PRELIMINARY EXPERIENCE WITH EXTRACORPOREAL SHOCK-WAVE LITHOTRIPSY MONOTHERAPY AND BLADDER CALCULI

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ABSTRACT

During the period November 1988 to April 1989, eleven patients with bladder calculi, seen at our Centre, were offered ESWL therapy. However, only eight patients underwent ESWL. One patient passed his stone spontaneously, one requested endoscopic lithotrity as the initial mode of therapy and one underwent transurethral resection of the prostate and simultaneous endoscopic lithotrity of his bladder calculus. This series, though admittedly, small, nevertheless serves to introduce a safe and expeditious modality for the removal of bladder calculi. A high degree of patient acceptance and no treatment failures embolden us to advocate this modality as initial therapy for bladder calculi (JPMA 40:104, 1990).

INTRODUCTION

An Egyptian skeleton seven thousand years old provided the earliest record of a bladder stone[1]. Vesical calculi occur predominantly in males, only 2% occurring in females[2]. This male predilection is attributed to obstruction of the bladder neck secondary to bladder contracture, prostatic enlargement, urethral stricture, bladder diverticulum, cystocoele and neurogenic bladder; the denominator being obstruction to free flow of urine. This article serves to review our experience with use of Extracorporeal Shock Wave Lithotripsy (ESWL) as ipitial therapy for bladder calculi.

PATIENTS AND METHODS

A retrospective review of all patients requesting ESWL between November 8, 1988 and April 8, 1989 showed that eleven patients, all male, had bladder stones. Of these, eight underwent ESWL while one patient passed his stone spontaneously, one requested endoscopic lithotrity as the initial mode of therapy and one underwent trans urethral resection of the prostate with simultaneous endoscopic lithotrity of the vesical stone. Radiographic diagnosis with and without contrast enhancement complemented with cystoscopy were the main diagnostic modalities. Plain KUB X Ray was used to identify calculi at all levels of the urinary tract and IVP served to identify anatomical anomalies predisposing to calculus formation. Calculi at the ureterovesical junction were not included. Calculi were categorised according to their two largest dimensions. Serum profiles of urea, creatinine, potassium, calcium, phosphate and uric acid were obtained. Complete urinalysis and culture were obtained. A Siemens second generation (LithostarTM) lithotripter with two electromagnetic energy sources, a lens focusing device, membrane coupling and biplanar XRay localisation was used. Prone position with five milligrams of intravenous diazepam was used in all patients. Single sessions of prone ESWL were used in all patients ranging from 1763 to 4000 shock waves at 19.0 kilovolts. End point of therapy was determined by fluoroscopic appearance of the treated calculus. Plain KUB X-Rays were obtained to document fragmentation, confirm voidability of fragments and identify residue at 24 hours and four weeks post litbotripsy.

RESULTS

The series included eleven male patients with ages ranging from-25 years to 71 years, of whom eight underwent ESWL. Two patients presented with acute urinary retention due to the calculus being lodged at the internal urethral meatus. Frequency was the most common symptom. Three males had a mild enlargement of the prostate on rectal palpation. Serum profiles of uric acid, calcium, phosphorous, urea,and creatinine were within normal ranges. Plain KUB X Rays showed associated right renal stones in two patients. Only single vesical calculi were identified. IVP did not show any anatomical abnormality except residual urine in three post micturition films. Cystoscopy showed prostatic enlargement with bladder trabeculation in three patients.

TABLE. Data obtained after prone ESWL and all bladder calculi.

Initial	Stone size (cms)	ESWL waves	Position	KUB X-ray at 24 hours	4 weeks.
MM	1.6 x 1.6	3600	Prone	Clear	Clear
SH	1.5 x 1.3	3600	Prone	Clear	Clear
HA	2.0x1.0	2800	Prone	Clear	Clear
NA	1.0X1.0	3000	Prone	Clear	Clear
MK	1.0x1.0	2000	Prone	Clear	Clear
MA	1.0x1.0	1763	Prone	Clear	Clear
KH	1.2x0.6	4000	Prone	Clear	Clear
SA	0.5 x 0.7	3600	Prone	Clear	Clear

The accompanying table shows the response of the bladder calculi to ESWL. No clear correlation could be drawn as to size and number of shock-waves required. Fluoroscopic appearance was the main criterion for completion of therapy. Post ESWL no gastrointestinal complaints were observed. Transient hematuria occurred in all patients which stopped spontaneously within 24 hours. All patients reported passage of fragments per urethra. Two patients with prostatic enlargement required Foley's catheterisation for urinary retention; the catheters were removed 24 hours later. These patients were advised to undergo transurethral resection of the prostate. Check X Ray obtained at 24 hours and four weeks were uniformly clear in all patients.

DISCUSSION

Calculi in the bladder are mostly single but upto 25-30% may be multiple, especially those associated with bladder diverticula. At present, cystolithotomy, electrohydraulic lithotripsy and endoscopic Ihhotrity are the main modalities to treat bladder stones. The advantages that ESWL offers to each of these is that no endoscopic manipulation is required, only intravenous sedation is used and no hospital stay is necessary. Further the complications of wounds, anaesthesia and surgery that may occur are avoided. Lastly, time away from work is minimized. The presence of an expansion space and a stone fluid interface are the prerequisites of successful ESWL. A patent distal outflow tract is also necessary. Prone positioning allows for more efficient shock wave transmission. [3] The patient must be made

aware that even though stones can be pulverized to a very small size to facilitate evacuation, outlet obstruction to the distal urinary tract will require defmitive surgical treatment in order to prevent recurrence. In view of our. experience we would suggest that ESWL for bladder calculi presents a viable option prior to more invasive techniques.

REFERENCES

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