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Dear Doctor,

Greetings from Micro Labs limited. We are happy to bring you "NU Rounds" which contains latest and interesting news in the field of Nephrology and Urology.

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Looking forward to your valuable feedback

Best Regards,

Medical Team, Micro Labs Ltd

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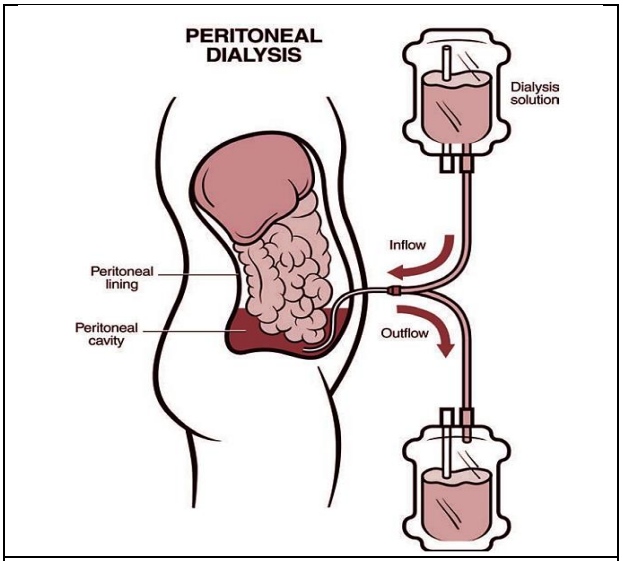
1. Investigation of the association between albumin to non-high-density lipoprotein cholesterol ratio and all-cause mortality in patients receiving peritoneal dialysis

Introduction: Malnutrition has been associated with an increased risk of mortality and is a major problem among peritoneal dialysis (PD) patients. Early studies in the United States revealed that 40–66% of PD patients were malnourished. Subsequent studies that used blood albumin levels to determine protein-energy loss found that PD patients were highly likely to be malnourished. Patients undergoing PD who had a baseline serum albumin level of less than 3.0 g/dL were at a greater risk of infection-related death by 3.4 times and of all-cause and cardiovascular mortality by more than three times adjusted. In patients with PD, malnourishment and inflammation have a substantial correlation with cardiovascular events and mortality. PD Patients have low serum albumin for a variety of reasons, such as protein loss, acidity, and psychosocial variables. According to recent study, inflammation may have a greater bearing on hypoalbuminemia than hunger, which was associated with poor patient outcomes.[1] Serum non-high-density lipoprotein cholesterol (non-HDL-C) was the difference between serum total cholesterol and HDL-C. It was responsible for all the cholesterol found in lipoprotein particles that have been traditionally considered proatherogenic, such as lipoprotein (a), low-density lipoprotein (LDL), and triglyceride-rich lipoproteins (i.e., chylomicrons, very low-density lipoprotein, and intermediate-density lipoprotein). Cholesterol has been considered the primary factor in non-HDLs that contributes significantly to atherogenicity. As a result, the connection between serum levels of these lipoproteins and poorer outcomes was driven by cholesterol content.[2] The relationship between the albumin to non-HDL-C ratio and mortality in PD patients has not been studied, despite the fact that both the albumin-to-cholesterol ratio and the non-HDL-C to HDL-C ratio have been used to predict the risk of cardiovascular disease in the general population. Serum albumin and non-HDL-C levels need to be taken into account in order to fully assess the prognosis of PD patients.[1] The purpose of this study was to determine the association between all-cause mortality and the albumin-to-non-HDL-C ratio in PD patients.



Peritoneal dialysis

Methods: A total of 1954 PD patients were included in this retrospective cohort analysis. Lab, comorbidity, and demographic information was made available to patients receiving PD at six different locations. The Kaplan-Meier curve was utilized to determine the correlation between all-cause mortality and the albumin to non-HDL-C ratio. Cox regression analysis was used to determine the independent predictive value after correcting for confounding variables. The impact of additional outcomes on the prediction of all-cause death was investigated using competitive risk analysis. All-cause mortality was the main endpoint, and the follow-up period

covered each of the following: death, transplant, transfer to another center, hemodialysis, and loss of follow-up. At the final assessment, patients who were lost to follow-up were censored.

