

Stent-ception: implementation of soft double-J stents in the ureteric Memokath-051™ in bilateral ureteric stricture post radiotherapy for advanced prostate cancer

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Narrowing of ureter can be due to malignant or benign causes. Temporary double-J (DJ) stents, various metallic stent designs, or definitive corrective surgery can be the options management for ureteric stricture. As an alternative from DJ stents, Memokath-051™ (MMK-051™) can be inserted in strictured ureters post radiotherapy for advanced prostate cancer patients. We present a case of an advanced prostate cancer which bilateral DJ Stents placed within MMK-051™. A 76-year-old man with underlying hormone sensitive advanced prostate cancer completed radiotherapy. Post radiotherapy he developed bilateral ureteric strictures and bilateral DJ stents inserted. He had to underwent multiple change of stents due to blockage. Patient had MMK-051™ inserted, however complicated with blockage due to encrustation. Improvisation method done by putting the bilateral DJ stents within the MMK-051™. Patient had no more blockage of MMK-051™ after the placement of DJ stents within it. However, patient succumbed to death a year after the last procedure. Our case report highlighted encrustation of metallic ureteric stents and a novel approach to overcome this problem. Introduction of additional DJ stents not only reduced the incidence of MMK-051™ blockage but also improved the quality of life of the patient.

Keywords: stent, prostate cancer, ureteric, stricture, metallic stent

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Стент на стенте: установка двойных мягких J-образных стентов в мочеточниковый стент Memokath-051™ при двусторонней стриктуре мочеточника после лучевой терапии распространенного рака предстательной железы

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Причинами сужения мочеточника могут быть как злокачественные новообразования, так и доброкачественные процессы. Для лечения стриктуры мочеточника применяют временные двойные J-образные стенты, металлические стенты различных дизайнов, реконструктивные операции. В качестве альтернативы двойным J-образным стентам после лучевой терапии у пациентов с распространенным раком предстательной железы при сужении мочеточника устанавливают стент Memokath-051™ (MMK-051™). Мы представляем клинический случай распространенного рака предстательной железы, при котором двусторонние двойные J-образные стенты были установлены внутри стента MMK-051™.

Мужчине 76 лет с распространенным гормоночувствительным раком предстательной железы проведен курс лучевой терапии, после которого развились двусторонние стриктуры мочеточника. Пациенту были установлены двусторонние двойные J-образные стенты. Он перенес многочисленные замены стентов по причине блокады. Пациенту был установлен стент ММК-051™, однако у него развилось осложнение в форме блокады в результате инкрустации. В стент ММК-051™ были установлены двойные J-образные стенты, после чего пациент перестал испытывать блокаду. Однако пациент скончался от рака предстательной железы через год после операции. В данном описании клинического случая мы подчеркиваем важность инкрустации металлических мочеточниковых стентов и предлагаем подход к решению этой проблемы. Установка дополнительных двойных J-образных стентов не только снизила частоту блокады стента ММК-051™, но и улучшила качество жизни пациента.

Ключевые слова: стент, рак предстательной железы, мочеточник, стриктура, металлический стент

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Background

Approximately 37 % of newly diagnosed localised prostate carcinoma among men are subjected for definitive radiotherapy (XRT) [1]. The severity of urinary adverse events as low as 0.1 % and are very rare post XRT [2]. Ureteric stricture is categorized as uncommon high-grade adverse effect as study showed only 2.7 % in men treated with radical prostatectomy and external beam radiotherapy compared to 1.2 % in controls with a 10 years propensity weighted cumulative [3]. The options of management including temporary DJ stents that may relieve ureteric obstruction but will worsen the quality of life and also requiring six monthly exchanges [4]. The placement of Memokath-051™ (MMK-051™) can be used as alternative to the DJ stents. The MMK-051™ is made from a shape-memory alloy of titanium and nickel. The alloy can change into two forms depending on the temperature (austenite and martensite) [5]. In our case report, we have done improvisation by putting the bilateral DJ stents within the MMK-051™ to avoid blockage due to encrustation.

Case report

A 76-year-old man presented with painless haematuria for two months, intermittent dribbling and poor stream. He also complained constitutional symptoms for past one month. He had underlying non oliguric chronic kidney disease stage V not requiring haemodialysis (HD). The prostate was enlarged and few hard nodules felt on surface based on digital rectal examination. The prostate specific antigen was elevated up to 146.50 ng/mL. He underwent transrectal ultrasound scan biopsy and multi-parametric magnetic resonance image (mpMRI) of the prostate. The Histopathological Examination (HPE) result came back as prostatic adenocarcinoma, high grade likely Gleason Score 10 (5 + 5) with mixed small cell type. The mpMRI reported as multifocal carcinoma of prostate with extension into the seminal vesicles, retro vesicle fat and wall of the urinary bladder (T3B stage).

