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# THE ROLE OF THE CLEARPETRA SUCTION ACCESS SHEATH AND UROFINO DISPOSABLE URETEROSCOPE AS AN ALTERNATIVE TO PCNL/CONVENTIONAL FLEXIBLE URETEROSCOPY FOR A LARGE RENAL PELVIS STONE: A CASE REPORT AND A REVIEW OF THE LITERATURE

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## INTRODUCTION

Over the last decade, there have been vast advancements in endourology, with innovation leading to large renal stones being successfully treated with minimal to no incisions.

As the elderly population is growing, we are seeing a trend of more complicated stone patients who are not suitable candidates for percutaneous nephrolithotomy (PCNL) and would require several attempts with conventional flexible ureteroscopy.

We aim to share our experience using the ClearPetra Suction Access Sheath and UROFINO Disposable Ureteroscope to completely fragment a large renal stone in a frail elderly patient in a single sitting.

## CASE REPORT

A 71-year-old gentleman with significant comorbidities and on anticoagulants was admitted with a high temperature, loin pain, and raised inflammatory markers. Non-contrast computed tomography of the urinary (CT KUB) showed an obstructing 3.5 cm renal pelvis stone (Figure 1).

He was treated for an infected obstructed kidney with intravenous antibiotics, and a percutaneous nephrostomy was inserted. This was later internalised to an antegrade stent once he had improved clinically, and he was later discharged with a clamped nephrostomy (Figure 2).

He was assessed and deemed high risk and not an ideal candidate for PCNL due to his comorbidities and being on anticoagulation. Therefore, the decision was made to treat the stone with flexible ureteroscopy and laser fragmentation using a suction ureteric access sheath.

The UROFINO 7.5 Fr single-use ureteroscope was used through a 11/13 Fr ClearPetra Ureteric Access Sheath inserted just below the pelvi-ureteric junction. The stone was fragmented using holmium laser with a 200-micron fiber (Figure 3AB).

Stone dusting at 0.4J 15Hz, the dust and stone fragments produced were extracted via the ClearPetra ureteric access sheath, intermittently removing the ureteroscope and allowing the larger stone to pass through the sheath. Stone clearance was confirmed visually and radiologically, achieved within 60 minutes of intraoperative time (Figure 4).

A 6 French 26-centimeter ureteric stent on a string was inserted at the end of the procedure. The patient was brought back for a second look ureteroscopy 6 weeks later, confirming no fragments left from the previous procedure. This experience has changed our practice, as we no longer perform second look ureteroscopy if stone clearance has been visually and radiologically proven (Figure 5).

An added benefit of using a suction access sheath is the large number of stone fragments that could be sent for biochemical analysis. In this case, the stone

