INDICATIONS AND COMPLICATIONS OF INDWELLING URETERAL STENTING AT NMCH, NAWABSHAH

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ABSTRACT
Objective: *To analyze the pattern of clinical indications and complications of Indwelling Ureteral Stents.*
Design & Duration: *A prospective study from November 2002 to November 2005.*
Setting: *Department of Urology, Nawabshah Medical College Hospital (NMCH), Nawabshah.*
Patients: *All patients who underwent J. J. Stenting were included in the study.*
Methodology: *These patients were evaluated by taking a detailed history, performing comprehensive clinical examination and doing various investigations like blood urea, serum creatinine, renal ultrasound, X-ray KUB, IVU, and preliminary cystoscopy. Majority of stents were placed endoscopically under local/spinal anaesthesia and were removed easily under topical anaesthesia cystoscopically.*
Results: *Of the total 120 cases, 95 (79.2%) had upper urinary tract obstruction and nine (7.5%) upper tract urinary leakage, while eight (6.7%) patients required stenting during upper urinary tract surgery and another eight (6.7%) after upper tract endoscopic manipulation. In majority of cases stents were successful in providing free drainage. No mortality was seen during the use of stents, but certain minor and major complications were encountered in 95 (79.2%) cases.*
Conclusion: *This study show that the decision of ureteral stenting must not be taken lightly, as it is not free of complications. Certain precautions and guidelines must be observed whenever they are deployed. It is important to remember that the ureteral stent is a double edged weapon and can behave as a friend or an enemy.*

KEY WORDS: *Ureteric Stents, Indications, Complications*

INTRODUCTION

Indwelling ureteral stents provide free drainage from the kidney to the bladder, reduce or eliminate urinary leakage and provide ureteral stenting[1]. The use of the indwelling stents for internal drainage of the upper urinary tract has now become an essential part of the urologist's armamentarium[2]. JJ or double J stents have proved their efficacy in relieving and preventing upper urinary obstruction in the various urological conditions[3].

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However their use is not free of complications and problems[4].

JJ stents are usually made from silicone or polyurethane. Ideal stents are those which are easy to insert, remove and replace, having good flow out characteristics and radio-opaque properties, biologically inert and chemically stable in urinary tract. Once placed, they should stay in their fixed position[5].

Historically, the use of ureteric catheters was first reported by Peck[6]. The first clinical application was reported in 1967 and later in 1970[7]. The common problem with the early stents was their tendency to migrate[8]. In 1978 Finny described the double J stent, having hooks on either end to prevent upward and down ward migration, which since then has been adopted as the indwelling ureteral stent[9]. Ureteral stenting is a routine procedure in daily urological practice and is commonly indicated to relieve and prevent upper urinary obstruction and to

Indications	No.
Obstucted Uropathy (n=95)	
Acute Stone Management	87
Pelvi-uretericObstruction	6
Retroperitoneal Fibrosis	1
Acute Hydronephrosis Pregnancy	1
Open Surgery Group (n=8)	
Pyeloplasty	3
Pyelolithotomy	3
Ureterolithotomy	2
Prophylaxis Group (n=8)	
After Dormia Extraction	6
After URS	2
Miscellaneous Group (n=9)	
Post-pyelolithotomy Leakage	7
Ureterovaginal Fistula	2

Table I. Indications of Stenting

manage ureteric injuries to minimize urinary extravasation and to expedite the ureteral healing, which other wise could be prolonged and hazardous to the patient[10]. This study describes the pattern of indications and the complications of ureteric stenting in our region.

PATIENTS & METHODS

This prospective study was carried out on 120 patients who underwent JJ stenting for various urological problems in the Urology ward of NMCH from Nov. 2002 to Nov. 2005. All these patients were evaluated clinically and were assessed by investigations including renal imaging and renal function profile.

The mode of placement of JJ stent was retrograde insertion under spinal anaesthesia in most cases, using the cystoscope in 100 cases, ureteroscope in 12 cases and operative insertion in eight cases. The stents were removed endoscopically under topical anaesthesia in 116 cases and by open surgery in four cases.