Results: During the 33-month follow-up period, 538 deaths from all causes were reported. The Kaplan-Meier analysis results showed that there were substantial differences in all-cause death rates between the lowest and highest groups (log-rank = 36.03, p<0.001) as well as between the lowest and moderate categories (log-rank = 24.35, p<0.001). No significant difference was seen between the moderate and highest categories (log-rank = 1.128, p = 0.288) (Figure 1). After correcting for other variables such as complications, medication, age, sex, BMI, and biochemical examination, multivariate cox regression revealed that a decreased albumin to non-HDL-C ratio was an independent risk factor for all-cause death in patients undergoing PD. In comparison to the lowest group (≤9.36), both the middle group (9.36–12.79) and the highest group (>12.79) had a considerably lower risk of all-cause mortality. A competitive risk analysis showed no statistical significance for other competing events, but substantial differences were seen for all-cause mortality (p < 0.001).

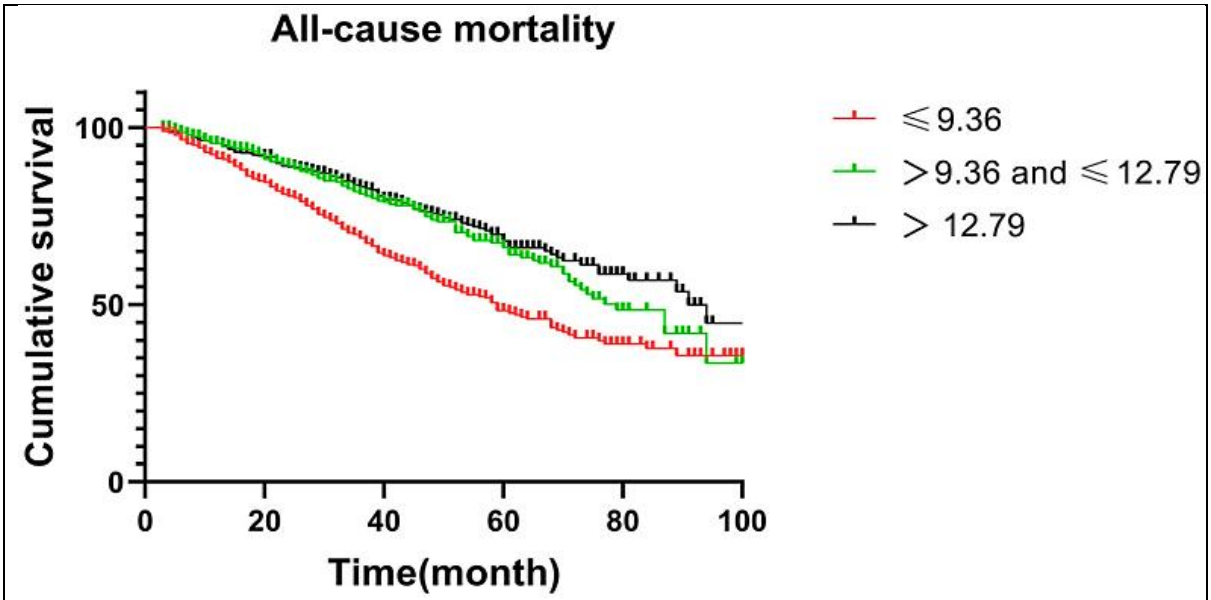


Figure 1: The Kaplan-Meier curves for all-cause mortality, separated further by albumin to non-HDL-C ratio level. The Mantel-Cox log-rank test was used to compare the curves after they were created using the Kaplan-Meier method.

Discussion: After controlling for comorbidities, medication, age, sex, BMI, and biochemical testing, this study found that a reduced albumin to non-HDL-C ratio was an independent risk factor for all-cause death in PD patients.[1] According to a study by Yu J. and colleagues, PD patients' deaths were significantly predicted by increased non-HDL-C (>173.75 mmol/L) as an independent predictor (95% CI, 1.12–1.39; p < 0.001).[3] Comparable markers, such as the ratio of TG to HDL-C and non-HDL-C to HDL-C, can detect high-risk carotid plaque early on; 1.94 and 2.86 were the ideal cut-off values, respectively.[4]

Conclusion: The current study suggested that in PD patients, a low albumin-to-non-HDL-C ratio is associated with a greater risk of all-cause mortality. For PD patients, it could be a useful prognostic biomarker.

