Complications of Long Term Indwelling Double J Stent and Their Management: A Single Centre Experience

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Abstract: Double J (DJ) stents “a foreign body” mostly a temporary measure for splintage of ureter. We know very well anything foreign to our body when stays beyond it purpose causes problem to treating doctor and patient. In the context of urology DJ stents are one of the most common foreign bodies. This study aims to analyze different complications and management of double J stents with indwelling time more than 6 months in a tertiary care hospital. In this prospective observational study we had included 23 patients who were operated elsewhere for any indication with DJ stent between August 2015 to June 2017. All cases were studied for their age, gender, duration of stent, presentation and surgical procedure performed. Among 23 patients, 15 were male and 8 were females. Total 11 patients (47.8%) presented with encrustation, 6(26.1%) with recurrent urinary tract infection, 3(13%) with stent migration. Regarding management 8 patient needed cystoscopic removal of stent, 5 patients were managed by ureteroscopic removal. Multiple procedures were required in 6 patients in which 3 needed extracorporeal shock wave lithotripsy (ESWL) followed by cystoscopic removal. Although DJ stent is an essential tool for urological armamentarium but its judicial use needed. As a surgeon’s prospective, management of forgotten DJ stents is important due to its medico-legal implications. Proper patient and their relatives counseling is of paramount importance.

Keywords: double j stents, forgotten, jj stents, complication

INTRODUCTION

Ureteral stents play an essential role in various endourologic and open surgical procedures. They have become the fundamental tool in today’s urological armamentarium and are employed for a number of indications including relief of upper urinary tract obstruction, ureteral injury and various urinary reconstructive procedures. Extensive uses and multiple indications in urology, DJ stents are prone for complications like fragmentation, stone encrustation, recurrent urinary tract infection and loss of renal function [1, 2]. Zimskind in 1967 was the first to describe endoscopic stent placement to relieve ureteral obstruction[3]. Ureteric stents are foreign bodies hence they should be removed as soon as their purpose solves, if forgotten they can lead to significant morbidity or even mortality too. Complications of stents are time dependent therefore it is advisable to remove or replace the DJ stent within 6 weeks to 6 month [1, 4, 5]. Forgotten Double J stent can be managed by either single or combination of procedures like cystolithotripsy, percutaneous nephro-lithotomy, ESWL, and ureteroscopic removal and in last but not the least by open surgeries [6, 7].

MATERIAL AND METHODS

In our study period from August 2015 to June 2017 we enrolled 23 patients of long term indwelling DJ stents. Prospectively we analyze the patient who were more than 12 years of age, presented with an indwelling double j stents of duration more than 6 months and operated elsewhere. Patients who were <12 years age and having silicon DJ stent were excluded from study. Patients were evaluated by thorough clinical examination with blood test. Radiological evaluation was done by X ray kidney ureter bladder

(KUB), ultrasonography (USG) KUB, intravenous urogram (IVU) or computed tomography (CT) KUB with urography and diethylene triamine penta acetic acid (DTPA) renogram whenever required. Analysis was done by MS excel.

RESULTS

Among 23 patients who were enrolled in our study, 15(65.2%) patients were male and 8(34.7%) were females. Their mean age was 40.3±13.4 years (range 14-67 years). Mean duration of DJ stent was 30±43.72 months (range 6-168 months). Mean serum creatinine of these 23 patients was 1.24±0.38 (range 0.7-2.1). Out of 23 patient 11 (47.8%) were presented with encrustation which was the most common presentation in our study (figure- 1). Other complications were migration (fig-2), stent fracture, recurrent urinary tract infection (UTI) etc. Table 1 is depicting various complications associated with long term DJ stents. Most of the patients were managed by single procedure (17)73.9% alone. Multiple procedures needed in 6 (26.1%) patients for removal of stent. Eight (34.7%) patients were managed by cystoscopic removal alone. Five patients 21.7% required ureteroscopic removal. One of our patients shown in figure 3 was managed by open extraction of fragmented encrusted lower end of double J stent followed by ureteroscopic removal. Table 2 is showing different management strategy applied in our study. One patient subsequently needed nephrectomy due to poor function. Following removal of these DJ stents 13 patients required restenting which were removed within 6 to 8 weeks on follow up.

