Comparative Study Between Extra Corporeal Shock Waves Lithotripsy and Ureteroscopic Stone Extraction in Management of Upper and Middle Ureteric Stones

Thesis

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List of Abbreviations

Abb.	Full term
BMI	Body Mass Index
CT scan	Computed tomography scan
ESWL	Extracorporeal shock wave lithotripsy
Fr	French scale
HU	Hounsfield unit
IV	Intravenous
IVU	Intravenous urography
KUB	Kidney-ureter-bladder radiograph
MCCS	Modified Clavien Classification System
MRI	Magnetic resonance imaging
NCCT	Non-contrast spiral computed tomography
PAUS	Pelvi abdominal ultra sound
PCNL	Percutaneous nephrolithotomy
PL	pneumatic lithotripsy
SR URS	Semi rigid ureteroscope
SSD	Skin to stone distance
U/S	Ultrasound
UPJ	Ureteropelvic junction
URS	Ureteroscopy
UTI	Urinary tract infection
UVJ	Ureterovesical junction

Abstract

In our study we do comparison between extracorporeal shock wave lithotripsy and ureteroscopy in management of upper and mid ureteric calculi.

We concluded that ureteral stones 1cm or less in size can be treated safely and effectively by ESWL with a stone free rates more than pneumatic ureteroscopic lithotripsy, while in mid ureteral stones 1 cm or less in size can be treated safely and effectively by ESWL with a stone free rates equal to pneumatic ureteroscopic lithotripsy.

Most of the complications are minor and can be treated either conservatively or endourologically without further morbidity or mortality. ESWL and URS lithotripsy failures can be salvaged by further endourological procedures.

Key words: Extra Corporeal Shock Waves Lithotripsy- Ureteroscopic Stone Extraction- Middle Ureteric Stones

INTRODUCTION

Patients with urolithiasis constitute an important part of everyday urological practice. The optimal clinical management of this disease requires knowledge of the diagnostic procedures, the rational treatment of acute stone colic, stone expulsive treatment and the modern principles of stone removal. Management of renal and ureteric stones includes pharmacotherapy, extra corporeal shock waves lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL), flexible and rigid ureteroscopy and open surgery ***(Tiselius et al., 2011).***

In 1980, **Dr. Christian Chaussy** of the University of Munich was the first to treat renal stone in humans using a new concept termed extracorporeal shock wave lithotripsy. Using this technology, he determined that patients could have renal or ureteral stones removed without the need of an incision or skin puncture, due to its non-invasive nature ESWL has completely changed therapeutic strategies for urolithiasis, The first lithotripter model (Dornier HM-1™) was soon replaced by the (Dornier HM-2™) IN 1982, and the (Dornier HM-3™) in 1984.The HM-3 was first used in the United States on February 23rd, 1984 at Methodist Hospital in Indianapolis. With technological advances in lithotripter models, ESWL has become the preferred line of treatment for renal & upper ureteric calculi of <2 cm in diameter ***(Andreas et al., 2006).***

The outcome of ESWL depends on many factors, including stone size, location, composition, density (Hounsfield unit: HU), and the number of shocks delivered & skin to stone distance (SSD) ***(Tan et al., 2002).***

Extracorporeal shock wave lithotripsy (ESWL) represents a well established and effective therapeutical method for ureteric stones ***(Segura et al., 1997).***

The overall success rates have been reported to be or even overcoming 90% in many prospective studies ***(Wang et al., 2011).***

ESWL is a safe, non-invasive and effective method to treat a majority of stones with a minimal number of complications ***(Skolarikos et al., 2006).***

Even after successful treatment in terms of stone fragmentation, side-effects like renal colic and ureteric obstruction can occur. In rare cases a 'stein strasse' can develop, defined as an accumulation of fragments behind a leading, obstructing fragment ***(Skolarikos et al., 2006).***

The introduction of ureteroscope, as well as development of intracorporeal lithotripsy method has substantially improved the ureteroscopic (URS) manipulated stone free rate (71 – 78%) and significantly decreased the complication rate ***(Youssef et al., 2009).***

A combination of ureteroroscopy and intracorporeal lithotripsy has proven to be a viable alternative to ESWL ***(Tipu et al., 2007).***

ESWL remains the primary treatment modality for upper and middle ureteric calculi. However, some urologists have recommended ureteroscopic manipulation as first line treatment ***(Leistner et al., 2007).***

The debate still continues whether ESWL or ureteroscopic manipulation should be the first line of treatment for upper and middle ureteric stone.

AIM OF THE STUDY

The aim of this study is to compare between extracorporeal shock wave lithotripsy (ESWL) and ureteroscopic (URS) manipulation in the treatment of upper and middle ureteric stones as regard the stone free rate and the complications.