ABSTRACT

Introduction: Bladder lithiasis makes up about 5% of all urinary tract lithiasis. Its existence has been known since 4800 B.C.E. Treatment has been modified throughout the history of open surgery leading to the present day minimally invasive procedures.

Objective: The purpose of this study is to present a percutaneous technique for extracting bladder calculi using Amplatz dilators and sheaths.

Materials and Methods: Patients who sought medical attention in the urology service for bladder lithiasis from June 2006 to July 2007 presenting with bladder calculi between 1.8 and 3 cm in diameter were included in the study. Transurethral resection of the prostate was carried out with Amplatz trocar followed by percutaneous extraction of the stone.

Results: A total of 12 patients were operated on for bladder lithiasis associated with infravesical obstruction. All patients were men and their ages ranged from 35 to 76 years. Eleven of the patients presented with obstructive prostatic growth and one with urethral stenosis. There were no complications resulting from the procedure.

RESUMEN

Introducción: La litiasis vesical constituye alrededor del 5% de todas las litiasis del tracto urinario. Existen evidencias de su presencia desde el año 4,800 a.C. El tratamiento se ha modificado a través de la historia de la cirugía abierta hasta su resolución actual, mediante procedimientos mínimamente invasivos.

Objetivo: El propósito del estudio es presentar la experiencia con una técnica percutánea para la extracción de litos vesicales, utilizando los dilatadores y camisas de Amplatz.

Material y métodos: Pacientes que acudieron al servicio por litiasis vesical de junio del 2006 a julio del 2007, todos ellos con litos vesicales entre 1.8 y 3 cm de diámetro. Se realizó resección transuretral de próstata con la utilización del trocar de Amplatz como se describe en la técnica en un tiempo inicial y seguido de la extracción percutánea del lito.

Resultados: Se operaron un total de doce pacientes con litiasis vesical asociada a obstrucción infravesical, todos ellos con litos vesicales menores de 3 cm. No se presentaron complicaciones inherentes al procedimiento.

Conclusiones: La cistolitotomía percutánea extractiva es un método práctico, seguro y económico para la resolución de litos vesicales menores de 3 cm. La ventaja de utilizar esta técnica es la rapidez del procedimiento y no requiere de utilización de litotritores.

Palabras clave: litiasis vesical, cistolitotomía percutánea.
Conclusions: Extractive percutaneous cystolithotomy is a safe, practical and economic method for treating bladder calculi that are smaller than 3 cm. The advantage of this technique is the speed with which it is carried out and the fact that it does not require the use of lithotriptors.

Introducción
Bladder lithiasis is a frequent pathology and makes up 5% of all urinary tract lithiasis. A large number of cases are associated with obstructive pathology, particularly benign prostatic growth and urethral stenosis in men, neurogenic bladder, foreign bodies, diverticuli and neobladders. Bladder lithiasis has been known to exist since the beginning of civilization. Stones have been found in Egyptian mummies dating from 4800 B.C.E. (1). Lithiasis was treated with open surgery for centuries. Over the last years there have been advances and in addition to open cystolithotomy, endoscopic lithotripsy with pneumatic, holmium laser and electrohydraulic equipment or extracorporeal lithotripsy have become treatment alternatives (2). Combined techniques have been proposed using percutaneous trocars, Hasson cannulas and Amplatz trocars and dilators (3). Some authors describe the use of endobags for stone extraction. We are reporting our experience with a series of 12 patients treated with Amplatz dilators and sheaths to create a suprapubic tract in which obstruction due to prostatic growth (and in one case from urethral stenosis) had been previously resolved.

Materials and Methods
All patients seen in the Urology Service from June 2006 to July 2007 for bladder lithiasis with stones smaller than 3 cm in diameter were included in the study. Patients were hospitalized the day of surgery or one day before and were released from 24 to 72 hours after the procedure (mean 2.3 days). Urinary irrigation was used in all patients at the minimum drip required for avoiding blood clot formation. Irrigation was suspended in all patients within the first 24 hours. Cystostomy catheter was removed 1 to 4 days (mean 1.2 days) after procedure depending on bleeding and leakage around the catheter. Transurethral catheter was left in place for 5 to 7 days (mean 5.8 days). Patients received out-patient surveillance with urine tests and cultures. They received antibiotic treatment determined by antibiogram if any of the tests were positive.

Technique: A 7F trocar, 6F caliber open end ureteral catheter, 24 and 30F Amplatz dilators, 30F teflon and/or metal sheaths and a 24F fenestrated sheath plus a Forester tweezer (Image 1) were used. Under local anesthesia, 11 patients underwent calibration and/or dilatation of the meatus up to 28F with a progressive dilator. A resector with a 26F sheath was then introduced by direct vision without difficulty and cystoscopy was carried out to verify the presence of stones, their size and characteristics. It was done with a 2-3 cm incision approximately 2 cm above the pubic bone reaching the aponeurosis of the anterior rectus muscles. Puncture was made with a 7F trocar under endoscopic control (Image 2) through which a 6F open end catheter was left in place inside the bladder (Image 3). Guided by the ureteral catheter, the dilator from the 30F Amplatz set was passed, calculating the necessary distance by direct vision (Image 4). With a gentle rotating movement a 30F metallic sheath was passed over the dilator and left floating inside the bladder (Image 5). Transurethral resection was initially carried out and...
This made it possible to place a two-way 22F Foley catheter through the cystostomy opening, inflating the balloon 10 to 20 cm. It was maintained with light traction which reduced the urine leakage around the catheter (Image 7).

