



ORIGINAL ARTICLE

Simultaneous bilateral percutaneous nephrolithotomy: Effectiveness and safety[☆]

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KEYWORDS

Nephrolithiasis;
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Abstract

Objectives: To evaluate the effectiveness and safety of simultaneous bilateral percutaneous nephrolithotomy performed in patients affected with bilateral renal calculi.

Materials and methods: This is a prospective study from September 2012 to November 2016. Patients diagnosed of bilateral kidney stones with abdominal CT scan were included. Surgical technique prone position, renal puncture guided by fluoroscopy and tract dilation up to 24Ch. We reviewed demographic and stone characteristics, stone free rate, clinical success, complications and follow-up.

Results: During the study period, 732 percutaneous nephrolithotomies were performed. Eighteen patients were included (36 renal units, 2.5%), 13 men and 5 women, with a median age of 58 years and an interquartile range (IQR) of 40–66. Median stone burden was 228 mm² (IQR 134–389); median operative time, 150 min (IQR 97–180); and median hospital stay, 5 days (IQR 5–15). Stone free rate was 80%. Residual calculi were encountered in 8 renal units (22.2%) and required other complementary techniques for their complete resolution 4 external shock-wave lithotripsies, one open ureterolithotomy, 2 ureteroscopies and one second look. Major complications included 4 cases of severe hemorrhage managed with angiographic embolization. The median follow-up was 36 months (range 26–46).

Conclusions: Simultaneous bilateral percutaneous nephrolithotomy is an effective and safe procedure in patients affected with bilateral renal calculi. It is a surgical challenge that should be performed in selected patients and in centers with experience.

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PALABRAS CLAVE

Litiasis renal;
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Nefrolitotomía percutánea bilateral simultánea: Eficacia y seguridad''**Resumen**

Objetivos: Evaluar la efectividad y seguridad de la nefrolitotomía percutánea bilateral simultánea realizada en pacientes afectados de litiasis renales bilaterales.

Material y métodos: Estudio prospectivo, período de septiembre de 2012 a noviembre de 2016. Se incluyeron pacientes diagnosticados de litiasis renales bilaterales por TC abdominal. Técnica quirúrgica posición en prono, punción renal guiada por fluoroscopia y dilatación del tracto hasta 24Ch. Se revisaron las características demográficas y de las litiasis, la tasa libre de litiasis, el éxito clínico, las complicaciones y el seguimiento.

Resultados: Durante el período de estudio, se realizaron 732 nefrolitotomías percutáneas. Dieciocho pacientes (36 unidades renales; 2,5%), 13 hombres y 5 mujeres con una mediana de edad de 58 años y un rango intercuartílico (RIC) de 40-66. Tamaño de la litiasis mediana de 228 mm² (RIC 134-389), tiempo operativo mediana de 150 min (RIC 97-180) y una estancia hospitalaria mediana de 5 días (RIC 5-15). La tasa libre de litiasis fue del 80%. Se reportaron litiasis residuales en 8 unidades renales (22,2%) que requirieron técnicas complementarias para su completa resolución, 4 litotricias extracorpóreas por ondas de choque, una ureterolitotomía por laparotomía, 2 ureteroscopias y un segundo procedimiento. Complicaciones mayores incluyeron 4 hemorragias manejadas mediante embolización por angiografía. Mediana de seguimiento 36 meses (rango 26-46).

Conclusiones: La nefrolitotomía percutánea bilateral simultánea es un procedimiento eficaz y seguro en pacientes afectados con cálculos renales bilaterales. Es un desafío quirúrgico que debe realizarse en pacientes seleccionados y en centros con experiencia.

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Introduction

Urolithiasis is a frequent and chronic disease with a high recurrence rate, close to 70% at 10 years. According to Sanchez-Martin et al.,¹ the incidence in Spain is 737/100,000 inhabitants per year (0.73%) and the prevalence is 5063/100,000 (5.06%). Its highest peak of incidence is between the fourth and fifth decade varies with gender, being 13% in men and 7% in women. The overall incidence of bilateral renal stones is not negligible, being reported to range from 12% in idiopathic or infected stone formers to 26% in patients with metabolic abnormalities. As a consequence, patients with bilateral renal stones may not be so infrequent as it was thought in the past and represent a cumbersome challenge to endourologists.^{2,3}

Percutaneous nephrolithotomy (PCNL) is the standard treatment for large (>2 cm) and/or complex kidney stones. The first PCNL was done by Fernstrom and Johansson in 1976, since which the technique has experienced many changes and improvements, minimizing both its morbidity and invasiveness, with a remarkable improvement in efficacy and operative time.²⁻⁶

Traditionally, patients with large or complex bilateral kidney stones were managed with separate successive unilateral PCNL. Recently, different authors have demonstrated favorable results with simultaneous bilateral percutaneous nephrolithotomy (SBPCNL), claiming that it is possible and safe to approach both kidneys simultaneously in a single surgical act, reducing the overall operating time, requiring only one anesthetic intervention, shortening overall hospital stay, and decreasing costs, while obtaining a good stone free rate (SFR).^{3,7,8}

The aim of our study was to evaluate the effectiveness and safety of SBPCNL in the treatment of bilateral kidney stones, describing step by step our surgical technique.

Materials and methods**Study design**

This is a prospective study that comprehends the period between September 2012 and November 2016, and took place in Bellvitge University Hospital, a tertiary referral center in Barcelona, Spain. The study was compliant with the Ethical principle of Declaration of Helsinki. During the study period, 732 PCNLs and 18 SBPCNLs (2.5%) were performed. Patients diagnosed with bilateral kidney stones with abdominal computed tomography (CT) were included (Fig. 1). Inclusion criteria included stones of 1 cm or larger, a low perioperative risk (ASA I-II), Hemoglobin >12 mg/dL, BMI <45, and absence of congenital anomalies or coagulopathies. Exclusion criteria comprised previous history of renal surgery or urosepsis, pediatric patients, complex caliceal anatomy, Glomerular filtration rate <30 mL/min/1.73 m² (Modification of Diet in Renal Disease (MDRD) Study equation), lack of data or follow-up, patients from other centers, and patient refusal.

Surgical procedure

Procedures were carried out by two skilled endourologists from our department who perform approximately 90 PCNLs

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