ALLIUM STENT IN EXTENSIVE URETERAL STENOSIS: LESSON LEARNED FROM ITS FIRST OFF LABEL USED IN INDONESIA

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ABSTRACT

Objective: *This study aims to determine the use of allium stents for ureteral stenosis.* ***Case(s) Presentation:*** *This study reported a case of 50-year-old-male with right ureteral stenosis that underwent allium installation, the first ever used in Indonesia.* ***Discussion:*** *A 50-year-old male with a history of retroperitoneal soft tissue sarcoma and prior radiotherapy presented with right hydronephrosis and hydroureter, experiencing severe irritative symptoms after DJ stent placement. Following an unsuccessful initial attempt, a second Allium stent installation using a 26-fr delivery system with radiologist support was successful, significantly improving his quality of life and reducing symptoms. Long-term ureteral stenting is commonly used when major surgery is not an option for patients. Metallic stents offer an alternative method to address the blockage in a single procedure, without the risk of issues like tissue erosion, infection, or tube encrustation. The design of the Allium stent ensures that the ureter remains open by providing direct support to the walls, resulting in better dilation compared to the double-J stent. In this study, the patient who received an Allium stent could benefit from its use. The stent has shown effectiveness in treating ureteral stenosis, relieving bothersome urinary symptoms, and reducing the need for frequent visits to the operating room for JJ stent replacement.* ***Conclusion:*** *Allium stents improve quality of life in patients with irritative symptoms from JJ stents, reducing Re-operations of JJ insertion, and hospital stay.*

Keywords:*Ureteral stenosis, allium stent, Indonesia.*

ABSTRAK

Tujuan:*Penelitian ini bertujuan untuk mengetahui penggunaan stent allium pada stenosis ureter.* ***Presentasi Kasus:*** *Penelitian ini melaporkan kasus seorang pria berusia 50 tahun dengan stenosis ureter kanan yang menjalani pemasangan stent allium, yang merupakan pertama kali digunakan di Indonesia.* ***Diskusi:*** *Seorang pria berusia 50 tahun dengan riwayat sarkoma jaringan lunak retroperitoneal dan terapi radiasi sebelumnya mengalami hidronefrosis dan hidroureter kanan, dengan gejala iritatif yang parah setelah pemasangan DJ stent. Setelah upaya awal yang tidak berhasil, pemasangan Allium stent kedua menggunakan sistem pengiriman 26-fr dengan dukungan radiologis berhasil, secara signifikan meningkatkan kualitas hidupnya dan mengurangi gejala. Penggunaan stent ureter jangka panjang umumnya digunakan ketika operasi besar bukanlah pilihan bagi pasien. Stent metalik memberikan metode alternatif untuk mengatasi penyumbatan dalam satu prosedur dan tanpa risiko seperti erosi jaringan, infeksi, atau pengerasan tabung. Desain stent Allium memastikan bahwa ureter tetap terbuka dengan memberikan topangan langsung pada dinding, sehingga menghasilkan pelebaran yang lebih baik dibandingkan dengan stent JJ. Dalam penelitian ini, pasien yang menggunakan stent Allium dapat memperoleh manfaat dari penggunaannya. Stent tersebut telah menunjukkan manfaat dalam mengobati stenosis ureter, meredakan gejala iritasi pada saluran kemih, dan mengurangi kunjungan berulang keruang operasi untuk penggantian stent JJ.* ***Simpulan:*** *Stent Allium meningkatkan kualitas hidup pada pasien dengan gejala iritasi yang ditimbulkan penggunaan stent JJ, mengurangi re-operasi pemasangan JJ, dan masa perawatan di rumah sakit.*

Kata kunci:*Stenosis ureter, stent Allium, Indonesia.*

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INTRODUCTION

Many aetiologies, internally or externally, could lead to ureteral stenosis.[1] Double J stent insertion is one way to treat ureteral stenosis but has several drawbacks, such as intolerance, infection, encrustation, and blockage.[1] To solve these, metallic stents have been developed, with promising results

compared to conventional stents.[2-3] Metallic stent was created to stop early encrustation and tissue ingrowth into the lumen. Their double-pigtail design could lessen unpleasant side effects. Allium ureteral stent (Allium Medical Solutions Ltd, Caesarea, Israel), a self-expanding stent comprised of a nitinol skeleton and a polymeric cover,is coated with a polymer that prevents surrounding tissue from growing into the stent and makes it impermeable to fluids. This stent has demonstrated good efficacy in treating benign conditions such as strictures following radiotherapy, ureteroenteric anastomotic strictures after urinary diversion, or strictures post-ureteroscopy.

Furthermore, its fluid-sealing properties have led to numerous reports of successful treatments for ureteral injuries, ureteral fistulas, and urinomas. The Allium stent is used internationally, with significant usage in Europe, North America, and Asia for treating ureteral strictures. Clinical studies show an average indwelling time of 14.29 months, with a notable complication rate involving stent occlusion and the need for further interventions in some cases.[3] This case report presents a lesson learned from first ever Allium stent use in Indonesia.

CASE(S) PRESENTATION

A 50-year-old male came to ED with right flank pain. Medical history revealed retroperitoneal soft tissue sarcoma with completed radiotherapy over the past two years. CT scan identifies right hydronephrosis and hydroureter. DJ stent was placed, but he had severe irritative symptoms and dysuria persist after 2 months. The patient worked in the medical field, actively searched for his condition, and requested a placement of an Allium stent. The stent is unavailable in Indonesia, so it had to be imported.

