بسم الله الرحمن الرحيم

وَقُـل رَّبِّ زِدْنِـي عِلْمـًا

صدق الله العظيم

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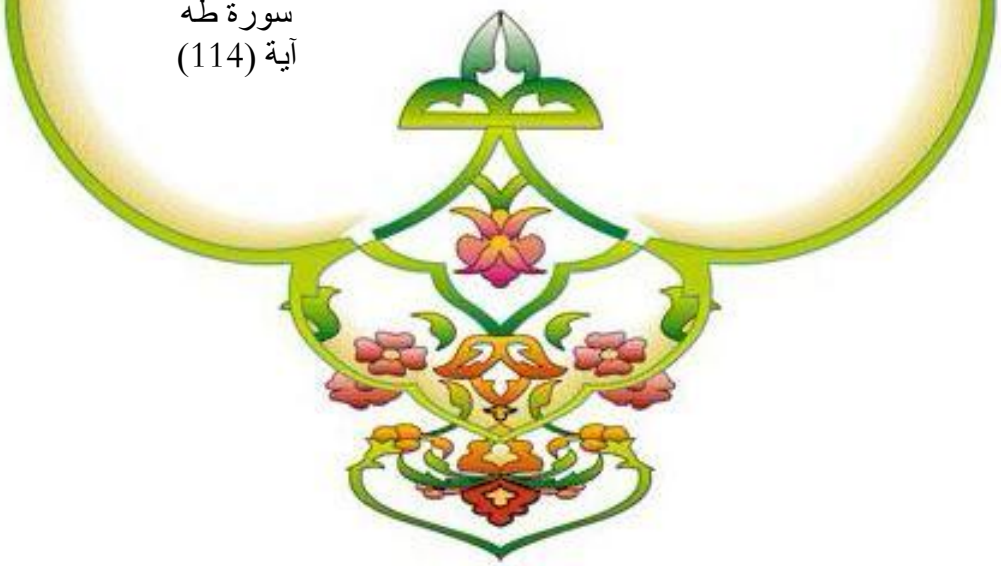

Tubeless Percutaneous Nephrolithotomy With and Without Fibrin Glue Sealant

Thesis
Submitted in partial fulfillment of
M.D Degree in Urology

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2013

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CIRF	Clinically insignificant residual fragment
CLD	Chronic liver disease
Cm	Centimeter
CT	Computed tomography
DM	Diabetic mellitus
ESWL	Extracorporeal shock wave lithotripsy
FG	Fibrin glue
Fig	Figure
Fr	French
g	Gram
h	Hour
Hb	Hemoglobin
HS	Highly significant
HTN	Hypertension
HU	House field unit
INR	International normalized ratio
IV	Intravenous
IVC	Inferior vena cava
IVU	Intra venous urography
KUB	kidney ureter and bladder

LIST OF ABBREVIATIONS (Cont...)

min	Minute
ml	Millimeter
mM	Millmole
N	Number
NS	Non significant
Op	Operative
PCS	Pelvicalyceal system
PNL	Percutaneous nephrolithotomy
RFs	Residual fragments
rpm	Revolution per minute
S	Significant
SD	Standard deviation
Sig	level of significance
TFE	Tetrafluoroethylene
UPJ	Uretropelvic junction
URS	Ureteroscopy
U/s	Ultrasonography
UTI	Urinary tract infection

Acknowledgment

*First and foremost, I thank **ALLAH**, the most merciful for guiding me through and giving me the strength to complete this work the way it is.*

*It is a pleasure to express my deepest thanks and profound respect to my honored professor, **Professor Dr. Mohamed Tarek Mohamed Fathy Zaher**, Professor of urology,Ain Shams University, for his continuous encouragement and valuable supervision and guidance throughout this work.*

*With considerable appreciation, I express my greatest thanks and sincere respect to **Ass. Prof. Dr. Mohamed Shokry Shoeib** Assistant Professor of Urology, Ain Shams University, for his kind supervision, active support and continuous encouragement throughout this work..*

*Words cannot suffice my sincere thanks and gratitude to **Dr. Samir Sayed Muhammad Azazy**, lecture of urology, Ain Shams University, for his great help and support and his continuous guidance, correction and explanation throughout the course of this work I wish to be able one day to return to him a part of what he had offered to me.*

*No words could adequately express my deepest appreciation to **my family**, for their continuous support. I shall remain indebted to them all my life.*

*Special thanks to **my colleages**, wishing them a happy and healthy life.*

Introduction

Since first removed a renal calculus through a nephrostomy tract in 1976, the technique of percutaneous nephrolithotomy PNL has significantly changed and is continuing to evolve. PNL is now a popular method for removal of renal and ureteral stones ***(Jou et al., 2004)***.

