Retroperitoneal versus Transperitoneal Laparoscopic approach for Management of Upper Ureteric Stones

Thesis

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Mohamed Emad El-saied El-Fiky

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List of Abbreviations

Abb.	Full term
ACh	*Acetylcholine*
ASA	*American Society of Anaethesiologists*
AUA	*American Urological Association*
BMI	*Body mass index*
CT	*Computed Tomography*
EAU	*European Association of Urology*
ESWL	*Extracorporeal shok wave lithotripsy*
EXU	*Excretory urography*
IVP	*Intravenous pyelography*
IVU	*Intravenous urography*
KUB	*Kidney, ureter and bladder x-ray*
LRU	*Laparoscopic retroperitoneal ureterolithotomy*
LTU	*Laparoscopic transperitoneal ureterolithotomy*
MRU	*Magnetic resonance urography*
NANC	*Non adrenergic non cholinergic*
NO	*Nitric oxide*
OSS	*Open stone surgery*
PDE	*Phosphodiesterase*
PNL	*Percutaneous nephrolithotomy*
PS	*Physical status*
SPR	*Stone passage rate*
UTI	*Urinary tract infection*

ABSTRACT

The use of laparoscopy in the management of ureteral stones was one of the earliest applications of laparoscopy in urology, the first report being made by Wickham in 1979. In this study we present our experience with laparoscopic ureterolithotomy comparing both transperitoneal approach and retroperitoneal approach through a prospective randomized comparative study.

Through our study we concluded that Laparoscopic ureterolithotomy is technically feasible and safe and both of its two approaches either transperitoneal or retroperitoneal are successful procedures with a success rate nearly the same in both techniques, but and based on our results through this study, we recommend the retroperitoneal approach for laparoscpic extraction of the ureteral stones due to the fact that it has the least operative time than the transperitoneal approach, getting rid of the all stone burden, lower rate of complications and a better postoperative recovery.

Keywords: Laparoscopic transperitoneal ureterolithotomy - Kidney, ureter and bladder x-ray

INTRODUCTION

Current treatment options for ureteral stones include medical treatment, extracorporeal shock wave lithotripsy (ESWL), and various endoscopic procedures, with the standard open ureterolithotomy being less frequently practiced nowadays.

The use of laparoscopy in the management of ureteral stones is one of the earliest applications of laparoscopy in urology. Laparoscopic ureterolithotomy is either performed via a retroperitoneal approach ***(Zhou et al., 2014; Won et al., 2017)*** or a transperitoneal approach ***(Nasseh et al., 2013; Naghiyev et al., 2018).***

Wickham reported the first laparoscopic retroperitoneal ureterolithotomy in 1979 ***(Caliskan et al., 2017)***, while Raboy and his colleagues reported on the first laparoscopic transperitoneal ureterolithotomy in 1992 ***(Şahin et al., 2017)***.

AIM OF THE WORK

To compare the laparoscopic Retroperitoneal ureterolithotomy with the Laparoscopic Transperitoneal ureterolithotomy as a better alternative to conventional open surgery to extract a large, impacted and hard stones at the proximal two thirds of the ureter, regarding:

1- Intraoperative data:

a) Number of port.
b) Operation time.
c) Intraoperative Blood loss.

2- Post operative data:

a) Time to start oral feeding
b) Drainage catheter duration.
c) Urethral catheter duration.
d) Mean hospital stay.
e) Residual stones.

3- Complications among the studied groups:

a) Stone migration.
b) Major vessels injury.
c) Bleeding and need to Blood transfusion.

4- Prolonged drainage and need to DJ stenting.

To reach a final conclusion about the best approach of laparoscopic ureterolithotomy, either transperitoneal or retroperitoneal; regarding the safety and efficacy of both of them.

Chapter 1
ANATOMY AND PHYSIOLOGY

Anatomy

The ureters

Anatomic Relations:

Ureteral Course in the Abdomen

The ureter, measured from the ureteropelvic junction to the bladder, is 28 to 34 cm long. The left ureter is slightly longer than the right. It is enclosed in the intermediate stratum of the retroperitoneal fascia within the envelope of the renal fascia, which is intimately attached to the peritoneum. Evidence of this attachment is the adherence of the ureter to the peritoneum as it is mobilized medially at operation. Each ureter passes over the medial part of the psoas major in line with the ends of the transverse processes of the lumbar vertebrae. It goes over the genitofemoral nerve, and at its midpoint passes under the gonadal vessels into the pelvis near the bifurcation of the common iliac vessels. The ureter adheres to the mesocolon, so that injury to its abdominal portion during surgery on the sigmoid colon occurs, especially when the mesosigmoid is involved in an inflammatory disease. The proximity of the inferior mesenteric artery to the ureter presents another hazard ***(Gregory TM , 2012)***

