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NEW TECHIQUES AND TECHNOLOGIES

Combination of extracorporeal lithotripsy and flexible ureterorenoscopy optimize renal lithiasis therapy☆

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Abstract
Objective: Describe our initial experience in the treatment of renal lithiasis with extracorporeal lithotripsy controlled by simultaneous flexible ureterorenoscopy and combined with holmium laser lithotripsy.
Material and methods: We performed this novel technique in a previously selected patient with left renal lithiasis, two in the superior calix, two in the medium calix and two in the inferior calix, the biggest of which was placed in medium calix and was 6 mm long. We proceeded to an extracorporeal shock wave lithotripsy and a simultaneous flexible ureterorenoscopy for better controlling the fragmentation of the lithiasis with the use of a holmium laser. In the immediate post-operative, an ultrasound was performed and, one month later, a computerized tomography (CT) was done.
Results: The complete fragmentation of all the lithiasis was obtained and a double-J catheter was placed. After the assessment of the absence of stone fragments by CT the catheter was removed. No intra-operative or post-operative complications were described.
Conclusions: The technique described is novel, safe and reproducible. The good result obtained through this combined technique increases our interest in continuing with its application and consider it as an option for the treatment of renal lithiasis in our patients.

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PALABRAS CLAVE
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La combinación de litotricia extracorpórea y ureterorrenoscopia flexible optimiza el tratamiento de litiasis renales

Resumen

Objetivos: Describir nuestra experiencia inicial en el tratamiento de las litiasis renales mediante litotricia extracorpórea controlada por ureterorrenoscopia flexible simultánea y combinada con litotricia mediante láser holmium.

Material y métodos: Llevamos a cabo esta novedosa técnica en una paciente previamente seleccionada que presentaba litiasis renales izquierdas, 2 en cáliz superior, 2 en cáliz medio y 2 en cáliz inferior, la mayor de ellas en cáliz medio de 6 mm. Realizamos de forma simultánea una litotricia extracorpórea por ondas de choque y una ureterorrenoscopia flexible para un mejor control de la fragmentación de la litiasis y aplicando láser holmium. En el postoperatorio inmediato se realizó una ecografía y una tomografía computarizada (TC) de control al mes.

Resultados: Se consiguió la completa fragmentación de todas las litiasis y se dejó un catéter doble J que se retiró posteriormente tras la comprobación de la ausencia de restos litiásicos mediante TC. No hubo complicaciones intraoperatorias, ni posquirúrgicas.

Conclusiones: Esta técnica descrita es novedosa, segura y reproducible. El buen resultado obtenido mediante esta técnica combinada aumenta nuestro interés en seguirla empleando y considerarla como una opción de tratamiento para las litiasis renales de nuestros pacientes.

Introduction

The development of the technique and the material of the ureterorenoscopy have enabled the approach of a greater number of lithiases and more complex.[1] Thanks to the appearance of semi-rigid and flexible endoscopes, we can access the kidney in a retrograde manner more easily.[2]

Retrograde intrarenal surgery (RIRS) allows for the treatment of renal lithiases including lower pole lithiases, calyceal diverticula, and in presence intrarenal anatomical alterations. Lithiases smaller than 2 cm are susceptible to be treated by means of this technique, and those larger than 2 cm when they are of low radiological density and the patient's anatomy is favorable.[3] As disadvantages, a longer duration of the procedure due to the smaller fragmentation capacity of fine laser fibers with the probability of leaving fragments and the need for multiple treatments stand out.[2,4]

Extracorporeal shock wave lithotripsy (ESWL) remains the primary treatment of most uncomplicated upper urinary tract stones.[2,5] It is considered a good option for renal lithiases of up to 2 cm intrarenal. However, it presents limitations as in the case of skeletal malformations or difficulty in the location with radioscopy of the stones. On the other hand, its success for lithiasis of the lower calyx will depend on the length of the calyx, the infundibulum, or the infundibulum-pelvic angle.[2]

Both separate procedures have a high lithiasis-free rate (LFR) and used in combination have shown promising results.[6,7] In order to overcome the limitations of both flexible ureterenoscopy (F-URS) and ESWL, the objective of this article is to present our initial experience in a treatment in which we combine both techniques.

Casuistry

A 54-year-old woman with a body mass index of 28 and a history of smoking and carotid atheromatosis were treated. She had bilateral, multiple, and recurrent renal lithiases, which were considered candidates for this technique due to failure of previous treatments and multi-calyceal stones. In the preoperative evaluation, a simple abdominal X-ray and a computed tomography (CT) of the abdomen without contrast were performed. The lithiases on the left side were treated (Fig. 1a), affecting all calyceal groups with a maximum diameter of 6 mm, without dilatation of the urinary tract and in the absence of ureteral or bladder lithiases. The intervention was completed under general anesthesia and with intravenous antibiotic prophylaxis using a 7.5 F flexible ureterorenoscope (Olympus, Tokyo, Japan) with holmium: YAG laser of 275 μm and ESWL (Dornier Gemini, Dornier MedTech, Wessling, Germany). The patient signed the informed consent and the study protocol was approved by the research ethics committee. At all times the rules of confidentiality and data protection were followed.

Surgical technique

The patient was placed in lithotomy position and she was prepared for the treatment of ESWL (Fig. 2). Subsequently, the flexible ureterorenoscope was ascended to the kidney on a 14 Fr ureteral sheath, using a continuous flow and a manual pump for the irrigation of the surgical field.

The lithiases were treated by ESWL (Table 1) and the resulting fragments were sprayed by F-URS and holmium laser. A maximum intensity of 8 MJ was applied, a total wave number of 2287 and a total energy of 120 J. The holmium laser fiber (270 μm) and the endoscopic basket were used