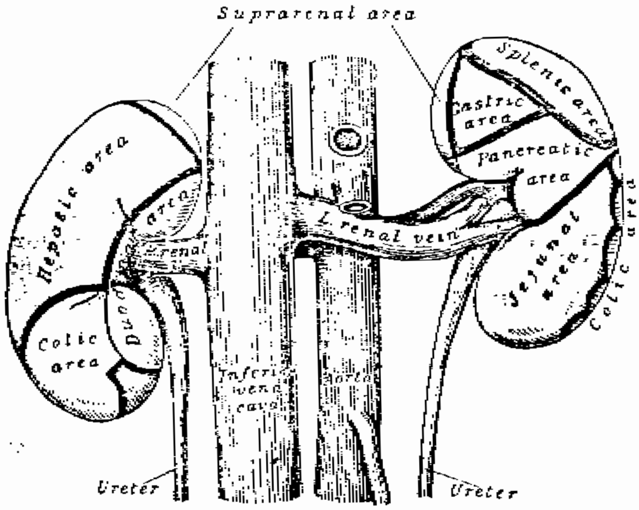
Renal Relations:

The anterior surface:

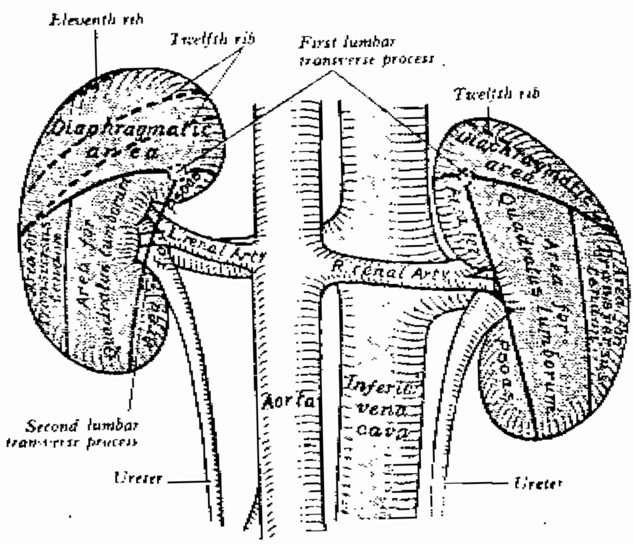
Is convex, and actually faces anterolaterally. Its relations to adjacent viscera differ on the two sides of the body.

a- Anterior surface of right kidney:

The upper two thirds are related to the posterior surface of the right lobe of the liver, the peritoneum covering the liver being reflected on the kidney, so that these two organs are separated by a pouch of peritoneum. As the line of reflection of the peritoneum is below the level of suprarenal gland, this gland and upper pole of the kidney are in direct contact with the liver, the so called "bare area" of the liver. Inferiorly,



The anterior surfaces of the kidneys, showing the areas related to neighbouring viscera.



The posterior surfaces of the kidneys, showing the areas of relation to the posterior abdominal wall. (After Warwick, 1973).

below the hepatic area, the anterior surface is related directly without peritoneal intervening, to the right colic flexure laterally and to the second part of the duodenum medially. The small intestine is related to the lower medial aspect of the anterior renal surface, but is separated from the kidney by the peritoneum (Moore, 1980).

b- Anterior surface of 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 is in contact with renal impression on the spleen.
- A somewhat quadrilateral field, about the middle of the anterior surface, is in contact with the body of the panceas 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. Below the pancreatic and splenic areas the lateral part is in relation with left colic flexure and the commencement of the descending colon and the medial part with first coils of the jejumum.
- The areas adjacent to the stomach is covered with the peritoneum of the omental bursa, while the areas in relation to the spleen and jejunum are covered