Placement of a nephrostomy tube after the completion of PNL has been considered as a standard procedure. The purpose of nephrostomy tube is to allow the renal puncture to heal, provide proper drainage of urine, tamponade of bleeding and permit access to the collecting system if a secondary procedure is required ***(Winfield et al., 1986).***

Tubeless PNL has been found to be feasible and safe in selected patients. However, it is still considered by many to be adventurous and risky ***(Shah et al., 2006) (a).***

Despite these advantages, the nephrostomy tube has been implicated in postoperative pain, leakage and prolonged hospital stay. To reduce this tube related complication, modifications have been described like the use of a smaller nephrostomy tube as in mini-PNL ***(Jackman et al., 1998) (a),*** or use of an external ureteric catheter or J-stent instead of nephrostomy catheters; this has since become known as tubeless PNL ***(Tefekli et al., 2006),*** or no ureteric stent have been implemented; this is called totally tubeless PNL ***(Crook et al., 2008).***

Instillation of a hemostatic agent as fibrin along the percutaneous tract may act as an adjuvant to tubeless PNL by minimizing hemorrhage and urinary extravasation in the postoperative period ***(Noller et al., 2004).***

Aim Of The Work

The aim of this work is to present our experience, evaluate tubeless PNL and to assess fibrin glue as a sealant agent in tubeless PNL.

Endourologic Anatomy Of The Kidney

General Anatomy

The kidneys are paired organs lie retroperitoneal on the posterior abdominal wall. They extend from the level of the 11th or 12th thoracic vertebra superiorly to the 3rd lumbar vertebra inferiorly with the right slightly lower due to the presence of the liver.The lateral surface of each kidney is convex; the medial surface is concave and has a vertical cleft called the renal hilum**,** which is bounded by anterior and posterior lips and contains the renal vessels and nerves and the renal pelvis. The relative positions of the main hilar structures are the renal vein (anterior), the renal artery (intermediate) and the pelvis of the kidney (posterior). On the superior part of each kidney lies an adrenal (suprarenal) gland **(Fig. 1)**. ***(Marieb et al., 2012).***

Position of the Kidneys

As the kidneys lie retroperitoneal against the psoas major muscles; their longitudinal axis parallels the oblique course of the psoas **(Fig. 1)**. As the hilar region is rotated anteriorly on the psoas muscle, the lateral borders of both kidneys are posteriorly positioned. It means that the kidneys are angled 30 to 50° behind the frontal (coronal) plane **(Fig. 2).** Therefore, the superior poles are more posterior than the inferior poles. So ,the distance from skin to collecting system is shortest at the upper pole and greatest at the lower pole of the kidney ***(Kim and Clayman, 2006).***

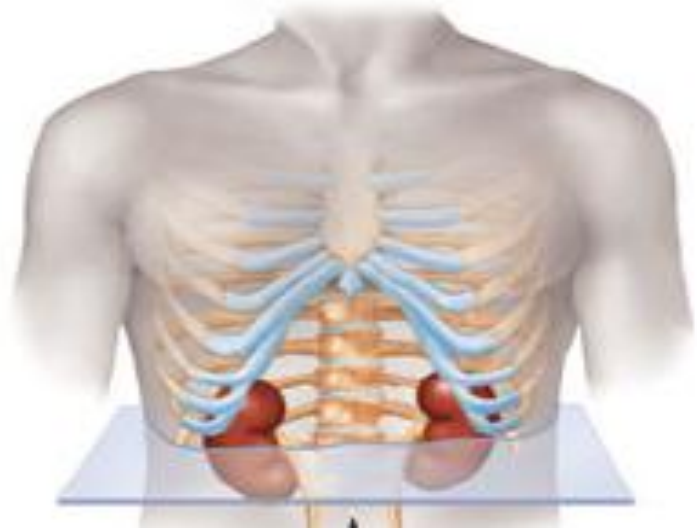

Fig. 1: Anterior view of the kidneys in relation to the skeleton, shows the longitudinal axes of the kidneys are oblique . ***(Marieb et al., 2012)***

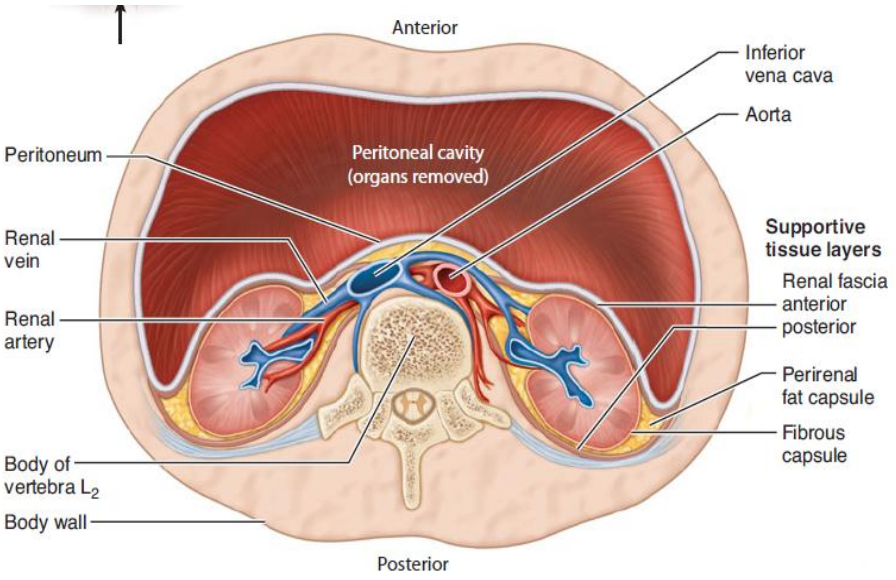

Fig. 2: Superior view of a transverse section of the kidneys shows that the kidneys are angled 30 to 50° behind the frontal (coronal) plane. ***(Marieb et al., 2012)***