Patients with a greater baseline albumin-to-non-high-density lipoprotein cholesterol (non-HDL-C) ratio had a lower mortality risk than those with a moderate or lower ratio, despite being younger and having a lower prevalence of comorbidities.

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2. Evaluation of urinary kidney injury molecule 1 (uKIM 1) and urinary neutrophil gelatinase-associated lipocalin (uNGAL) as indicators of active lupus nephritis

Introduction: Systemic lupus erythematosus (SLE) is a complicated autoimmune disease with numerous clinical symptoms. Lupus nephritis (LN) is one of the most prevalent and severe symptoms of SLE, causing significant morbidity and mortality among patients. The prognosis for LN patients is still not adequate, especially in certain ethnic groups like African Americans and Hispanics, even with improvements in overall SLE patient treatment and 5- and 10-year renal survival rates. In order to improve the prognosis of LN, newer approaches that are more specific and sensitive to the beginning or recurrence of renal disease activity must be developed. This will enable the early implementation of therapy programs. Early diagnosis was crucial since a higher frequency of renal insufficiency and end-stage renal disease (ESRD) was associated with the late detection of LN.[1] In order to diagnose lupus nephritis (LN) and assess the severity of the condition's chronicity, renal histopathology remains the gold standard. A number of long-studied serological and urine indicators have been linked to various histological manifestations of lupus nephritis. High levels of neutrophil gelatinase-associated lipocalin (NGAL) have been observed following renal injury (ischemic or toxic) in animal models, cardiovascular surgery, intensive care units, nephropathy following renal transplantation, nephrotoxicity caused by cisplatin, and chronic kidney disease (CKD). Few studies, particularly those involving individuals who already have a renal illness, have examined urine NGAL (uNGAL) as a potential predictor of LN activity. Studies conducted on patients with lead toxicity in particular have shown that Urinary Kidney Injury Molecule-1 (uKIM-1) was a sensitive and specific marker of tubular injury. None of the urine biomarkers for lupus nephritis has been shown to accurately indicate the disease's activity, response to therapy, or prognosis, despite a large body of studies on the condition.[2] So, the purpose of this study was to evaluate urine biomarkers in lupus nephritis and investigate their potential correlation with renal damage.

Methods: A prospective cohort study includes forty patients diagnosed with systemic lupus erythematosus (SLE) who were split into two groups: (1) the lupus nephritis group, consisting of patients with biopsy-proven proliferative lupus nephritis (classes III and IV) who did not receive immunosuppressive drugs (glucocorticoids excluded) within the previous three months; and (2) the lupus non-nephritis group, which included SLE patients without any renal manifestation. During enrollment, a thorough medical history was taken, and a comprehensive physical examination was performed on every participant. The SLE disease activity index (SLEDAI) was used to assess the degree of disease activity. Therefore, a patient's score was divided into four categories: inactivity (if it was less than 4), mild disease activity (if it was between 4 and 8), moderate disease activity (if it was between 9 and 12), and severe disease activity (if it was greater than 12). Scores ranged from 0 at the minimum to 105 at the maximum. During the kidney biopsy and six months following the induction therapy, measurements of uNGAL, uKim-1, uNGAL to urinary creatinine excretion (mg/dl), and uKim-1 to urinary creatinine excretion were made in random spot urine samples.

