ORIGINAL PROF-475

EXTRA-CORPOREAL SHOCK WAVE LITHOTRIPSY;
EARLY EXPERIENCE WITH CHINESE LITHOTRIPTOR AT LARKANA

Dr. Abdul Rasheed Shaikh
Assistant Professor Urology
Chandka Medical College, Larkana.

Dr. Nisar Ahmed Shaikh
Registrar Depart: of Urology
Chandka Medical College, Larkana.

Dr. Abdul Rahim Siyal
Assistant Professor Pathology
Chandka Medical College, Larkana.

ABSTRACT

OBJECTIVES: To evaluate the early results of experience of ESWL to the effectiveness of Chinese lithotriptor. **PERIOD**: From May 1999 to October 1999. **SETTING:** Almas Medical Lithotripsy Center, Larkana. **RESULTS**: Fifty patients having renal and upper ureteric stones were treated with Chinese lithotriptor. **PATIENTS AND METHODS**: The stone imaging and localization was done with the help of fluoroscope. The ages of the patients ranged from 10-52 years (average: 32 years). 17(34%) were males and 33(66%) were females. Forty two patients had renal stones and 08 had upper ureteric stones. Simple analgesic and sedation was used before the procedure on 1st sitting. The over all stone free rate after 3 months of treatment was 78%. Five patients (10%) were dropped from the list because of failure of treatment. Remaining 6 patients (12%) showed partial fragmentation and residual stone in lower calyx. We noticed few transient complications including colic and haematuria which were managed easily. **CONCLUSION:** We conclude that the Chinese lithotriptor was as effective as other lithotriptors. It is also cost-effective.

KEY WORDS: Renal stones, ESWL, Chinese Lithotriptor.

INTRODUCTION

Stone disease of the urinary tract is one of the oldest disorders[1] and is common cause of affliction of the urinary tract. Both sides are equally affected and about 40% of patients have bilateral stones[2].

Geographically, the disorder is widely spread. It is more or less endemic in agricultural and developing countries, where soil, diet, drinking water, climate

and so many other factors, influence the stone prevalence. Pakistan also comes within stone belt of world[3].

Various modalities of treatment are available. Among these surgery has been the most important modality but at the cost of morbidity. In last two decades modern technology revolutionized the surgical treatment. The dream of non-invasive technique became true with the invention of shock wave lithotripsy technique on 7th Feb 1980[4]. Then it became primary modality of treatment for renal calculi[5].

Various lithotriptors like dornier, lithostar, modulith SL-20 and EDAP LT 02 are available. These have high initial and running cost, whereas Chinese lithotriptor is, far less costly in both the aspects. The aim of our study was to demonstrate the role of ESWL in the management of upper urinary tract stone and to evaluate the efficacy, complications and cost effectiveness.

PATIENTS AND METHODS

This is a prospective evaluation of 50 selected patients with renal and upper ureteric stones. They were treated with piezo-electric Chinese flouroscopic based lithotriptor between May 1999 and October 1999 at Almas Medical Lithotripsy Center, Larkana. On each session of treatment, 2500 shocks of 14 KV were given in supine position to patients on out door basis.

The analysis was done according to history and thorough physical examination. The investigations included complete blood count, blood urea, serum creatinine blood sugar, urine analysis, ultrasound and intravenous urography.

Patients with distal obstruction, having stones larger than 2 to 2.5 cm in diameter, pregnant ladies and those with poor kidney function were excluded from the study. Prophylactic antibiotics were used in few patients with history of urinary tract infection. Anaesthesia was not used. However some intra muscular analgesic or intravenous sedation was given on 1st session or on the following sessions if requested by the patients. D-J sent was not used in any case. Patients were followed on fortnightly basis till clearance of the stone fragments. Failure of treatment was considered in cases where stone remained unchanged after 3 sessions of treatment. Check KUB x-ray was routinely advised.

RESULTS

Fifty patients with renal and upper ureteric stones were selected for lithotripsy therapy. Out of them 17(34%) were male and 33(66%) were females. The ages of the patients ranged from 10-55 years with average of 32 years (Table I). Renal stones were present in 42 patients with 27(54%) on right side and 15(30%) on left side. In the remaining patients stones were present in upper ureter.

Table I. Age and sex distribution.

