Percutaneous Nephrolithtomy: Primary patients versus Patients with history of open renal surgery.

THESIS

Submitted for partial fulfillment for the Master Degree in UROLOGY

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2010

Abstract

- **Introduction:** PCNL is the procedure of choice for managing patients with renal stones.

- **Aim of the work**: To evaluate the safety and efficacy of PCNL in patients with and without a history of previous renal surgery.

- **Patient and method:** This is a prospective study carried out on 40 patients classified into two groups (group A: fresh cases and group B: recurrent ones). All patients were evaluated preoperatively by U/S, KUB, IVU, full lab investigations.

- **Result:** The mean age of our patients was 41.9 ± 11.1years, 31 males and 9 females. Although the operative time, the need for blood transfusion, postoperative hospital stay, and residual stones were found to be more in group B than group A, this was not found to be statistically significant. Moreover, the incidence of complications was found to be equivalent in both groups.

- **Conclusion:** PCNL is an equally safe and effective procedure for managing patients with renal stone in fresh and recurrent cases.

- Key word: Nephrolithtomy , Patients , UROLOGY

Acknowledgement

*First of all, all gratitude is due to **God** almighty who guided and aided me to bring to light this work.*

*I would like to express my deepest gratitude and sincerest thanks to Prof. DR, **Samih Zamel Sadek ,**Professor of urology , Faculty of Medicine ,Cairo University, for giving me the privilege to work under his supervision and for giving me his valuable advices .*

*Many thanks to Prof. DR, **Ragheb Elsergany** ,Assistant Professor of urology , Faculty of Medicine ,Cairo University, for unfailing support and encouragement throughout this work, without his Valuable instructions this work would never have come to light .*

*Words are not enough to express my great thanks and deep appreciation to Dr. **Mohamed Galal,** Lecturer of Urology, Faculty of Medicine, Cairo University, for his support throughout this thesis.*

*My deepest gratitude to **my parents and my wife** for their support and encouragement throughout my life, and for providing me the environment needed for concentration and progress.*

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Introduction

The lifetime prevalence of kidney stone disease is estimated at 1% to 15%, with the probability of having a stone varying according to age, gender, race, and geographic location. In the United States, the prevalence of stone disease has been estimated at 10% to 15% **(Norlin et al, 1976; Sierakowski et al, 1978; Johnson et al, 1979).**

The most common component of urinary calculi is calcium, which is a major constituent in nearly 75% of stones. Calcium oxalate makes up about 60% of all stones; mixed calcium oxalate and hydroxyapatite, 20%; and brushite stones, 2%. Both uric acid and struvite (magnesium ammonium phosphate) stones occur approximately 10% of the time, whereas cystine stones are rare (1%) **(Wilson, 1989).**

Since 1955, when Willard Goodwin and colleagues first described the use of a needle to decompress a hydronephrotic kidney, the discipline of endourology has grown to encompass a vast array of percutaneous procedures involving the kidneys and upper urinary tracts. **(Bernardo and Smith, 1999).**

Percutaneous nephrostomy is the cornerstone of every percutaneous procedure of the upper urinary tract. As a minimally invasive conduit to the pelvicalyceal system, the percutaneous approach provides a convenient route for management of upper

tract pathology. The majority of diseases affecting the upper urinary tract fall into one of four categories—(1) stone disease, (2) obstruction, (3) malignant or benign tumors, and (4) infection—percutaneous procedures have been used to manage most of these entities. **(Bernardo and Smith, 1999).**

Today, percutaneous nephrolithotomy (PCNL) is the management of choice for stones larger than 2 cm or for staghorn calculi. **(Preminger GM et al, 2000)**

Although percutaneous procedures of the kidney are associated with less morbidity than open surgery, the potential for significant complications still exists (Farrell and Hicks, 1997). Furthermore, although patient preference is not considered an absolute indication, patients generally favor the decreased morbidity of a percutaneous renal procedure to that of open surgery. **(Hofmann and Stoller, 1992; Giblin et al, 1995; Curtis et al, 1997; Pearle et al, 1998).**

For children, morbidly obese patients, patients with a history of open renal stone surgery, and patients with a solitary kidney special consideration should be given before choosing PCNL as a treatment option. (Skolarikos A, 2005). History of a previous open renal stone surgery, retroperitoneal scarring, pelvicaliceal distortion and, in some cases, bowel displacement are the major factors that should be taken into account by the surgeon confronting a percutaneous renal procedure**. (Kurtulus FO, 2008).**

Although the anatomic positional differences of the previously operated upon kidney (due to the resulting fibrosis) makes access and the procedure technically difficult, PCNL can be performed with low complication and high success rates if safety rules are followed strictly **(Kurtulus FO, 2008)**

Aim of work

This study is aimed to be a prospective comparative study to evaluate the safety and efficacy of PCNL in patients with and without a history of previous renal surgery.

RENAL ANATOMY

The kidneys are paired, reddish brown, solid organs that lie well protected deep within the retroperitoneum. Each kidney is about 11.25 cm. in length, 5 to 7.5 cm. in breadth, and rather more than 2.5 cm. in thickness. The left is somewhat longer, and narrower, than the right. The weight of the kidney in the adult male varies from 125 to 170 gm, in the adult female from 115 to 155 gm. The combined weight of the two kidneys in proportion to that of the body weight is about 1 to 240. A sound knowledge of renal anatomy is an essential prelude to all percutaneous maneuvers especially percutaneous nephrolithotomy **(Wickham and Miller, 2001)**.

■ Position of the kidney

The kidneys lie along the borders of the psoas muscles and are therefore obliquely positioned in the retroperitoneum. Accordingly, the lower poles of either kidney lie farther from the midline and are pushed slightly more anteriorly than the upper poles. The kidneys lie on each side of the vertebral column between the parietal peritoneum and the musculature of the posterior body wall. The position of the liver causes the right kidney to be 1 to 2 cm lower than the left kidney. The kidneys and associated adrenal glands are surrounded by perirenal fat, which is enclosed in perinephric fascia, known as the Gerota's fascia. The Gerota's fascia forms an important anatomic barrier around the kidney and

tends to contain pathologic processes originating from the kidney **(Harlod et al, 2003).**

▪Factors keeping the kidney in position

In addition to the Gerota's fascia, the vascular pedicle of the kidneys, the abdominal muscle tone, and the general bulk of the abdominal viscera support the kidneys. The kidneys are mobile organs and their positions varies with inspiratory or expiratory movement of the diaphragm as well as changes in position (**Hinman et al., 1993).**

▪Attitude of the kidney

The longitudinal axes of the kidneys are not straight, a degree of rotation always seen. This structure not only increases in bulk but also slopes forward in its caudal direction, thus creating the retroperitoneal gutters which are correspondingly shallow in the cranial direction and deeper in the caudal direction. The kidney which lies in the psoas muscle has an anterior surface, which is directed laterally and forwards and a posterior surface, which is directed medially and backwards. It therefore lies at approximately 25 degree to the coronal plane and lying in a posterior direction **(Wickham and Miller, 2001).**