Results: The active LN group had a considerably higher mean SLEDAI score (18.5) before therapy compared to the non-nephritis group (7.5). In comparison to the other two groups, the active LN group had a considerably higher serum creatinine level. However, there was no statistically significant difference between the lupus group without nephritis and the control group. Compared to the other two groups, the lupus-non-nephritis group had noticeably fewer platelets and white blood cells. Prior to therapy, there were greater levels of uNGAL and uKIM-1 in the LN group (P-value < 0.001). The ROC study revealed that uNGAL had a 95% sensitivity, 100% specificity, and an AUC = 0.996 for diagnosing LN at a level of > 59. (Figure 1) However, the uKIM-1 ROC revealed that it had 85% sensitivity, 80% specificity, and an AUC of 0.919 at a level of > 1.6. Following therapy, there was a significant decrease in uNGAL and uKIM levels (P-value < 0.001). Urinary indicators and other clinical, inflammatory, and serological markers of lupus nephritis did not significantly correlate before or after treatment. Furthermore, uNGAL and uKIM-1 levels were greatly reduced following treatment.

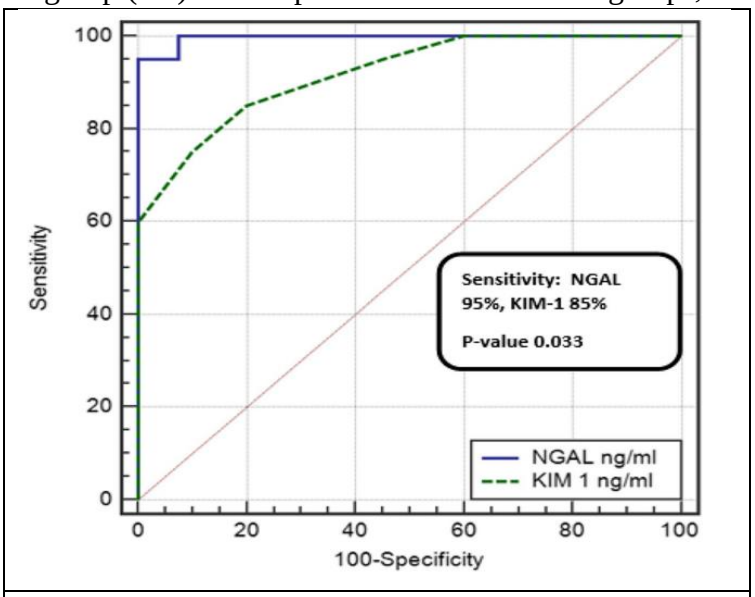

Figure 1: A pairwise comparison of the ROC curves for uNGAL and uKIM-1 as lupus nephritis predictors.

Discussion: Kidney disease activity was measured using the renal SLE Disease Activity Index (rSLEDAI). Haematuria, pyuria, proteinuria, and urine casts were the four kidney-related parameters that make up the score. The current investigation found no significant connection between uNGAL and the uNGAL/creatinine ratio or either serological or pathological activity indicators of LN.[2] According to a study by Khadijah et al., there was a substantial positive link between the rSLEDAI score, the total SLEDAI, the uProt/uCreat ratio, and uKIM-1 and anti-dsDNA. The relationship between uKIM-1 and serum C3 levels was substantial, but the relationship between uKIM-1 and serum C4 levels was not significant.[3]

Conclusion: The current study concluded that there was a significant reduction in urinary biomarkers after therapy, with the exception of serum creatinine, which showed no variation before and after treatment. The lupus nephritis disease activity can be predicted and marked by uNGAL, uKIM, the uNGAL/Creat ratio, and the uKIM/Creat ratio.

Urinary kidney injury molecule 1 (uKIM 1) and urinary neutrophil gelatinase-associated lipocalin (uNGAL) were reliable indicators of changes in lupus nephritis activity.

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3. Evaluation of postoperative urosepsis incidence and risk factors in ureteroscopic lithotripsy patients