Fig-1: A 13 month old forgotten Double J stent showing encrustation at its lower end
Fig-2: An encrusted and migrated double J stent

Fig-3: Encrusted and fragmented double J stent. The fragment present in bladder removed by open cystolithotomy while ureteral fragments were removed by endoscopic method
Table 1: Complications of prolong double j stenting in our study

<table>
<thead>
<tr>
<th>Complication</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encrustation</td>
<td>11</td>
<td>47.8</td>
</tr>
<tr>
<td>Fragmentation</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Fragmentation with calcul</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Migration</td>
<td>3</td>
<td>13.0</td>
</tr>
<tr>
<td>Pyonephrosis</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>Recuti</td>
<td>6</td>
<td>26.1</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2: Procedures done for forgotten double J stents n=23

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystoscopic stent removal</td>
<td>8</td>
<td>34.7</td>
</tr>
<tr>
<td>Ureteroscopic removal</td>
<td>5</td>
<td>21.7</td>
</tr>
<tr>
<td>PCNL</td>
<td>4</td>
<td>17.3</td>
</tr>
<tr>
<td>URS + PCNL</td>
<td>1</td>
<td>4.3</td>
</tr>
<tr>
<td>URS + open cystolithotripsy</td>
<td>2</td>
<td>8.6</td>
</tr>
<tr>
<td>ESWL followed by cystoscopic removal</td>
<td>3</td>
<td>13.0</td>
</tr>
</tbody>
</table>

DISCUSSION

Currently, double-J stents are commonly used in the treatment of different urinary diseases. Most of the times it is an uncomplicated procedure. However, the incidence of complications increases with the duration that the stent is in-vivo [5]. The common early complications encountered with these DJ stents are flank pain, hematuria, lower urinary tract symptoms predominantly in the form of urgency frequency. The late complications are encrustation and blockage, spontaneous fragmentation, stent migration, ureteror-arterial and ureterointestinal fistulae (especially with rigid stents). Stent encrustation rate according to time frame ranges from 9.2% at <6 wks, through 47.5% at 6-12 wks to 76.3% at >12 weeks. These encrustations mainly made up of calcium oxalate, ammonium magnesium phosphate and calcium phosphate [8]. Luminal blockage rate has been documented up to 30% with indwelling time to 3 months [9]. In literature it is reported that 14.3% of the stents became difficult to remove in 2 months and 42.8% at 4 months [10]. A research done in Japan reported 15 ureteral stents became irremovable with mean indwelling times of 20 months [11]. Our study reflects encrustation of DJ stent as a most common presentation (47.8%) among all complications. Stent migration is another well-known complication. It could be due to incorrect size selection, faulty stent design or wrong insertion technique. Incorrect size selection of stent results most commonly in upward migration [12]. In our study we found 3(13%) patient with stent migration. In literature incidence of stent migration is around 9.5% to 6.84% [13, 14]. Prolong stenting can lead to stent fragmentation. Careful Inspection of these broken stents has shown that thier fracture lines were passing through the stent side holes [15]. The starting event could be "leaching", a reaction caused by a progressive chemical urinary assault on the stent plastic and its integrity that ultimately leads to fragmentation of the stent [16, 17]. In our research 2(8.6%) of patients were presented with stent fracture. One patient was managed by ureteroscopic removal and another by percutaneous removal. Literature suggests 1.3% to 4.79% patients present with stent fracture [13, 14].

For treatment prospective mildly encrusted stents respond well with extra corporeal shockwave lithotripsy while patients with a large proximal stone formed over a DJ stent in kidney may need PCNL [18, 19]. Broken ureteric fragments can be managed by ureteroscopic removal. Some patients may require multimodal treatment strategies to manage these cases [20]. Final consequence of any renal insult is loss of function and that is true in our study as well. One of our patients visited after 37 months of DJ stenting with stone and pyonephrosis, ultimately managed by nephrectomy. In our institute we are maintaining a stent diary clearly mentioning indication, date of stenting and date of removal. Every patient is asked for two mobile numbers (free to provide relatives or neighbor’s phone number). Periodically this diary has been checked by the surgeon himself to call patient who has crossed the 12 week time duration. However many centers are now heading towards computerized patient registry system which can generate reminders messages for given mobile numbers.
CONCLUSION

Ureteric stents are an integral part of most of urological surgeries however inappropriate follow up from patient or urologist may lead to severe complications and medicolegal issues. Most of the long term ureteral DJ stent related complications can be managed by single procedure but few cases requires multiple procedures hence they should be removed as soon as their purpose solves. Although most of the forgotten DJ stent complication can be managed successfully, best treatment will be proper pre and postoperative counseling of the patient and their relatives. Surgeon should ensure its closed tracking and earliest removal.

REFERENCE

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