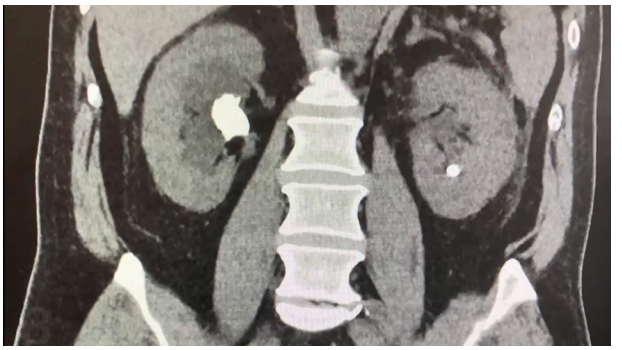


**FIGURE 1** CT KUB showing an obstructing 3.5 cm right renal pelvis stone.

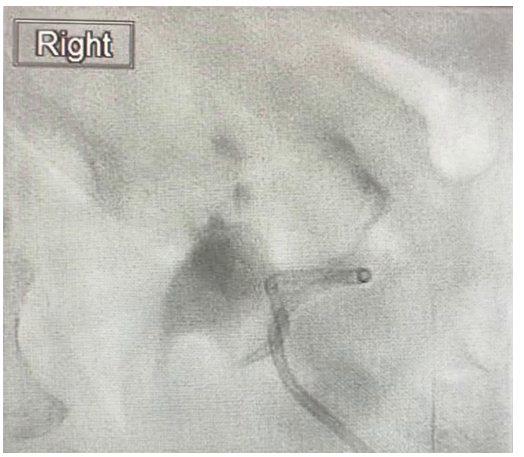



**FIGURE 2** X-ray on the table confirming placement of right nephrostomy, with the large renal pelvis stone clearly visible.

was found to be calcium oxalate and the patient was counseled on his diet and lifestyle to prevent similar stones from forming in the future.

## LITERATURE REVIEW

A literature search was conducted in November 2022 using the following search terms "ClearPetra", "ClearPetra Ureteral Access Sheath", "UROFINO single-use Uretroscope", "Ureteroscopy", "ClearPetra Ureteral Access Sheath." Papers reporting the use of ClearPetra in percutaneous nephrolithotomy were excluded.

There are 3 published papers that reported the use of the ClearPetra Ureteral access sheath (Figure 6). Ecer et al.[1] concluded that its use reduces kidney damage during ureterorenoscopy, Zeng et al.[2]


**FIGURE 3** (A) X-ray showing guidewire in the upper pole with the ureteroscope at the renal pelvis. (B) UROFINO 7.5 Fr single-use ureteroscope.

concluded that its use has diminished stone retropulsion, improved stone clearance, improved visual field, and probably reduced the intraluminal pressure. Ostergar et al.[3] concluded that vacuum-assisted ureteric access sheath (V-UAS) during RIRS can lower mean intrarenal pressure. However, this effect could reverse with extended suctioning, especially under conditions of high vacuum (>200 mmHg) due

**FIGURE 4** Large stone visible in the renal pelvis before laser fragmentation.

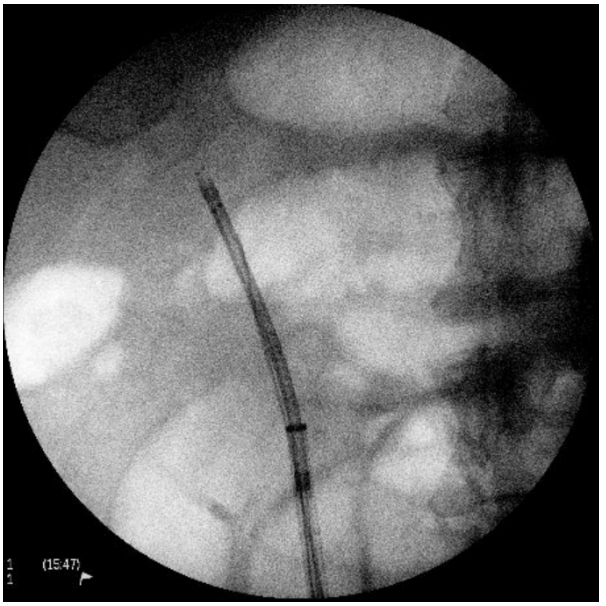
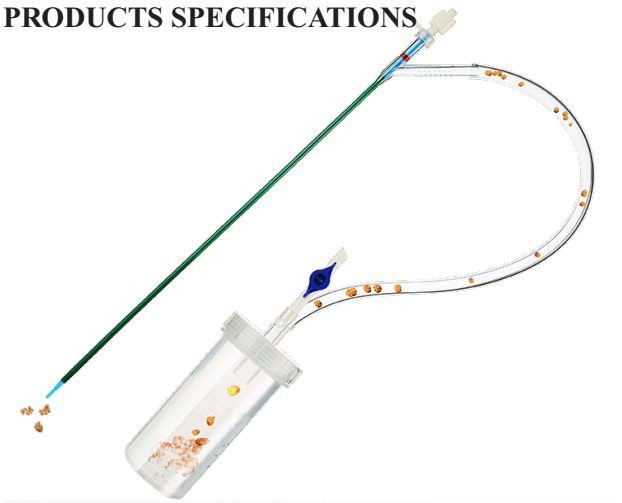