Introduction: Urinary stone disease is still the most frequent urological condition, despite being recognized for decades. The mechanics, risk factors, and epidemiology of stone formation are currently extensively established. Geographical, climatic, ethnic, nutritional, and genetic factors all contribute to the etiology. Furthermore, a number of conditions, like obesity, diabetes mellitus, or hyperparathyroidism, influence the incidence of urolithiasis. Globally, the incidence of urolithiasis is still rising sharply, despite the abundance of research done in this area and the extensive understanding of the condition. Epidemiological studies indicate that the frequency in adults was 1–20%, with potentially higher rates of up to 25% in underdeveloped nations. Based on their location, stones in the urinary system may be categorized.[1] In recent years, ureteroscopic lithotripsy (URSL) has advanced significantly because of advancements in endoscopic technique and medical device upgrades. Nowadays, the most popular urological procedure is ureteroscopy (URS), which can be used for a number of diagnostic and therapeutic purposes, including the detection and management of ureteral strictures, vascular malformations, hematuria, urinary stones, and urologic neoplasms.[2] The early application of appropriate treatment would be made possible by identifying people at a high risk of urosepsis by identifying the predictors of infection following URSL.[1] So, this study was carried out to determine the incidence and predictors of urosepsis following URSL.

Methods: This retrospective analysis comprised 231 individuals who had undergone URSL with a holmium laser. Prior to URSL, all patients had non-contrast-enhanced computed tomography (CT) and abdominal ultrasonography to determine whether hydronephrosis and stone burden were present. Potential urosepsis predictors, such as patient features and specific clinical variables, were investigated, along with the incidence of urosepsis during the 30-day post-treatment period. A confirmed or suspected urinary tract infection coexisting with a rise in the sequential [Sepsis-related] Organ Failure Assessment (SOFA) score of two points or higher was considered organ dysfunction.

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Results: A verified positive urine culture was obtained before the surgery in 16.88% of the patients, according to statistical analysis. (Figure 1) Escherichia coli was the most often found pathogen in the population with urosepsis. In contrast, three of the eleven patients had a multidrug-resistant (MDR) infection. All patients had a diagnosis of urosepsis within two days following surgery. Urosepsis occurred after the surgery in 4.76% of patients. The probability of postoperative urosepsis was found to be strongly correlated with three parameters, according to univariable analysis: the presence of an MDR pathogen detected before surgery, preoperative positive urine culture, and double-J stent insertion before URSL. Only a positive urine culture continued to be substantially correlated with the risk of urosepsis following URSL in multivariable analysis.

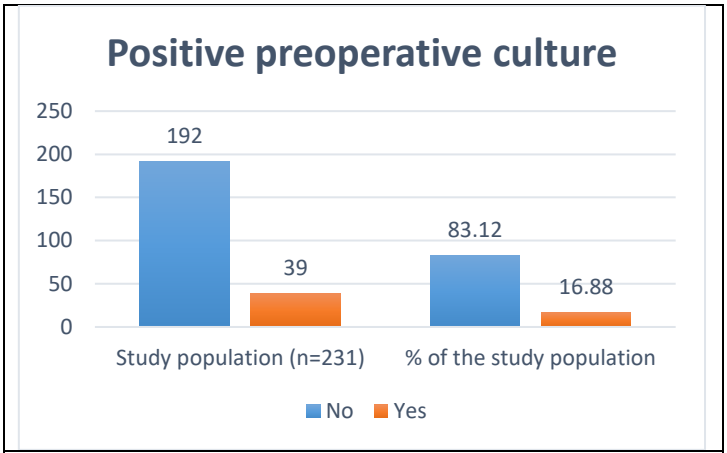

Figure 1: A positive urine culture prior to the operation

Discussion: Multivariable analysis in this study revealed that the risk of urosepsis following URSL was only substantially correlated with a positive urine culture.[1] In Bai T et al., a multivariate analysis showed that the probability of postoperative urosepsis was considerably elevated by both a positive preoperative MDR urine culture and a lengthy operation.[2] The study by Amier Y et al. found that preoperative urine leukocytes, stones in adjacent calices on the coronal plane, the maximum cross-sectional area of stones, urine nitrite, the diameter of hydronephrosis, and the total number of stones were linked to postoperative urosepsis following mini-percutaneous nephrolithotomy (mPCNL) in patients with large kidney stones. Additionally, multivariate logistic regression analysis revealed that preoperative urine leukocytes of ≥450/µL were the only independent risk factor for postoperative urosepsis.[3]

Conclusion: The current study concluded that the individuals who had a positive urine culture prior to URSL had a markedly increased risk of postoperative urosepsis. As a result, urine cultures should be performed on a regular basis prior to scheduled endoscopic urolithiasis treatment.