Complications	No.	%
Stent Encrustation	21	17.5
Stent Migration	14	11.7
Secondary Stone Formation	10	8.3
Stent Fracture	10	8.3
Ureteral Perforation	7	5.8
Stent Colic	6	5.0
Pyelonephritis	6	5.0
Bladder Storage Symptoms	5	4.2
Dysuria	5	4.2
Stent Stucking	5	4.2
Gross Haematuria	3	2.5
Malposition	3	2.5

Table II. Complications of Stenting

RESULTS

Stents were inserted in 120 patients (88 male, 32 female), whose ages ranged from 18-95 years, mean age being 35 years. Table I shows the pattern of indications; 95 (79.2%) cases had upper urinary obstruction (unilateral in 55 and bilateral in 40), mainly due to the stone disease in 87 cases.

No mortality was attributed to the use of stents but certain complications were encountered in 95 (79.2%) cases as depicted in Table II. Figs.1 & 2 show the complications in some cases. Table III shows the relationship of complications with the duration of stenting. Stent encrustation, stone formation and stent fractures were directly related to the duration of stenting.

Table III. Relationship of Complications with Duration of Stenting

Duration	Encrustation	Stone Formation	Migration	Fracture
0 - 3 months	5	--	10	--
3 - 6 months	9	2	3	2
6 - 9 months	7	3	1	6
> 9 months	--	5	--	2

