

INTRACORPOREAL CYSTOLITHOTRIPSY IN CHILDREN

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ABSTRACT**Objective:** To evaluate safety, morbidity and complication of intracorporeal cystolithotripsy in children.**Design:** It was a prospective study.**Place and Duration of Study:** The study was conducted from February, 1998 to January, 2000 at Almas Kidney and Lithotripsy Centre, Larkana.**Patients/Methods:** In all 50 children with single or multiple vesical calculi measuring < 2.5cm in diameter were selected on the basis of routine clinical examination, laboratory investigations, X-rays, ultrasoundgraphy etc, for intracorporeal cystolithotripsy with Swiss Lithoclast.**Results:** Average age of the patients was 4.5 years. Male to female ratio was 7.3:1. The stones were removed successfully in all the cases. The complications like urethral bleeding and infection occurred in 07(14%) cases. Hospital stay was merely a day in all the cases.**Conclusion:** This method of treatment was simple, safe and effective in majority of children having vesical calculi.**KEY WORDS:** Child. Bladder calculi. Lithotripsy.**INTRODUCTION**

Urolithiasis is the commonest urological ailment in Pakistan.¹ Vesical calculi have afflicted humans since pre-historic time. Although, the incidence has decreased with the passage of time and industrialization, it is still common in infants and children in the developing countries.² Generally they affect children under 10 years of age.³

Various modalities of treatment are being practiced. With all the options of treatment, the method of choice should be both relatively non-invasive and expeditious. Although, the open cystolithotomy procedure is still popular, now-a-days its usage is occasionally needed.⁴ The role of extra-corporeal shock wave lithotripsy (ESWL) is restricted to vesical calculi due to high retreatment rate, difficulty in the voiding of fragments in children. Now-a-days, vesical calculi are generally removed by cystoscopic (litholapaxy) method. This is the procedure of choice in adults but cannot be used commonly in children due to the large size of the instruments as compared to the size of the urethra.⁵ Blind (tactile) litholapaxy is an outdated procedure and counted among the ancients. Noorani beautifully modified its use by making it optical through veress needle.⁵ Although, it is the cheapest method, it is associated with some risk factors.⁶

Recently, with the advent of new urological armamentarium, the cystoscopic removal of stones is made possible in children. For this purpose four intracorporeal techniques are available to fragment stones in the urinary tract. These are ballistic (pneumatic), ultrasound, electrohydraulic and laser lithotripsy. Their therapeutic efficacy has been well-evaluated

and compared since long in adults but not in children. The objective of our study was to evaluate intracorporeal cystolithotripsy with Swiss Lithoclast (pneumatic lithotripter) in bladder stones of children and to see its benefits in terms of safety, morbidity, and complications.

PATIENTS AND METHODS

This study was conducted at Almas Kidney and Lithotripsy centre, Larkana, from February, 1998 to January, 2000. A total of 50 children with vesical calculi were selected for the study. The criterion for selection of the patients was the presence of single or multiple vesical calculi measuring radiologically by less than 2.5 cm in diameter. The patients, who had associated lower ureteric stones, congenital anomalies like posterior urethral valve, vesico-ureteric reflux and hypospadias etc or patients with urinary tract infection, were excluded from the study. Screening workup included complete history, clinical examination and investigations like urine DR, complete blood count and biochemistry, ultrasound, X-ray KUB and X-ray chest. Intravenous urography (IVU) and micturating cystourethrography (MCUG) were performed in some of the cases where it was indicated.

EQUIPMENTS AND TECHNIQUE

Swiss Lithoclast is a pneumatic lithotripter used for the intracorporeal disintegration of urinary calculi. Compressed air is used in hand piece to generate ballistic energy. This energy in the form of a perfectly controlled acoustic pressure wave is transmitted from hand piece to calculus through specially-made semi-rigid probe.

The procedure was performed under general anesthesia (semi closed) in lithotomy position. The urethra was dilated up to 12Fr. The pediatric cystoscope (Wolf, Germany) with angled eyepiece and straight working channel was used. All the stones were disintegrated into tiny fragments. Then, the cystoscope was replaced by 12Fr sheath to extract out fragments. If check cystoscopy revealed larger residual

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fragment(s), the procedure was repeated. At the end of procedure, 10Fr foley catheter was left behind which was removed the next day. The children were followed up weekly for a month and were advised to come back if they experience any problem.

RESULTS

Our study included 50 children. Among them 44 were boys. The male to female ratio was 7.3:1. Their ages ranged from 1 to 9 years (average 4.5 years). The average stone diameter was 1.82 cm (range 1.2 to 2.5 cm). The stones were removed successfully in all the cases. The duration of procedure ranged from 15 to 65 minutes, average being 35 minutes. The complications occurred in 07 (14%) cases were urethral bleeding in 3 (6%) and infection in 4 (8%) cases. Hospital stay was merely a day in all the cases. During the follow-up transient voiding disturbance was observed in 5 (10%) cases. These were resolved within 72 hours of conservative treatment.

DISCUSSION

Since decades, open surgery has been the most important modality for bladder stone disease. Recently, it is being used only in a limited number of patients. Though, it is claimed to be a safe and most effective method of treatment it is associated with problems like wound dehiscence, ugly scar, blood loss, pain, leakage of urine and prolonged hospitalization.⁷

In our study, the stones were disintegrated and retrieved successfully in all the cases. Similar favorable results had been documented from many distinguished centres of the world.⁸⁻¹² In our series the complication namely urethral bleeding and infection occurred in 07(14%) cases. The urethral bleeding occurred due to urethral dilating procedure in children below the age of 02 years. Keeping in view the complications of dilating procedure, we are of the opinion that the children under the age of 02 years should not be subjected to this much dilatation; rather smaller sized sheath should be used. The infection was noted in cases that were already catheterized. Shokeir in 1994 and Mosbah in 1995 had reported 100% success rate with no morbidity. This may be justified on the basis that the series of former author comprises the patients who had stone with average diameter of 1.1 cm, whereas the latter authors presented a small series of 07 cases only.^{10,11}

Comparison between usages of various intracorporeal lithotriptors was done in many other centres that revealed the lithoclast a more successful, quick and safe device. Moreover, it has been found to be most efficient for larger and harder stones than other lithotriptors.¹³ Its major advantage is that it is about ten times cheaper than laser and also simple in use.¹⁴ Regarding relative risk of iatrogenic trauma to urothelium, it was observed that lithoclast causes least damage when compared to laser and electrohydraulic lithotripter.¹⁵ In this context Halfbauer recommended that the constant direct vision must be maintained and no energy is applied until and unless there is a contact between stone and probe.⁸ Many authors warrant its safe usage, as it does not generate heat or expulsion.⁸⁻¹²

CONCLUSION

We conclude that this method intracorporeal cystolithotripsy with Swiss Lithoclast is simple, effective, safe and associated with low complications. We recommend that lithoclast is affordable in a poor country like ours and should be broadly applied at district level.

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