Every patient should have a urine culture obtained before any scheduled endoscopic therapy for urolithiasis.

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4. A case report of laparoscopy-assisted ultrasound-guided percutaneous nephrolithotomy for the management of kidney stones in pelvic ectopic kidney

Introduction: Ectopic kidneys are a type of congenital kidney anomaly that includes pelvic, thoracic, and cross-ectopic kidneys, with pelvic ectopic kidneys being the most prevalent.[1] A rare developmental defect, the incidence of an ectopic kidney was suggested to be 1:12,000 in clinical cases and 1:900 in postmortem cases. The position of the ectopic kidney may be thoracic, abdominal, iliac, or pelvic. It can be unilateral or crossing-fused, also known as crossed renal ectopia. Patients with an ectopic pelvic kidney are more susceptible to reflux, hydronephrosis, nephrolithiasis, and even renal failure than those whose kidneys are normally shaped because of the irregular and aberrant rotation of the pelvic kidney.[2] High ureter insertion, the renal vasculature, or both may partially predispose them to urine drainage obstruction, resulting in urinary tract infection, hydronephrosis, and kidney stones because of the aberrant location and malrotation of the pelvic ectopic kidney.[1]

The present case described a stone in the pelvic ectopic kidney that was treated by laparoscopy-assisted ultrasound-guided percutaneous nephrolithotomy (PCNL).

Case presentation: A 39-year-old male patient was admitted to the hospital for complaints of abdominal pain for half a month. His abdominal pain was centered in the left lower quadrant. In addition, he reported having a history of passing stones when urinating. The patient had a history of pelvic ectopic kidney disease for two years, as well as extracorporeal shock wave lithotripsy for ureteral stones. The patient had 96 μmol/L of creatinine and 439 μmol/L of uric acid. A regular blood examination revealed normal levels of neutrophils, hemoglobin, red blood cells, and white blood cells. The results of the urinalysis revealed a positive urine blood test (1+), a red blood count of 17.3/μL, and a bacteria level of 148.3/μL. A pelvic ectopic left kidney was discovered on an abdominal computed tomography (CT) scan, and stones were seen at the lower calyces of the kidney (Figure 1).

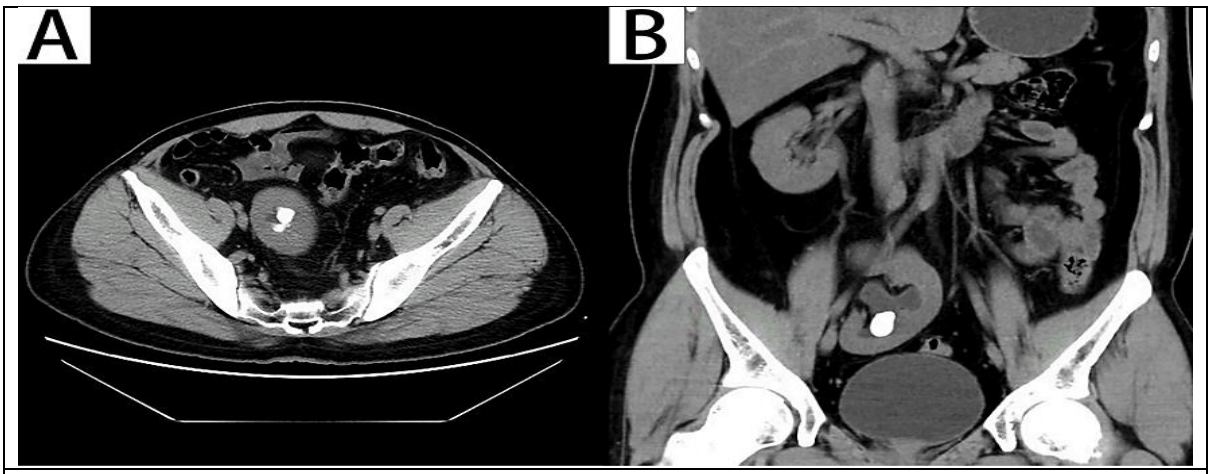

Figure 1: The patient's abdominal CT scan revealed stones in the pelvic ectopic left kidney. A: Axial scanning reveals stones in the ectopic left kidney in the pelvic cavity; B: coronal scanning reveals stones in the pelvic ectopic kidney's lower calyces.