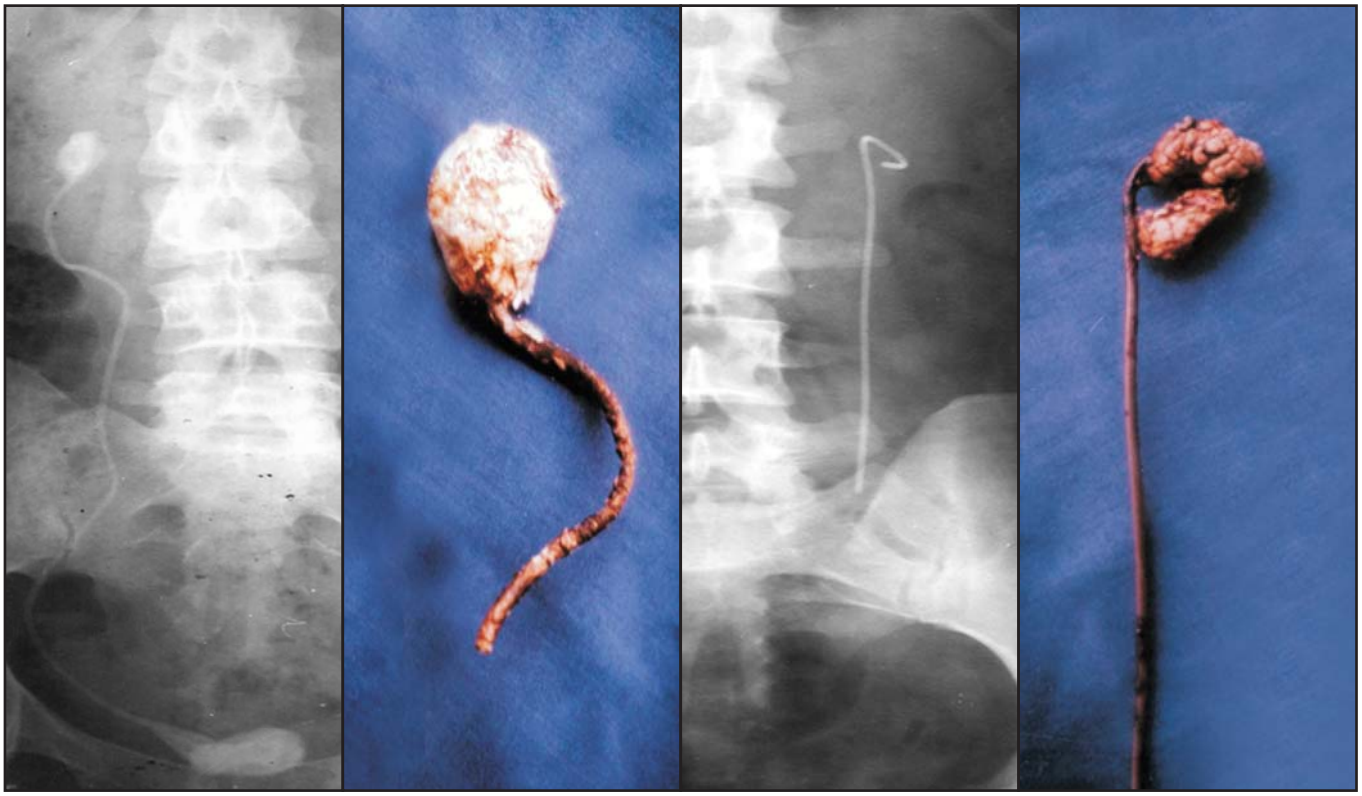

Fig.1. Complications of J. J. Stent - Stone Encrustation

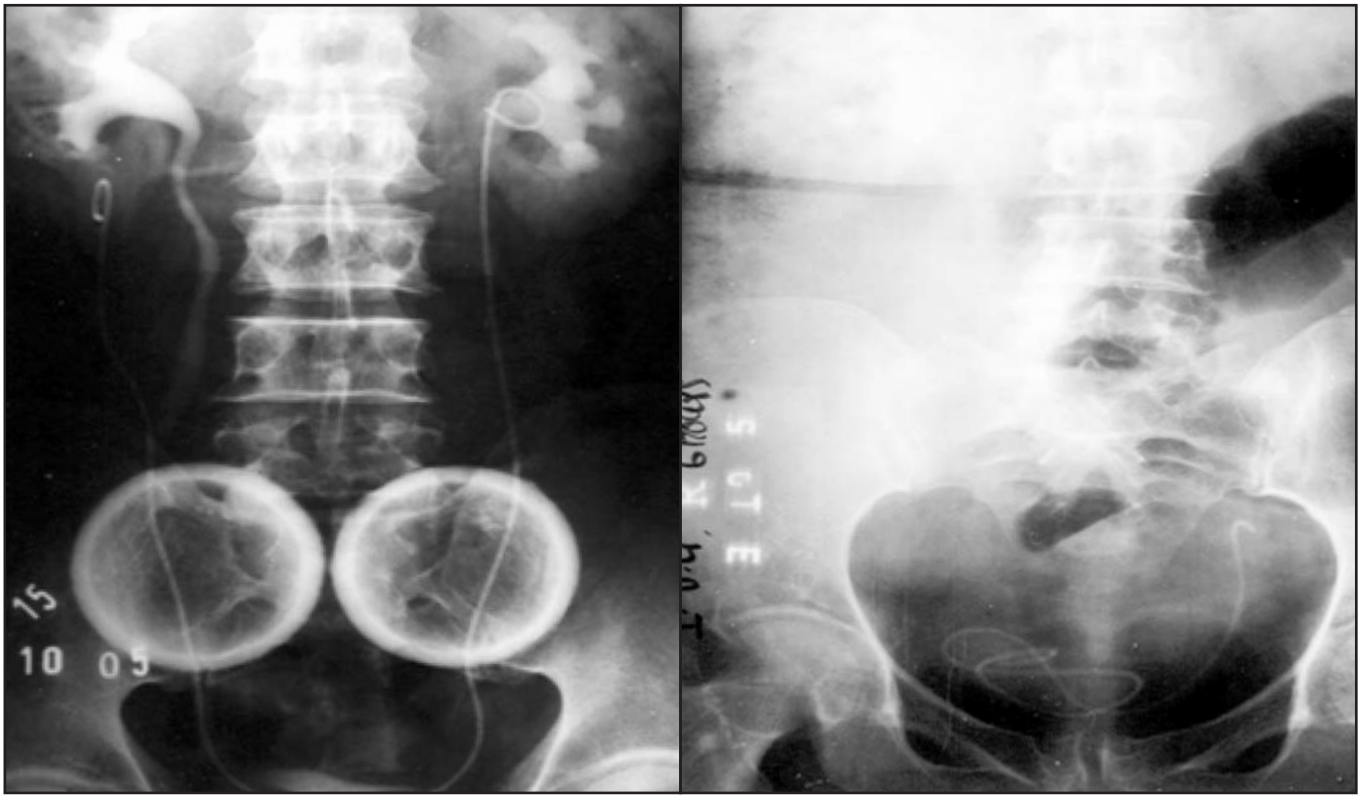

Fig.2. Complications of J. J. Stent - Stent Migration

DISCUSSION

The double J ureteral stents have become one of the most basic and valuable tools in the urological practice. They provide direct drainage of the upper urinary tract to the bladder without the need for external diversion. However, they can cause complications such as migration, occlusion, breakage, stone formation, etc.[11-13] As the indications for their use have expanded during the last few years, the frequency of complications have also increased[14].

In our study the indications and complications of ureteral stenting were statistically different from other studies. Nawaz et al[1] reported that the commonest indication was prophylactic stenting followed by relief of obstructive uropathy, while Saltzman et al[4] described obstructive uropathy as the commonest indication. In our study the commonest indications were obstructive urotpathy followed by prophylactic stenting.

Nawaz et al[1] reported an overall complication rate of 15% after ureteral stenting, which is much lower than that of other studies. Damiano et al[14] on the other hand described a complication rate of 70%, which is similar to our complication rate of 79.2%. Our higher complication rate could be attributed to the factors like illiteracy, poor material of the stents, presence of urinary infection and poor compliance on the part of the patient.

Common complications observed by Nawaz et al[1] were stent encrustation (10.5%), stent migration (3.5%) and stent breakage (4.5%). Damiano et al[14] on other hand described stent encrustation (24.5%), stent migration (9.5%) and stent breakage (1.3%) as the common complications. In our study stent encrustation (17.5%), stent migration (11.7%), stent formation and fracture (8.3% each) were the complications noted.