Age (Years)	Male	Female	Total
11-20	02(4%)	0	02
21-30	06(12%)	14(28%)	20
31-40	04(8%)	13(26%)	17
41-50	03(6%)	05(10%)	08
51-60	02(4%)	01(2%)	03
		Total	50

Sizes of stones ranged from 1.5 cm to 2 cm in diameter. The number of ESWL treatment sessions per patient varied from 1-7 with average of 4.5 sessions. The duration of each ESWL session varied from 40 to 50 minutes.

The clearance of the stone was achieved in 39(78%)

patients of whom 34 were renal and 5 were ureteric. Distribution of patients according to number of treatment sessions is shown in table II. Treatment failed in 5(10%) patients in whom 3 were renal and 2 were ureteric stones. These patients were later subjected to surgery. In another 6(12%) patients the response was partial, nevertheless they became pain free with passage of some fragments of the stones. However check KUB x-ray revealed residual stone mainly in the lower calyx despite repeated treatment sessions.

Table II.
Distribution of treatment sessions in successful cases.

	No. of treatments	Shock per patient
No. of patients with renal stone (n=34)		
05(10%)	02 Sessions	5000 at 14 KV
13(26%)	04 Sessions	10000 at 14 KV
06(12%)	05 Sessions	12500 at 14 KV
07(14%)	06 Sessions	15000 at 14 KV
03(6%)	07 Sessions	17500 at 14 KV
Patients with ureteric stone (n=05)		
02(4%)	01 Sessions	2500 at 14 KV
03(6%)	04 Sessions	10000 at 14 KV

Table III. Complications of Chinese lithotriptor.

Complications	No. of patients	%age
Renal/Ureteric Colic	09	18%
Residual fragments	06	12%
Haematuria	05	10%
Steinstrasse	02	04%
Urosepsis	01	02%

Complications noted in our patients are listed in table III. They were renal/ureteric colic in 9(18%) patients, transient haematuria in 5(10%), steinstrasse in 2(4%) and urosepsis in 1(2%) patient.

DISCUSSION

Since decades, surgery has been the most common modality of treatment for stone disease but nowadays it is being used only in limited number of patients. Although the results of surgery are very much favourable but it is associated with long surgical incision, significant blood loss, post operative pain, prolonged convalescence (4-6 weeks), wound dehiscence, ugly scar, incisional hernia and prolonged hospitalization[6].

From 1980s modern technology dramatically revolutionized the surgical management of stone disease. These are per-cutaneous nephrolithotomy and extra-corporeal shock wave lithotripsy[7].

The advent of new 2nd and 3rd generation of lithotriptor after 1987 made it possible to treat patient on out door basis. As different types of lithotriptors are available, therefore our main aim is to elaborate an objective comparison of various lithotriptors installed in different centers with its efficacy on different size of stones at different levels along with running cost.

In our first 50 cases who underwent for ESWL therapy with Chinese lithotriptor. The overall success rate (stone free) was 78% within 3 months period. These results are slightly lower, when compared to reports of Dornier HM3[8] and lithostar HM3[9] which showed 90% and 92% stone free rates respectively.

Comparison of result with other lithotriptors are shown in table IV. Cole et al in 1988[10] reported 80% stone free rate which is very close with our results. Our results are comparable to the results of

Tung 1990[11] and Robert 1995[12] using EDAP LT O2 lithotriptor. They showed 75% and 76% stone free rates respectively. Our results are low when compared to Dornier HM3 or to lithostar (Table IV). It may be due to different sizes of stones or treatment done at different voltage. We operate at 14KV. Although this may need more sessions but the advantage is that it is relatively painless. Thus it is highly acceptable by patients even, the children.

Table IV. Comparison of stone free rate with different lithotriptors.

Lithotriptor	Stone free rate	Study
Chinese LT3	78%	Present study
Dornier HM3	90%	Umeyama et al 1990[8]
Lithostar HM3	92%	Rodriguez N et al 1990[9]
Storz Modulith	92%	Liston et al 1992[17]
EDAP LT O2	75%	Tung et al 1990[11,18]
EDAP LT O2	76%	Robert 1995[12]

In our series 5(10%) patients (3 renal and 2 ureteric) did not show any change in size of stone with 3-4 session of treatment. Obesity could be a factor which was presented in our 3 patients. In remaining two patients we could not found any definite cause.

