ENDOSCOPIC MANIPULATIONS OF ORGANIC URETERIC DISEASES

Thesis

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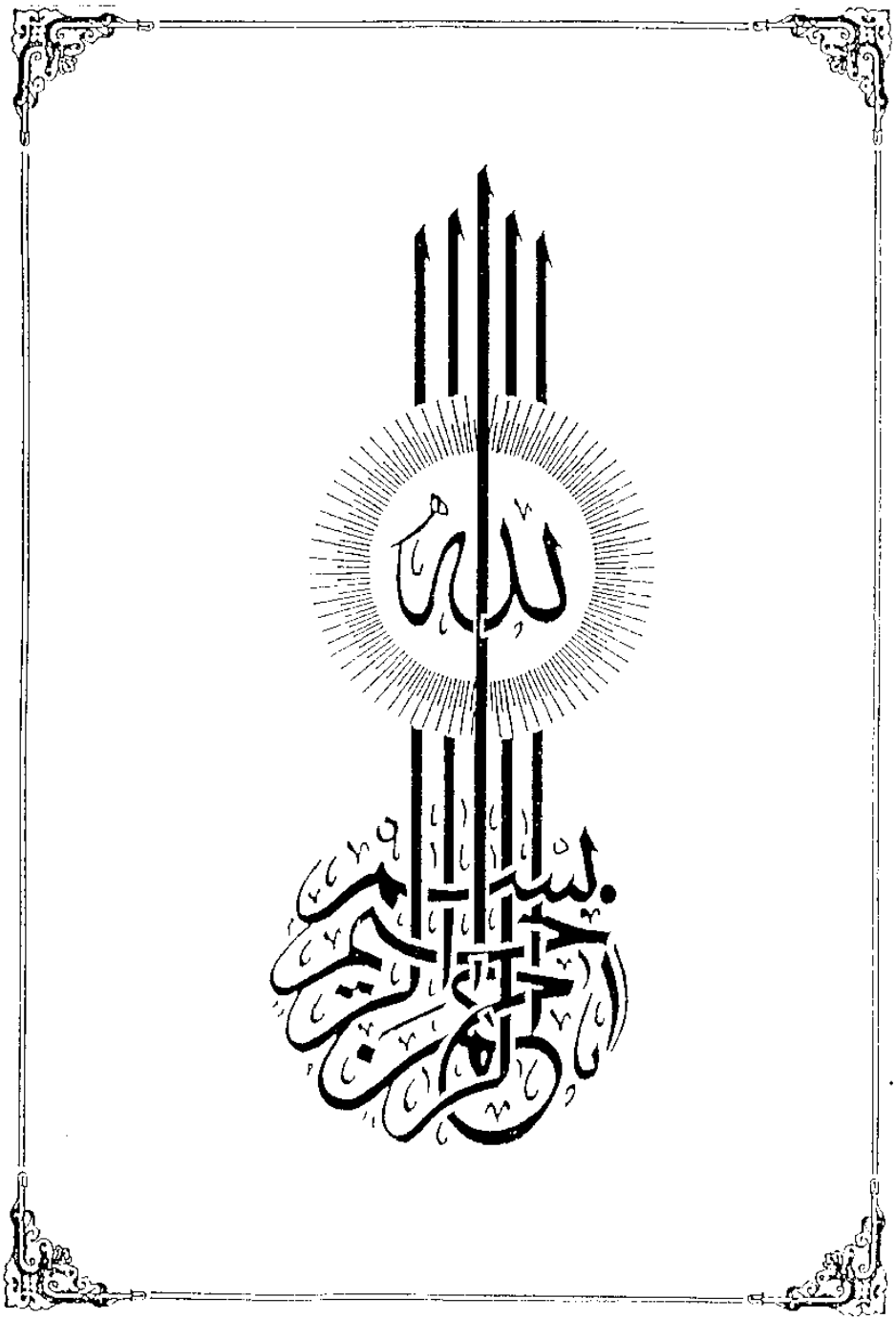
بسم الله الرحمن الرحيم

وما اوتيتم من العلم إلا قليلا

سورة الإسراء (آية ٨٥)



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CONTENTS

INTRODUCTION

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In the last few years there has been a revalutionary change in the technology of endourology since its development, the ureteral endoscopy became an attractive alternative to open surgery in treating many of the ureteric lesions. Ureteroscopy is not merely for stone disease, but also for diagnosis and therapy of filling defects, strictures, foreign body extraction, and ureteral and renal pelvic tumors.

In our work, we tried to assess the proper indications, techniques, results and complications of this recent endoscopic modality in the management of various ureteral lesions.

REVIEW OF LITERATURE

ANATOMY

The ureter is a musclar tube extending from the renal pelvis through the retroperitonium so that its peristaltic contractions can deliver urine from the kidney to the urinary bladder.

The average ureter is about 30 cm in length and may be divided into approximately equal abdominal and pelvic portions. Each portion, in return, may be further classified, somewhat artificially, into two divisions. The abdominal ureter consists of lumbar and iliac divisions, each approximately 8 cm in length traversing the lumbar and iliac fossae respectively. The pelvic ureter is divided into the longer parietal and shorter intravesical divisions. The abdominal ureter assumes a vertical course downwards and medially on the anterior surface of the psoas which separates it from the transverse processes. The abdominal ureter is well encompassed within an extension of Gerota's fascial space. The iliac abdominal and entire pelvic portions of the ureter usually remain closely attached to the peritonium when it is reflected anteriorly, rather than remaining adherent to the fascial structures overlying the posterior abdominal and pelvic musculature.