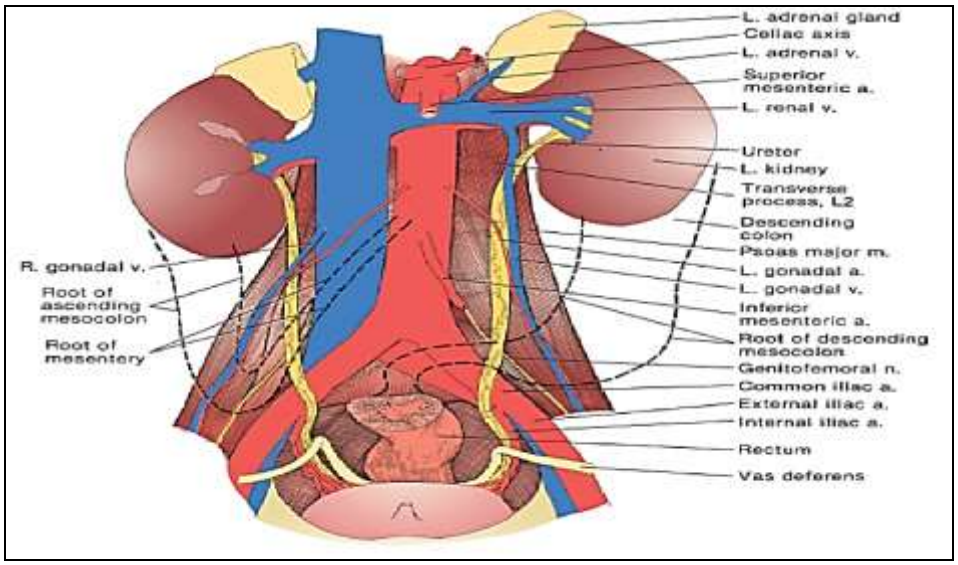

Fig. (1): Ureteral relations in the abdomen ***(Hinmans Atlas of Urosurgical Anatomy, 2012)***.

Pelvic Relations of the Ureter in the Male:

After crossing the common iliac artery in the pelvis, the ureter follows the course of the internal iliac artery and runs along the anterior border of the greater sciatic notch, and turns medially at the ischial spine to lie along the levator ani before reaching the bladder. The vas deferens crosses in front of it, and the ureter, in turn, passes in front of the tip of the seminal vesicle. For an endoscopic approach, the first portion of the ureter will be found to run posterolaterally, passing under the vas deferens. It then curves up over the obturator artery to the crossing of both internal and external iliac arteries or of the common iliac artery. The site of crossing is marked by a pulsatile indentation in the posteromedial aspect of the ureter. After passing over the common iliac vessels at the sacral

promontory, the ureter then bends posteriorly to take a more or less straight course under the spermatic vessels to the renal pelvis. On the left, the ureter runs under the left colic artery at the junction of its middle and upper third, whereas on the right, the right colic and ileocolic vessel are not a problem because they lie at a high level and more anteriorly ***(Gregory TM ,2012)***

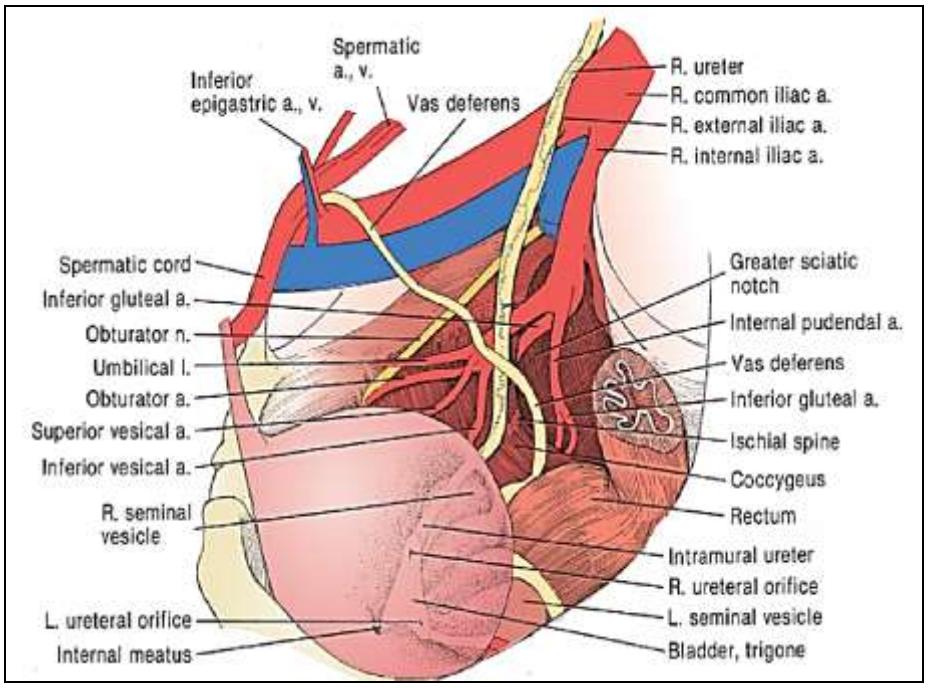

Fig. (2): Pelvic relations of the ureter in male ***(Hinmans Atlas of Urosurgical Anatomy, 2012)*.**