The patient's pelvic ectopic left kidney stones were treated with laparoscopy-assisted ultrasound-guiding PCNL for the following procedure. Before inserting an 18Fr urinary catheter, a 5Fr ureteral catheter was retrogradely put into the left kidney's renal pelvis in the lithotomy position while the patient was under general anesthesia. The 6.5Fr needle-perc was used to guide the percutaneous renal access after it was driven deeply into the abdomen with an ultrasound probe, and the overlapping intestines were moved aside while the patient was in a supine split-leg position. A laparoscope was added to prevent injury to the intestines from direct viewing after the trocar was inserted from the incision made in the upper edge of the umbilical skin and the pneumoperitoneum was created. Once the patient was in the head-down, tilted position, the bowel loops moved out, and the pelvic ectopic kidney, pierced with a needle, was displayed. The working sheath was then positioned under laparoscopic observation after the percutaneous tract had been dilated to standard 24Fr using a high-pressure balloon dilator. Following the insertion of a 14Fr nephrostomy tube and a 14Fr abdominal drainage tube, a 6Fr antegrade double-J stent was finally implanted.

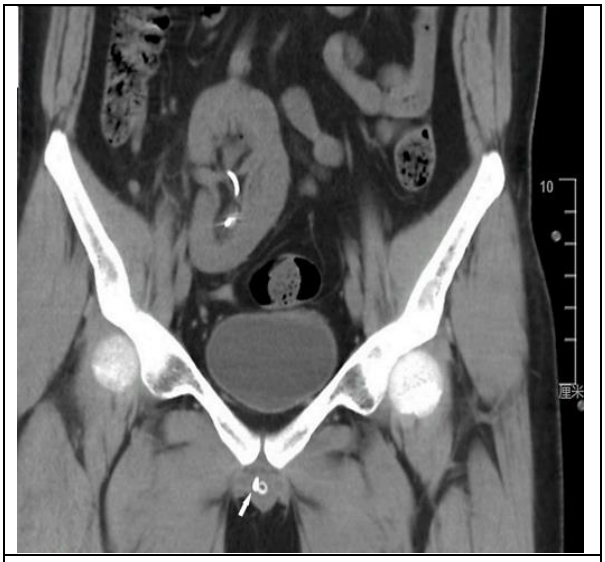

Figure 2: The distal end of double-J stent moved into posterior urethra as revealed by postoperative coronary CT scanning (white arrow)

Two days after surgery, the patient's levels of white blood cells, neutrophils, interleukin-6, and C-reaction protein were slightly higher but otherwise normal. A plain film obtained after surgery showed that the patient was stone free. Before the nephrostomy tube was cut seven days after surgery, the drainage of the abdominal drainage tube, nephrostomy tube, and urine catheter were all clear. However, the patient reported persistent urination along with stomach discomfort. After unclipping the nephrostomy tube, a CT scan revealed that the distal end of the double-J stent had become lodged in the posterior urethra (Figure 2). The double-J stent placement was then corrected for the patient via a cystoscopy. Prior to the patient's discharge, the urine catheter, abdominal drainage tube, and nephrostomy tube were all removed.

Discussion: Laparoscopy-assisted PCNL was not only feasible, it was a safe, minimally invasive procedure for patients with ectopic kidneys presenting with large stones.[2] Laparoscopy assisted percutaneous nephrolithotomy surgery was a safe and effective option for the treatment of pelvic ectopic kidney stones, and has several alternative approaches.[3]

Conclusion: Laparoscopy-assisted ultrasound-guided percutaneous nephrolithotomy (PCNL) was a safe therapeutic option for stones in the pelvic ectopic kidney with a high stone-free clearance.

Laparoscopy-assisted PCNL was both safe and effective in treating ectopic pelvic kidney stones. It facilitates the removal of stones with the least amount of morbidity.

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