Complications associated with the use of ureteral stents are basically mechanical in nature and are related to the stent material, augmented by the duration of indwelling period. In our series stent encrustation and fracture, and stone formation were seen more in those patients where the indwelling period was more than three months. This observation is shared by other authors also[1,4,11,,14,15]. Hence stent monitoring is essential and should include regular monthly urine cultures, serum creatinine and X-ray KUB. Renal scans may be indicated where renal jeopardy is suspected[11,12,15]. Ultrasonography is indicated in situations where radiography is contraindicated or fails to visualize the stents due to the loss of stent radio-opaque coating[16-18].

An ideal, safe, minimal and optimal duration for the stent has not been described. No matter what the stenting duration is, all the stents will form a biofilm with some degree of bacterial adherence and if left for a sufficiently long time nearly all stents will encrust. However, the safe period is probably 6-8 weeks[19]. In our series they remained in place for a much longer time, mostly due to poor patient's compliance.

JJ stents cause so little irritation that the patient and the urologist can forget about their presence[20-30]. Hence a lot of stress should be paid on the counselling of the patient regarding their presence, complications and removal. Our experience with JJ stenting has not been a good one due to the higher complication rate.

CONCLUSION

DJ stents are an important tool in a urologist's armamentarium to prevent and relieve obstruction. Routine use is not justified, as they are not free of complications. Their use must be strictly restricted to selected cases and one must be familiar with their merits and demerits. Certain precautions and guidelines must be observed whenever they are deployed. Adequate training is of paramount importance because in untrained hands they may do harm than good. It is very important to remember that the ureteral stent is a double edged weapon, which can behave like a friend or a foe.

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