Regarding partial fragmentation and residual stones which were observed in 6(12%) patients, our findings are comparable with Grace 1989[13] who also demonstrated a linear relationship between stone size and number of shock waves sessions required to achieve fragmentation. Although stone density is also important but stone burden is directly related to multiple sessions of treatment and are associated with more morbidity[14].

Dretler in 1990[15] stated that ESWL is not appropriate for larger stone because its debris causes ureteric obstruction. For these reasons we excluded patients with multiple stone from the treatment. More over the accessory like PCNL was also not available to us at Larkana.

The complications of ESWL treatment are listed in Table III. The two most common complications were renal/ureteric colic (18%) and haematuria (10%). These patients were managed easily on conservative treatment.

We observed that the cost per patient successfully treated with Chinese lithotriptor is very low as compared to others. This is also in accordance with the view of Junaid 1992[16] who reported that initial and running cost of the Western made lithotriptor is 10 times greater than the Chinese lithotriptor.

CONCLUSIONS

ESWL is an outstanding method of treatment which provides a non invasive, simple and safe option for the management of upper renal and ureteric stones. As there is not much difference between the out come of different lithotriptors and keeping in view, the efficacy, safety, initial and running cost of Chinese lithotriptor, we are confident to say that it is ideal for the under developed countries like Pakistan.

REFERENCES:

1. Robertson and Peacock: Urinary calculi. In post graduate nephrology (ed.) Frank Marsh, William Heinemass Medical book Ltd. London (1985):354-355.

2. Smith LH. The Medical aspects of urolithiasis: An overview J. Urol: 1989: 141 Part-2: 707-710.

3. Khan FA and Khan JH: Stone surgery of the Punjab Hospital. Pak: Post Med: J 1990;1:7-13.

4. Krishna MV, Steven B. Stream: Long term radiographic and functional out comes of ESWL

induced peri-renal haematoma J. Urol 1995:154:1673-1675.

5. Kim SC, Ohew, Moon YT, Kim KD. Treatment of steinstrasse with repeat ESWL with Piezoelectric lithotriptor J. Urol 1991; 145:489-491.

6. Drach GW. Surgical over view of urolithiasis J. Urol:1989:141 Part-2:711-713.

7. Masuda F. Open surgery for urinary stones. Asian Medical J. 1987; 30(2), 74-80.

8. Umeyama T, Kawada T, Takhoski, Treatment of (465) ureteral calculi by ESWL Nippon-Hinyokika-Gakkai-Zaashi 1990:81:868-872.

9. Rodriguez Netto J & N, Lmos GC, Claro JF. In situ ESWL for reteral calculi. J Urol 1990;144;253-254.

10. Cole SR, Shuttle work K.E.D. is ESWL Suitable treatment for lower ureteric stone Br J Urol 1988:62:525-30.

11. Tung KH, Tan KC, Foo KT in situ, ESWL for upper ureteric stone using EDAP LT: 01 lithotirptor. J. Urol 1990; 143:481-482.

12. Robert M, Delboso, Guiter J and Grasset D. In situ piezoelectric ESWL of ureteric stone BJU 1995:76:435-439.

13. Grace PA, Gillen Psmith JM and Fitzpatrick. ESWL with the lithostar lithotriptor Br J Urol 1989; 64:117-121.

14. Lingeman JE, Smith LH, Woods JR and Newman DM: Cost effective of urolithiasis option: In, Urology calculi, Lea and Febiger, Philadelphia 1989:397.

15. Dretler SP, Ureteral stone disease option for management Urol Clin North Am 1990:17:217-30.

16. Junaid HK, Safdar HJ, Saleem I, Zahid I and Khan FA. Roll of ESWL in management of upper urinary tract stone disease. Pak Post graduate Med: J 1992; 3(3-4):87-94.

17. Liston TG, Mantgomery BSI, Bultitude MI and TI Ptoft RC: Extracorporeal shock wave lithotripsy with the storz modulith SL 20: the first 500 patient Br J Urol:1992; 69:459-465.

18. Raja Gopal V, Bailey MJ. Mobile ESWL Br J Urol 1991; 67:6-8. Tung KH, Tan KC, Foo KT. In situe. ESWL for upper ureteric stone using EDAP Lt:01 Lithotriptor J. Urol 1990:143:481-2.

It is the province of knowledge to speak and it is privilege of wisdom to listen.

Oliver Wendell Holmes