

# Severe Obesity, Spinal and Pelvic Deformities that Make Percutaneous Nephrolithotomy Operation Complicated: Case Study and Review of the Literature

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## Abstract

Percutaneous nephrolithotomy is a preferred surgical procedure for especially >2cm stones and also would be performed for 1-2cm stones. There are some individual factors that affect the success rate of operation such as obesity and deformities. 64 year-old female patient, admitted to our clinic with left flank pain and dysuria that was lasting for 1 month. The patient had a history of congenital hip dislocation. According to the results, left percutaneous nephrolithotomy operation was planned for the patient. The patient was stone-free after the operation and nephrostomy tube was removed postoperative 2nd day. As reported in our study, spinal, pelvic deformities and obesity make percutaneous nephrolithotomy more difficult and complicated but in experienced centers there are similar success and complication rates comparing with normal population.

**Keywords:** Deformity; Percutaneous; Nephrolithotomy; Obesity

## Introduction

Percutaneous nephrolithotomy is a preferred surgical procedure for especially >2cm stones and also would be performed for 1-2cm stones [1]. There are some individual factors that affect the success rate of operation. One of these factors is obesity [2]. Obese patients with renal stone are not suitable for extracorporeal shock wave lithotripsy because of skin-to-stone distance and open surgery is not routinely recommended because of increased risk of complications such as greater blood loss, greater loss of renal function, increased risk of injury to other organs, longer hospitalisation and longer convalescence. Percutaneous nephrolithotomy (PCNL) and retrograde intrarenal surgery are the preferred treatment options for these patients and Akbulut et al. showed the similar efficacy of mini-percutaneous nephrolithotomy between obese and non-obese patients [2]. Another factor that is affecting the success rate of percutaneous nephrolithotomy is spinal deformity, especially scoliosis. Spinal deformities may increase the risk of visceral injuries

during the renal puncture [3]. Wang et al. showed many advantages of ultrasonographic access such as shorter access time, reduced blood loss, lower operative complications and higher stone-free rate in their study [4]. Puncture of the kidney ipsilateral to the curvature is easier than the puncture of the contralateral kidney [5]. There are typically 2 curvatures, one towards the kidney and one away from it. When the convex part of the scoliosis is towards the ipsilateral kidney, the kidney is pushed laterally and this is making puncture easier.

The vice versa is true and when the concave part is towards the ipsilateral kidney, moving the kidney away from the skin and this is making puncture more difficult. Chen et al. reported the safety and efficacy of both mini-percutaneous nephrolithotomy and standard percutaneous nephrolithotomy. Li et al. also reported the efficacy of mini-PCNL for the treatment of stone disease in patients with scoliosis but according to this study ultrasonography is only reducing the procedural risk but not improving the success rate [5]. Pelvic deformities are also affecting positioning during PCNL. In this study we aimed to present a complicated urolithiasis case that has both spinal and pelvic deformities and also severe obesity.

## Case

64 year-old female patient, admitted to our clinic with left flank pain and dysuria that was lasting for 1 month. The patient had a history of congenital hip dislocation. Body mass index was 37.8kg/m<sup>2</sup>. According to the laboratory analysis; biochemical results were normal but urinalysis revealed infection and due to this condition, the patient was given oral antibiotic therapy. X-ray revealed semi-opac kidney stone and according to computerised tomography, there was a 18\*12mm kidney stone in left ureteropelvic junction and a 16mm-diameter stone in lower pole of left kidney (Figure 1& 2).



**Figure 1 & 2:** Computerised tomography – deformities and severe obesity.

On CT, stone to skin distance was 13.2cm. Also imaging methods revealed minimal scoliosis the patient. Cobb's angle was

14°. After 7 day of oral antibiotic therapy, the urinalysis and urine culture were normal. According to the results, left percutaneous nephrolithotomy operation was planned for the patient. Before the operation left ureteral stent was inserted but during this procedure it was very difficult to give lithotomy position to the patient because of the severe pelvic deformity. After the urethral catheter insertion, the patient was given prone position and also we had difficulty while giving the prone position because of scoliosis, pelvic deformity and severe obesity of the patient. Triangulation method was used for access and also fluoroscopy was preferred. Amplatz dilators were used for dilatation and the Access sheath size was 24Fr, 17cm. During the operation, blood loss was minimal, nearly a half unit. Total surgery time was 55 minutes and the access time was 15 minutes. The patient was stone-free after the operation and nephrostomy tube was removed postoperative 2nd day. The patient was discharged on postoperative 2nd day and was involved in routine follow-up program.

## Discussion

Percutaneous nephrolithotomy (PCNL) is an effective surgical treatment for especially >2cm stones. There are lots of factors affecting the success rate of the operation [6]. Surgical volume of the operating center, stone factors such as stone size, location, Hounsfield unit, patient factors such as age, associated deformities and obesity are the main factors that are affecting the success rates of PCNL [6]. There are also nephrolitometric scoring systems for predicting outcomes of PCNL [6]. Guy's stone score, Nephrolitometric nomogram, STONE nephrolitometry, Seoul renal stone complexity score are some of these scoring systems [6,7]. Obesity is an important factor for the success and complication rates. Dauw et al. reported a study with 1152 patients and according to this study there was no significant differences for complication rates between ideal, overweight and super-obese patients [8]. Spinal deformity is another risk factor that is affecting the success and the complication rate and there are several studies in the literature that are reporting the efficacy and safety of PCNL for the patients with spinal deformities. Izol et al. reported a study with 16 patients and the spinal deformities of the patients were kyphoscoliosis, post polio syndrome, osteogenesis imperfecta, myotonic dystrophy and ankylosing spondylitis [9]. El-Husseiny et al. reported that lateral decubitus position and regional anesthesia would improve clinical odds for high-risk patients that are performed percutaneous surgery [10]. Papatsoris et al. used Montreal mattress and Proneview protective helmet system in their study and they showed their preventive role for anesthetic and skeletal complications [11]. In this study, only minor complications were reported and PCNL was reported as safe and effective operation for these patients [9]. In another study by Kara et al. it was reported that PCNL would be used safely in patients with scoliosis, for larger and shock wave-refractory stones [12]. Ankylosing spondylitis is another spinal deformity type and it makes both anesthesia and operation more difficult [13]. Prone and

supine positions would be used for PCNL and there are several advantages and disadvantages for both positions [14]. Yuan et al. reported higher stone-free rates, shorter operative times and lower blood transfusion rates for supine position [15]. Mak et al. reported a review about patient positioning and according to this study, both positions had similar results for stone-free and complication rates [14]. As reported in our study, spinal, pelvic deformities and obesity make percutaneous nephrolithotomy more difficult and complicated but in experienced centers there are similar success and complication rates comparing with normal population.

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