**FIGURE 5** Complete clearance with no residual fragments on second look ureteroscopy.

to outflow tract collapse; their results suggest urologists should use lower suction settings and short, less than five-second bursts to maximize therapeutic benefit and minimize potential shortcomings of V-UAS during RIRS.

**PRODUCTS SPECIFICATIONS**



*ClearPetra Ureteral Access Sheath*

| Cat. No. | ID/OD×Length | Cat. No. | ID/OD×Length | Cat. No. | ID/OD×Length |
|---|---|---|---|---|---|
| 90111013 | 10/12Fr × 13cm | 90111146 | 11/13Fr × 46cm | 90111336 | 13/15Fr × 36cm |
| 90111026 | 10/12Fr × 26cm | 90111155 | 11/13Fr × 55cm | 90111340 | 13/15Fr × 40cm |
| 90111036 | 10/12Fr × 36cm | 90111213 | 12/14Fr × 13cm | 90111346 | 13/15Fr × 46cm |
| 90111040 | 10/12Fr × 40cm | 90111226 | 12/14Fr × 26cm | 90111355 | 13/15Fr × 55cm |
| 90111046 | 10/12Fr × 46cm | 90111236 | 12/14Fr × 36cm | 90111413 | 14/16Fr × 13cm |
| 90111055 | 10/12Fr × 55cm | 90111240 | 12/14Fr × 40cm | 90111426 | 14/16Fr × 26cm |
| 90111113 | 11/13Fr × 13cm | 90111246 | 12/14Fr × 46cm | 90111436 | 14/16Fr × 36cm |
| 90111126 | 11/13Fr × 26cm | 90111255 | 12/14Fr × 55cm | 90111440 | 14/16Fr × 40cm |
| 90111136 | 11/13Fr × 36cm | 90111313 | 13/15Fr × 13cm | 90111446 | 14/16Fr × 46cm |
| 90111140 | 11/13Fr × 40cm | 90111326 | 13/15Fr × 26cm | 90111455 | 14/16Fr× 55cm |

**FIGURE 6** ClearPetra Ureteral Access Sheath with collection bottle.

## DISCUSSION

This case highlighted several advantages of using the ClearPetra Suction Access Sheath and the UROFINO Disposable Ureteroscope as an alternative to conventional Flexible Ureteroscopy or PCNL.

It allowed the procedure to be carried out with reduced intraluminal pressure, which lowers the risk of calcyeal injury, infection, and sepsis. Similarly, removing dust and smaller stone fragments improved our visual field and reduced the risk of causing damage to renal parenchyma and calyceal injury.

The improved views allowed fragmentation to be more controlled and made it more difficult for retropulsion or stone migration, which prevents unnecessary further procedures that increase the risk of harm and are costly. As a result, the improved fragmentation efficacy will likely increase the chances of patients becoming stone-free and shorten their intra-operative time and hospital stay.

This procedure does not replace the role of PCNL in treating difficult larger renal stones; however, it can certainly be used as an alternative in

patients unsuitable for PCNL or in centers that do not have an established PCNL service. It, however, may hold a greater advantage over standard ureteroscopy and other access sheaths due to its suction capabilities.

## CONCLUSION

This ClearPetra Suction Access Sheath and the UROFINO Disposable Ureteroscope have several advantages over conventional Flexible Ureteroscopy or PCNL, and we have shown that it can be used safely even in patients that are high risk.

Larger studies comparing its use with flexible ureteroscopy and PCNL could potentially lead to more defined information to aid decision-making and patient selection in those with larger renal stones or deemed high-risk patients.

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