



## Forgotten Double-J Ureteral Stent

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Since the article of Zimsking, 1967, that described the use of a silicon ureteral splint to unblock the renal-ureteral unit, the double J catheter is being routinely used in several urological procedures, particularly in those with obstruction due to urinary stones, urogynecological tumors, urinary stenosis and retroperitoneal fibrosis (1). It can also be used following ureteral lesions or to reduce the risk of inadvertent trauma during complex abdominal and pelvic surgeries (2). Many patients are treated only with the double J catheter and in others the drainage of the urinary system may postpone definitive treatment for a better moment, particularly in the presence of infection.

There are some negative side effects of its use such as discomfort and alteration of micturition, hematuria, perineal and genital pain, and the occurrence of urinary infections or even pyelonephritis (3). New catheters are being developed, with different designs, width, length, material, flexibility, in order to minimize these symptoms. Other clinical studies have evaluated drugs that can ameliorate the clinical setting, such as anticholinergics, alpha-blockers and analgesics.

However, more severe complications are observed with forgotten catheters at the urinary system, that encrust, form stones, fragment, "stenturia" and encrust with obstruction and loss of renal function (4, 5-7). These cases are complex and require multiple endo-urological procedures in order to remove the catheter and the associated stones, including shock wave lithotripsy, per-

cutaneous surgery, ureteral and renal lithotripsy, or even nephrectomies (6-8). Lam et al. analyzed 26 forgotten catheters and showed that it was necessary the use of 2.7 procedures to resolve the situation (9). Forgotten double J stents and their complications are not rare in literature (4-8, 10, 11) particularly in public health services and lower income patients, due to the difficulty to follow up this population that are unaware of the severity of the condition. Likewise, Divakaruni et al observed 16% of forgotten double J catheters in their retrospective cohort, and identified a higher risk group including males and patients without medical insurance (2.5 and 6 times more prone to this complication, respectively) (11). The professional that inserts the catheter must be aware of the follow up of those patients and must certify that the catheter is removed on time, according to good medical practices. In literature, it is observed that the median time for complications of indwelling catheter at the urological system is 3-24 months (3-5, 12). El-Faqih showed that the rate of complications was 9.6% when the catheter was removed in up to 6 weeks following implantation. When maintained for 6 to 12 weeks, this rate rises to 47.5% and for more time to 76.3% (13). Similar figures were observed by Kawahara; incrustation was observed in 26.8% before 6 weeks and reached 75.9% when maintained for more than 12 weeks (5). However, patients characteristics such as hipercalciuria, pregnancy or severe predisposition to stones may lower this time.

Aside from clinical complications as exposed, we must be aware of legal implications. Professionals may suffer lawsuits; patients may feel that they were harmed for not being correctly informed about the need of catheter removal or even being unaware that they were carrying one. Duty et al. revised malpractice litigations from 2005 to 2010 and found 585 urological complaints. Among them, 25 (4.3%) were related to endourological procedures and 4 due to forgotten double J catheter. Osmal et al revised the lawsuits of the British Health System from 1995 to 2009, and found 13% complaints related to forgotten ureteral stents, more frequently at post-operative (14). Prevention is the better alternative for this situation, in spite of the many efficient endourological treatments. The use of a fixed wire at the distal end of the catheter exteriorized at the urethra eases removal and minimizes forgetfulness. Follow up procedures of patients with double J stents were proposed in order to control these patients by cell phones, computer software and warning systems of patients and doctors (15-18). Sancaktukar et al. performed a randomized study and showed that the group that was followed by SMS for catheter withdrawal was statistically efficient (16). Regardless of which method, it is fundamental that patients with a double J catheter must be monitored and followed-up, particularly in services with high number of procedures and professionals, such as public health services and medical residency programs. The use of warning systems and other similar technologies are more efficient than written forms or cards delivered to patients, since up to 25% of them were not registered (19,20).

Forgotten ureteral stents may cause only mild symptoms or even loss of renal function. After catheter implantation, patients must be well monitored to avoid discontinuity of treatment and maintenance of the catheter for more time than needed. The professional is responsible for follow-up and removal of catheter at the correct time, avoiding related complications.

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