The patient underwent two times Allium stent installations. The first Allium stent installation wasn't successful due to a lack of experience and unfamiliarity with the properties of allium stents. The first attempt failed due to the small size of the distal tip of the cystoscope sheath (20 Fr). This led to difficulty in releasing the stent and susceptibility off applying too much pressure thus resulting an incorrect placement (more proximal than target).

The second installation was carried out 2 weeks later by placing a stent more distal consequently covering all parts of the stenosis than the first stent. This time we use a 26-fr delivery system neprhoscope, with a radiologist standing by concurring the position and actively giving feedback during fluoroscopy. Duration of operation was 45 minutes and the procedure went well.

The patient's quality of life is better after the procedure. the irritative symptoms and pain in flank area is reduced progressively. Abdominal radiography showed the Allium stent was correctly position, with stent on stent placement showing no signs of problem.

DISCUSSION

Radiation therapy (RT), external beam radiation therapy (EBRT), brachytherapy (BT), photon beam therapy (PBT), high intensity focused ultrasound (HIFU), and cryotherapy are noninvasive treatment options in treating pelvic malignancies. These treatments are effective but several studies have shown that it can cause genitourinary complications early after treatment or even years after.[4] Early complications of radiation therapy consist of lower urinary tract symptoms (LUTS) such as frequency, urgency, and dysuria. Long-term complication can manifest as hesitancy, retention, stricture, and hematuria.[5]

Long-term ureteral stenting is typically used in patients who are contraindicated for major surgery. The duration of stenting is determined by the indications. Polymer stents should be replaced every three months. Metallic stents are less prone to encrustation and can be changed once every 12 months.[6]

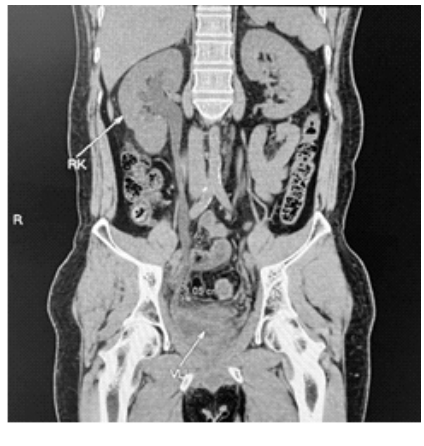

Figure 1. Grade 1 hydronephrosis and hydroureter of right ureter on CT scan.

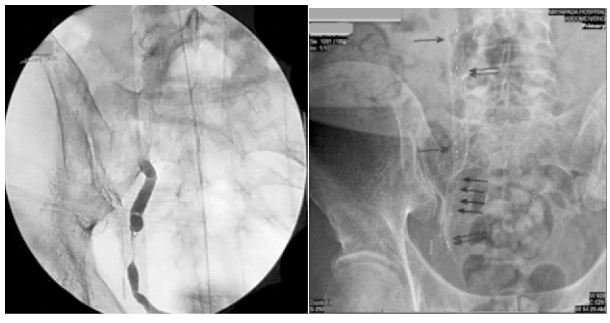

Figure 2. Intraoperative fluoroscopy showing the ureteral stenosis (Left), Post operative abdominal radiography showing the correct placement of the Allium URS (Right).

Metallic stents represent an alternative technique to solve the obstruction in a single procedure without experiencing adverse side effects like tissue erosion, infection, or tube encrustation. The design ensures lumen patency by direct wall support, so dilatation with the Allium stent is much better than with double-J stent.[2,7]

Allium stent formed of nitinol with copolymer coating, implanted under general anesthesia, and inserted endoscopically under fluoroscopic guidance. Allium stents are not prone to crusting, even though this process is much slower. An accelerated crusting model performed on every Allium stent reveals 80% surface coverage at 6 weeks, with little effect on the stent lumen and no luminal blockage. This allows Allium stent to be implanted for longer to three years period. Quality of life is bettered due to fewer re-operations and hospitalizations.[7-8] Literature indicates that Allium stent are safe and effective but not devoid of side effects.

Figure 3. The Allium stent.Used for ureteral stricturesand includes an anchor (stents intended for use in midureter do not have an anchor). Picture courtesy of Allium Medical.[7]

Mosmomkovitz et al. observing migration in seven (14.2%) patients and blockage in one stent.[9] Irritative symptoms with allium stent is less likely to develop because the stent design does not protrude into the bladder like DJ stent.[10]

Lessons learned from the first time used in Indonesia was, when using a scope sheet, it is recommended to use a larger size, which in this case with 26 Fr sheath, to avoid difficulties in installation, as was the issue with the first stent placement using a 20 Fr cystoscope sheath. Secondly, C-arm position should be fixed so its mobility is limited before insertion and allium stent position must visible on monitor before the stent is placed. Third, stenting accompanied by a radiologist can help to ensure the position and actively giving feedback during fluoroscopy. Allium stents are 10 cm long, but there are no studies regarding the best use of allium stents regarding the stenosis length and in certain cases such as multiple stenoses. Therefore, research on allium stents uses in the future is needed as evidence-based practice, especially in Indonesia. In this case study, a patient who could benefit from such a device is shown to be treated for ureteral stenosis, the irritative urinary symptoms are resolved, and many trips to the operating room to replace the double-J are avoided.

CONCLUSION

The use of allium stents can improve the quality of life of patients who predominantly complain of irritative symptoms with DJ stents, and their use can significantly reduce the number of Re-operations of JJ insertion and hospital stay when compared to DJ stents especially for long term use such in oncological cases. Insertion of allium stents requires understanding of allium stent mechanics, and possibly experience from other urologist to give a feedback and share the possible drawbacks during insertion since we have only oneshot during placement. Some of the tips presented in this paper are expected to help urology colleagues in Indonesia and abroad.

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