A 20 or 22F three-way Foley catheter was placed transurethrally and irrigation was maintained in the first 8 to 24 hours in one of the catheters. Cystostomy was removed 1 to 4 days later (mean 1.2 days). Urethrotomy with a 20F Schaze urethrotome was performed on the patient presenting with annular bulbar urethral stenosis. The bladder was then distended to carry out the percutaneous procedure.

The majority of fragments emerged through the trocar. The rest were extracted with an evacuator through the transurethral sheath. After the resection was completed and the fragments were evacuated and homeostasis was verified the Amplatz sheath was removed. The catheter was left in place as a guide so that the tract would not be lost. A ring tweezers was then introduced and under endoscopic control the stone was grasped, positioning it according to its widest longitudinal diameter so it could be extracted (Image 6).

A 24F dilator was then introduced over the catheter guide and so was the fenestrated sheath.
RESULTS

Twelve patients were operated on within the previously described time frame. All patients were males from the ages of 35 to 76 years with a mean age of 63 years. Eleven of the patients presented concomitantly with prostatic obstruction and the remaining patient was a minor presenting with annular bulbular urethral stenosis. Transurethral resection of the prostate was carried out in 11 patients using Amplatz trocar as described above and then it was followed by percutaneous stone extraction. Cold knife optical urethrotomy and percutaneous cystolithotomy were carried out in the remaining patient. Time in surgery did not exceed 10 minutes after having performed resection of the prostate and having resolved urethral stenosis.

Transurethral resection of the prostate took a mean 42 minutes with a 19 to 68 minute range. The stone was completely extracted in 10 of the patients while in 1 patient the stone broke up as it was being extracted leaving small fragments in the abdominal wall, the majority of which were able to be removed.

Cold knife urethrotomy was carried out on the remaining patient of the twelve followed by percutaneous cystolithotomy. It only took five minutes to create the tract and introduce the ring tweezers. The stone had a 1.8 cm diameter and was easily extracted. It was decided to place a 16F catheter that was open at the tip by introducing it through the open end catheter. It was removed the next day together with the transurethral catheter. At follow-up one of the resected patients developed meatal stenosis and required meatotomy. Patients had a 2 to 14 month follow-up (mean 7.8 months) with no late complications. At 4 months after procedure the patient who underwent urethrotomy clinically presents with good micturition mechanism and uroflowmetry with a Qmax of 14 ml/sec.

DISCUSSION

Many techniques for resolving bladder lithiasis have been described. The tendency is to carry out minimally invasive procedures which allow the patient to have a faster recovery period and less pain (1-3). However, many of these techniques require the use of lithotriptors and are not always available in our work environment. Transurethral resection performed in conjunction with bladder lithotripsy is common given that bladder lithiasis is frequently the consequence of infravesical obstructive uropathy. However, it has been reported that lithiasis resolution significantly reduces the International Prostate Symptom Score (IPSS). In some patient series with long-term follow-up who had undergone only prostate resection, 8% of them maintained IPSS indices above 20 points (4). In our experience we consider transurethral resection of the prostate using the Reuter trocar and Amplatz sheaths and dilators even in cases of significant prostatic volumes associated with large bladder stones and in high risk surgical patients (5,6) to be a safe, efficient and economic method. On the other hand, percutaneous techniques allow the use of nephroscopes with a straight work canal in which pneumatic lithotriptors may be successfully employed (7). The advantages of percutaneous methods are short time in surgery, little or no morbidity, short hospitalization and less pain than with other techniques. We feel that the installation of a suprapubic tract with the Amplatz set allows large stones to be treated through the use of pneumatic lithotriptors and is especially useful when treating children and patients presenting with diversions and neobladders, as has been suggested by different authors (8, 9). Another minimally invasive bladder lithiasis treatment possibility is extracorporeal shock wave lithotripsy (ESWL). Fifty-five to 73% of cases have been resolved with this technique and sometimes in a single session. Two or more sessions may be needed, depending on the size of the stone. This is a principal factor in the success of this therapy (10,11).

Its disadvantages are high cost and the inability to simultaneously resolve obstructive pathology in the majority of bladder lithiasis patients.

CONCLUSIONS

Bladder lithiasis is frequently associated with obstructive pathology in the male and requires resolution in a single surgery. The technique we employ facilitates TURP and percutaneous extraction of stones smaller than 3 cm in the same tract without the use of lithotriptors. This procedure results in less time in surgery, zero morbidity and slight postoperative pain. It is a practical, economic and easily reproducible technique.

BIBLIOGRAPHY