The pelvic ureter is approximately 15 cm in length. The longer parietal division of the pelvic ureter continues in its close relationship with the peritoneum, crossing the pelvic brim just lateral to the bifurcation of the common iliac arteries. It descends posterolaterally between the hypogastric artery and the peritoneum and is separated by the hypogastric artery from the pelvic musculature and nerves. As it approaches the bladder base, the superior vesical artery crosses above the ureter, which then becomes medially directed once again approximately at the level of the ischial spine to reach the urinary bladder. ***(Cohen, J.D. and Persky, L.; 1983)***

Microscopic Anatomy:

The ureter is composed of three layers easily detected on cross sectional views :- fibrous, muscular and mucosal. The fibrous layer is continuous with the renal capsule within the renal sinus and continues to merge imperceptibly with the tissues surrounding the urinary bladder. The muscular layer is composed of circular and longitudinally arranged fibres varying in location and predominance depending upon the level. Circular fibres are predominant around the bases of the renal papillae, Longitudinal fibres then become intermingled with

circular fibres along the course of renal pelvis and ureter, longitudinal fibres are predominant in its intravesical portion.

The inner mucosal layer is composed of transitional epithelium continues with that of the urinary bladder. This mucosa is characterized by variously developed longitudinal folds that become unfolded during ureteral dilatation.

The ureter is not of uniform caliber but rather displays three points of physiologic narrowing at :

1- The uretero-pelvic junction.

2- The crossing of the iliac artery.

3- The ureterovesical junction. Fig. (1).

The internal diameter of the ureter tends to be smallest at the ureterovesical junction. These three narrow points correlate well with the areas of impaction of ureteral calculi.

The fact that the intramural ureter is the narrowest region is important for ureteroscopic manipulations. If this narrow area can be dilated so as to admit the available instruments, the rest of the ureteral path can usually be negotiated without difficulty. ***(Campbell's Urology, 1986)***

Ureteral Blood Supply:

The arteries supplying the ureter arise from renal, abdominal aortic, gonadal, hypogastric, vesical and uterine arterial branches Fig. (2). Branches from the main renal artery or renosuprarenal plexus serve as a rich contribution to proximal ureteral blood supply. Similarly, the numerous branches to the pelvic ureter from hypogastric, vesical, and uterine arterial sources result in a heavily vascularized region. The intermediate, or iliac abdominal region of the ureter receives the fewest direct arterial branches. However, there is a richly intercommunicating anastomotic network of smaller vessels surrounding the ureter throughout its length that ensures its nutrition and viability. Venous drainage of the ureter is multiform and tends to follow a pattern similar to that seen in arterial distribution.

(Campbell's Urology, 1986)

Endoscopic Ureteral Anatomy:

Both ureteroscpic and radiologic studies have revealed three sites at which the ureter is usually constricted: the ureteropelvic junction, the pelvic brim and the ureterovesical junction. Rigid ureteroscopy necessiates mechanical dilatation of the narrowest of these sites, the ureterovesical junction.

Endoscopically, these areas are nondistensible relative to the remainder of the ureter and appear somewhat narrowed.

Additional ureteroscopic landmarks have been identified elsewhere. For example, pulsations can be observed at the site where the ureter crosses the common iliac vessels. The proximal ureter is easily visible endoscopically as the variations of the kidney position with breathing cause movement of this area secondary to its fixed, nonmobile nature compared with mobile renal pelvis. Additionally a bend of mucosa can be seen in the region of the ureteropelvic junction. Prior ureteral manipulation or surgery can be the underlying reason for difficult dilatation or ureteroscopy. Fibrosis at the ureterovesical junction may be the result of previous ureteral reimplantation, stone basketing, radical pelvic surgery or external beam radiation. Additionally, a large intravesical prostate can pose some limitation to ureteroscopy.

(Motola, J.A.; Shahon, R.S. and Smith, A.D.; 1988)

Anatomy of the ureterovesical junction:

The ureter penetrates the bladder wall at the ureteral hiatus to form the intravesical ureter where it is divided into an intramural segment totally surrounded by the bladder

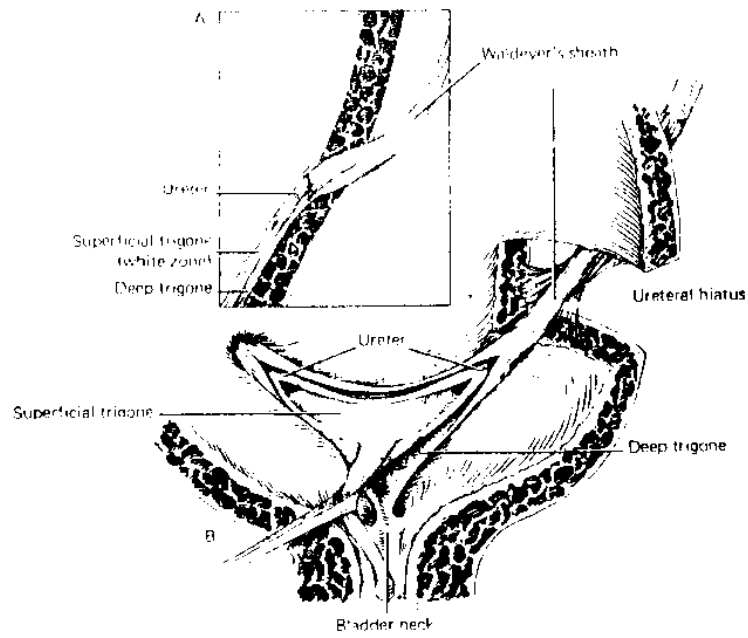

Fig (3) Showing the normal anatomy of the ureterovesical junction. Quoted from Campbell's Urology.