



ORIGINAL ARTICLE / *Interventional imaging*

Tandem ureteral stents in the management of double-J stent dysfunction in gynecological malignancies

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KEYWORDS

Malignant ureteral obstruction;
Urinary diversion;
Ureteral stenting;
Interventional radiology;
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Abstract

Purpose: The goal of this study was to determine the efficacy and safety of tandem ureteral stent placement in the management of malignant ureteral obstruction (MUO) refractory to single ureteral double-J stent drainage in women with gynecological malignancies.

Materials and methods: A retrospective study was performed on 14 women (mean age, 54.5 ± 9.6 [SD] years; range: 38–70 years) who had tandem stent placement following failed single ureteral double-J stent placement from 2012 to 2017. Survival analyses were performed with Kaplan-Meier method.

Results: Twenty-nine successful procedures were performed on 19 ureters (19 primary stent placement and 9 exchange procedures). Technical success of primary tandem stent placement was 95% (19/20 procedures). Mean follow-up was 180.1 ± 173.7 (SD) days (range: 62–616 days). Median estimated survival of the patients was 118 days (Q1: 261, Q3: 95; range: 62–616 days). Primary stent failure rate was 25% and assisted stent failure rate was 21.4%. There was no significant difference among survival of patients with and without tandem stent failure. Mean estimated primary stent patency and assisted stent patency were 171.4 ± 13.8 (SD) days and 409.9 ± 59.8 (SD) days, respectively. Four patients underwent 1 to 3 stent exchanges. Median exchange time was 181 days (Q1: 151, Q3: 191, range: 141–214 days) and technical success rate was 100%. Grade 2 and 3 complication rates were 25% and 3.6%, respectively.

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Conclusion: Tandem ureteral stent placement is a feasible, safe and effective procedure for the management of failed ureteral double-J stent placement in women with gynecological malignancies.

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Malignant ureteral obstruction (MUO) is a commonly encountered problem in late-stage gynecologic malignancies. Prompt management is necessary for prevention or treatment of renal dysfunction and infection secondary to prolonged obstruction [1]. Surgical reconstruction is the definitive but not the favored treatment of MUO. Short life expectancy and high mortality risk of surgical procedures have placed demand for less invasive management options [1–3]. Urinary diversion, either external drainage with percutaneous nephrostomy (PCN) or internal drainage with ureteral stents are the current options in the management [1,4].

Although there is no evidence regarding the superiority of PCN over ureteral polymeric double-J stent (DJS), DJS placement is the current treatment of choice [1,4]. Ureteral stent placement is believed to be superior in terms of infection control, catheter dislodgement and patient comfort [1–5]. The issue with the single DJS is that some patients may experience DJS malfunction. In these patients, single DJS either cannot provide urinary flow primarily and hydronephrosis do not regress or owing to the progression of MUO, stent exchanges cannot overcome the malfunction. These primary failure rates range between 16% and 58% [2,6,7]. Metallic stents, metal-mesh stents or tandem DJS (simultaneous placement of two DJS through an occluded ureter) are current alternatives to maintain internal drainage following DJS malfunction [1,2]. There is currently a lack of consensus regarding which of these methods should be preferred after DJS failure because evidence on comparison of metal stents and tandem stents is limited [2].

Despite tandem DJS placement being an older procedure than metal stent placement, most studies focused on metal stents [2]. There is little published experience on the use of tandem stents since its first introduction in 1998 [2,3,6,8–11].

The goal of this study was to determine the efficacy and safety of tandem ureteral stents in the management of MUO refractory to single DJS drainage in women with gynecological malignancies.

Materials and methods

Patients

A retrospective review of the interventional radiology archive database and hospital records was performed to identify ureteral stent placements from 2012 to 2017. Informed consents regarding stent placement procedures

and approval to use the data in clinical investigations were obtained from all patients after discussing the alternative treatment options, advantages and disadvantages of the procedure. All procedures were performed in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Women with gynecologic malignancies who were managed with tandem stent placement subsequent to single DJS malfunction were included in the study group. Patients primarily treated with tandem ureteral stents were excluded.

Within the study period, primary DJS placement was found to be performed on 321 ureters in 204 patients. Among failures, 19 ureters were managed with tandem DJS, 67 were treated with percutaneous nephrostomy, 7 with DJS within a bare metal stent and 4 with bare metal stents. At the end point of the study, there were 53 ureters (36 patients) lost to follow-up, 41 ureters with a functioning single DJS and 130 ureters in deceased patients. Seventy-one DJSs were exchanged for 1–4 times for routine exchange.

The final study population included 14 women with a mean age of 54.5 ± 9.6 (SD) years (range: 38–70 years) who a total of 28 tandem stent placement procedures performed on 19 ureters.

Technique

All tandem stent placements were performed at the interventional radiology unit on an outpatient basis, unless the patients were hospitalized for any other gynecological reason. Patients were managed with tandem stents after a consensus of caring physicians and patients. Lack of availability of ureteral metal stents required tandem stent placement in all cases. Intravenous sedation with midazolam and fentanyl citrate was preferred for pain control in all patients. Antibiotic prophylaxis with 1000 mg ceftriaxone was routinely given to all patients.

Transurethral retrograde approach was used in patients with a dysfunctional open end DJS. The dysfunctional DJS was grabbed with a loop snare in the bladder (Amplatz Goose Neck[®], ev3 Inc., Plymouth, MN, USA) and the tip was pulled out from the urethra (Fig. 1). Attention was paid not to drop the distal end of the stent below the level of obstruction. After introducing a 0.035-inch stiff guidewire (Amplatz[®] Super Stiff; Boston Scientific, Natick, MA, USA) to the pelvis through the dysfunctional stent, the stent was withdrawn and a 6-French 45 cm sheath (Super Arrow-Flex[®], Arrow Int., Reading, PA, USA) was advanced over the wire. A

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