

Percutaneous nephrolithotomy in a patient with cervical and dorsolumbar ankylosing spondylitis

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ABSTRACT

Ankylosing spondylitis is a form of arthritis that typically develops in the lower back and hips and gradually progresses up toward the neck over time. Ankylosing spondylitis results in spinal deformities in the long-term. These cervical deformities make intubation difficult for the anesthetists and similarly cause difficulty in positioning the patient for percutaneous nephrolithotomy (PCNL) to the urologist. We report the case of a 61-year-old male who presented to us with bilateral urolithiasis. Physical examination revealed him to be having cervical kyphosis and dorsolumbar scoliosis. The anesthetic team performed nasal intubation with the patient in half-sitting position using a video laryngoscope. PCNL was performed with the patient lying prone and the chest and abdomen supported by pillows from beneath. Post-operative recovery was uneventful.

Key words: Ankylosing spondylitis, Kidney, Percutaneous nephrolithotomy, Renal calculi, Spinal deformity

Ankylosing spondylitis is a form of arthritis that usually causes flares of burning pain in the spine. It typically develops in the lower back and hips, but gradually progresses up toward the neck over time. The pain in the neck region appears to be the first symptom with cervical ankylosing spondylitis. It is a troubling symptom, as it typically appears when the disease has become more advanced. Ankylosing spondylitis does result in spinal deformities in the long-term. Treatment of renal stones in such patients with cervical spinal deformity raises a serious problem both for the anesthetists and treating urologists. The cervical deformities caused by ankylosing spondylitis makes intubation difficult and similarly causes difficulty in positioning the patient for percutaneous nephrolithotomy (PCNL) [1].


CASE REPORT

A 61-year-old male patient presented to the urological services of the hospital with a chief complaint of the right flank pain, dull aching in nature for 4 months. The patient was a known case of hypertension for 6 years and was on regular medications. There was no significant history.

General examination revealed that the patient was afebrile with a pulse rate of 90 bpm, blood pressure of 110/70 mmHg, respiratory rate of 16/min, and SPO₂ of 98% on room air. The patient had serious cervical kyphosis and dorsolumbar scoliosis (Fig. 1a-d).

Serum creatinine was 6.14 mg% and blood urea nitrogen was 171 mg% at presentation. Plain computed tomography of the kidney, ureter, and bladder region showed right-sided gross hydronephrosis with thinning of renal parenchyma secondary to a staghorn calculus measuring 2.4 cm×2.0 cm and left-sided moderate to gross hydronephrosis with thinning of renal parenchyma secondary to a renal pelvic calculus 3.1 cm×1.6 cm (Fig. 2a and b). Apart from these stones, there were multiple small stones bilaterally. Pulmonary function tests were suggestive of a severe restrictive pattern.

Since the renal parameters were raised, the patient underwent the insertion of double J stents bilaterally. The serum creatinine dropped down to 3.14 mg%. The patient underwent right PCNL 1 month later as he was symptomatic on the right side. In view of the cervical spondylitis, the anesthetic team performed nasal intubation with the patient in half-sitting position using a video laryngoscope. Under fluoroscopic guidance and the patient in half-sitting lithotomy position, a 6 Fr ureteral catheter was introduced

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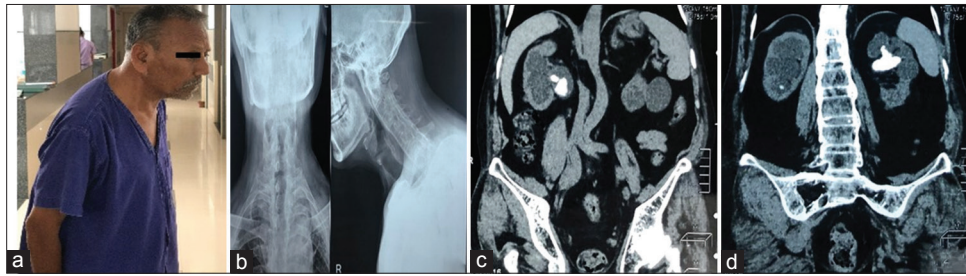