Patient was started on hormonal therapy and the case was referred to oncology team for radiotherapy. He completed the radiotherapy sessions and 5 years after that the renal function was deteriorated. Patient developed end stage renal failure that required HD. Serial investigations were done and latest imaging showed patient developed bilateral ureteric stricture post radiotherapy. Initially, bilateral DJ ureteric stents were inserted, however due to frequent change of stents and encrustation, bilateral MMK-051™ stents were placed in. After 2 years of MMK-051™ stents insertion, serial renal functions deteriorated again despite on regular HD. The blockage of MMK-051™ stents was suspected. Flexible cystoscopy examination was done and there was encrustation on bilateral MMK-051™ stents (Fig. 1). The old MMK-051™ stents were replaced with the new one. The improvisation was done by inserting the DJ stents within the MMK-051™ stents (Fig. 2).

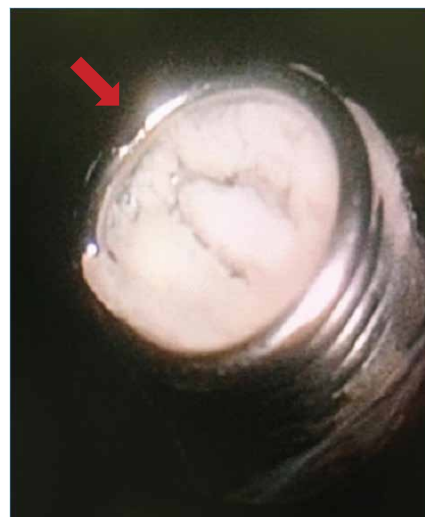


Fig. 1. Red arrow shown the total encrustation of the left distal MMK-051™ stent during flexible cystoscopy examination



Fig. 2. Yellow arrows shown bilateral DJ stents within the bilateral MMK-051™ stents. Kidney, Ureter, and Bladder (KUB) X-ray was shoot post procedure

The renal profile was improving and patient only required change of DJ stents every one year after improvisation. The quality of life was improved by this technique however patient succumbed to his illness last year due to HD-related complications.

Discussion

Most of the previous cases reported either DJ stents or MMK-051™ stents insertion as the management for ureteric stricture. No previous studies have been conducted for the bilateral DJ stents within the MMK-051™ to reduce the risk of blockage due to encrustation. This is considered as the first case report that has been published. More studies need to be conducted as the literatures are sparse to evaluate the relation of combination of the stents inserted with the outcomes.

As in common practice, DJ stents are used for conservative management of benign and malignant ureteric stricture especially in unfit and high-risk patients to undergo major reconstructive surgery. However, the DJ stents associated with multiple potential complications and three to six monthly changes [6]. Initially, DJ stents inserted for our patient to relieve ureteric stricture. However due to frequent routine exchange and also multiple emergency exchange of DJ stents due to blockage secondary to encrustation, his quality of life has been affected. Therefore, MMK-051™ stents have been introduced to reduce the adverse effects of DJ stents, without the need for frequent exchange.

After MMK-051™ stents were inserted to the patient, the quality of life improved tremendously. The MMK-051™ stent's patients have fewer lower urinary tract and stent symptoms, with improved general health scores and life quality compared their DJ stent counterparts [7]. The other

advantage, stents were thermo-expandable, which eased the insertion and removal in most patients. In addition, the stents helped with the ureteric peristalsis proximal to the stent, as the stents did not cover the whole ureter length [8]. However, during follow up, serial renal functions deteriorated again despite on regular HD. We suspected that the stents were obstructed. Almost a quarter of patients developed encrustation, especially when the stents were placed in distal ureteric strictures involving the ureteric orifices which were in contact with the bladder urine [9].

Hence, we embarked with flexible cystoscopy examination and there was encrustation on bilateral stents. The old stents were replaced with new ones. The improvisation was done by inserting the DJ stents within the MMK-051™ stents. The renal functions were improving and patient only subjected to yearly DJ stents exchange. The MMK-051™ remained not obstructed as the combination with DJ stents avoided the encrustation taking place.

In our case, the malignancy may predispose to stent encrustation, possibly due to urinary stasis induced by multiple factors such as dehydration secondary to poor fluid intake, multiple serial stents and recurrent or persistent urinary tract infection [10]. We hypothesized that the installation of traditional DJ stents prevented the encrustation of the MMK-051™ stents as the DJ stents reduced the urinary stasis due to improvement of urine flow rate.

The replacement time of DJ stents increased dramatically as surveillance flexible cystoscopy examination did not show any signs of encrustation or blockage of the stents in this patient. In our local practice, the DJ stents will be exchanged on yearly basis. Early replacement of DJ stents will be considered if there are any evidences of encrustation or blockage appeared in some cases. The temporal risk of encrustation is clear though there is still no consensus on ideal schedule for stents replacement. In general, most patients should have their ureteral stents removed sooner rather than later, although doing so frequently can raise their risk of retrograde infection and add to their financial burden [11].

The patient succumbed to his illness due to HD-related complications. In view of the clear cause of death, post-mortem was not commenced. Hence, there is no visual evidence to describe the lumen and inner surface of MMK-051™ after the death of the patient.

Conclusion

Exchange or removal of the stents may be required due to associated complications. The improvisation of combination between DJ stents and MMK-051™ stents have been proven to improve quality of life in patient with advanced prostate carcinoma. The literatures regarding combination of these stents are still sparse and more studies should be conducted to prove the efficiency of this novel technique.

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