Figure 1: (a) Elderly patient with severe cervical kyphosis and dorsolumbar scoliosis; (b) X-ray cervical spine AP/lateral showing severe cervical kyphosis with bamboo spine; (c) plain computed tomography (CT) kidney, ureter, and bladder (KUB) showing the right renal calculi; and (d) plain CT KUB showing the left renal calculi



Figure 2: (a) Patient placed in half-sitting supine lithotomy position; (b) The patient in modified prone position

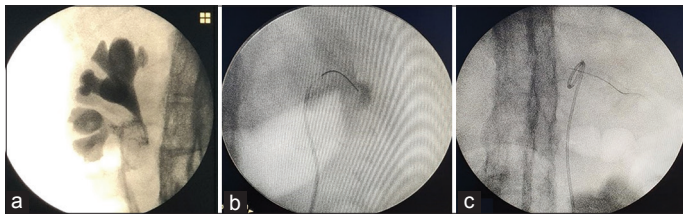


Figure 3: (a) Right retrograde pyelography showing pelvicalyceal anatomy with filling defect due to renal calculi; (b) fluoroscopic image showing left renal calculi; (c) post-operative fluoroscopic image showing stone clearance with DJ stent *in situ*

in the right ureter and retrograde ureteropyelography was done and the pelvicalyceal system studied (Fig. 3a-c). The ureteric catheter was left in place. The patient was positioned prone, with the chest and abdomen supported by pillows from beneath.

Renal access was gained using the triangulation technique. The tract was dilated up to 30 Fr. An Amplatz sheath was placed and using a 28 Fr nephroscope, the calculi were fragmented and stone pieces extracted. At the end of the procedure, a 6 Fr double J ureteric stent and a 16 Fr nephrostomy tube were placed. The procedure and the post-operative period were uneventful.

Then, the left side PCNL was done 6 weeks later and the same procedure was carried out on the opposite side. The post-operative period was uneventful. The patient was discharged on the 4th post-operative day. Bilateral double J stents were removed 15 days later. The patient was on a regular follow-up to us and the nephrologist since then and nadir serum creatinine was 2.1 mg/dl.

DISCUSSION

Ankylosing spondylitis is classified as autoimmune spondyloarthropathy disorder, which affects joints and adjacent structures, including the vertebra, sacroiliac joints, hip, and shoulder resulting in the fusion of the spine [2]. The fusion

of vertebra leads to the classical appearance called “bamboo spine” [3]. The loss of flexibility of the neck and vertebra poses a serious problem for these patients and is a matter of concern for the anesthetists for intubation, as well as to the urologist for positioning whenever PCNL needs to be performed.

Pulmonary involvement is a known extra-articular effect of ankylosing spondylitis and it may occur as restrictive pulmonary dysfunction [4,5]. Moreover, the involvement of costochondral and costocervical joints limits chest expansion and might lead to aggravation of ventilation problems [4,6].

Awake intubation using fiber optic bronchoscopy is preferred for such patients. We modified the classical prone position by placing pillows below the chest and abdomen so as to raise the same and put the patient at ease during the procedure. Jindal *et al.* [7], too, reported on a similar approach.

Urolithiasis being a common problem, the patients with spinal and skeletal deformities are likely to present with renal stones. It is also indicated that the incidence of stone disease is higher in patients with ankylosing spondylitis [8]. The European Association of Urology guidelines recommend endourology (PCNL or retrograde intrarenal surgery [RIRS]) procedure as the first step in the treatment of large renal pelvic stones >20 mm, lower pole stones 10–20 mm in size in the presence of unfavorable factors for shock wave lithotripsy (SWL), and failed cases of SWL [9]. However, in a patient with large staghorn calculus, RIRS is not recommended.

Supine PCNL is also favorable in some patients with spinal deformities; however, it requires expertise. No standard treatment is available, which can be recommended for patients with spinal deformity. Our case showed that the PCNL method for staghorn calculus is applicable for the patients with advanced kyphoscoliosis that developed secondary to ankylosing spondylitis.

CONCLUSION

PCNL is a safe, effective, and reliable procedure that can be recommended in patients with spinal deformities, even in patients with cervical ankylosing spondylitis.

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