

Successful Balloon Expandable Stent Placement in the Management of Severe Proximal Urethral Stricture in a Cat

Shipov, A.,^{1#} Zafrany, A.,^{2#} Kahana, N.,¹ Peery, D.,¹ Sommer, A.,² Winkler, R.,² and Segev, G.^{1*}

¹ Koret School of Veterinary Medicine, The Hebrew University of Jerusalem, Israel.

² Frishman Dizingoff Veterinary Center, Tel Aviv, Israel.

First two authors equally contributed to the manuscript.

* Corresponding Author: Dr. Gilad Segev, Koret School of Veterinary Medicine, The Hebrew University of Jerusalem, Israel. Email: gilad.segev@mail.huji.ac.il

ABSTRACT

This case report describes an 8 months old, male intact, stray cat, which was presented to a local veterinarian due to inappetence, lethargy and dysuria. A large and firm urinary bladder was palpated. A urinary catheter was placed, however a resistance was felt a few cm proximally to the urethral orifice. Positive urethrogram revealed a 1 mm in diameter and 12 mm in length stricture in the proximal urethra. Due to the location and the length of the stricture, balloon dilation and stent placement were considered the best treatment options. Under fluoroscopic guidance the stricture was balloon dilated and a balloon expandable metallic stent was placed across the stricture. The cat recovered uneventfully and was able to urinate normally. This is the first report to describe a successful retrograde stent placement in a male cat that did not previously undergo perineal urethrostomy.

Keywords: Urethra, Feline, Feline Interstitial Cystitis, Azotemia.

INTRODUCTION

Urethral obstruction is a common disorder in cats (1). It occurs most commonly in young male cats due to urethral plugs, and less commonly due to urethroliths, urethral stricture, neoplasia and external urethral compression. Most cases are managed medically, however a subset require surgical intervention, among which perineal urethrostomy in the most common (2). The present report describes successful management of severe proximal urethral stricture associated with trauma in a young male cat.

CASE REPORT

An 8 months old (estimated), male intact, stray cat, weighing 3.3 kg was presented to a local veterinarian due to inappetence, lethargy and dysuria. The cat was found by his new owners in lateral recumbency, soaked with urine. The cat was

held indoors for few days during which time he presented with severe stranguria, pollakiuria and urinary dribbling. On presentation to the referring veterinarian, vital signs were normal, however; a large and firm urinary bladder was palpated. The remainder of the physical examination was unremarkable. Blood work and urinalysis were not performed since this was a stray cat. The cat was anesthetized with medetomidine (80 µg IM, Dormosedan, Orion Pharma, Espoo, Finland) and a 3.5 Fr urinary catheter was inserted. Resistance was felt few cm centimeters proximally to the urethral orifice but with reasonable force the urinary catheter was advanced to the bladder. The cat recovered uneventfully. Urine production was not quantified, but was assessed to be normal. Following recovery the cat improved and became active. Phenoxybenzamine (Dibenylene, Mercury pharmaceutical Ltd., Croydon, UK) at 2 mg, PO, q12hr was administered to decrease urethral tone. Three days later, the urinary cath-

eter was removed, but the cat represented with stranguria and pollakiuria and was not able to urinate; therefore a urinary catheter was reintroduced. Resistance was felt once again at the same location. Three days later the urinary catheter was removed, however the cat was still unable to urinate.

Survey radiography raised the suspicion of a healing fracture at the greater trochanter of the femur. Positive contrast urethrocytography documented a stricture in the proximal urethra. Due to the location and the length of the stricture, balloon dilation and stent placement were considered the best treatment option. The cat was referred to the Hebrew University Veterinary Teaching Hospital for further assessment and treatment. Pre-anesthetic blood work (i.e., com-

plete blood count and serum biochemistry) was unremarkable. The cat was anesthetized and the perineal area was clipped and aseptically prepared. A marking catheter with 10 mm markings was placed within a red rubber tube into the colon. A urinary catheter was then introduced into the distal urethra and a positive contrast urethrogram was performed to measure the stricture diameter and length and to select an appropriate size stent (Figure 1). Based on the measurements performed under fluoroscopic guidance, a 1 mm in diameter and 12 mm in length stricture was confirmed. Severe dilatation of the urethra was also identified proximally to the stricture (Figure 1), likely resulting from the long standing obstruction. A 0.010 Fr guidewire was placed through the

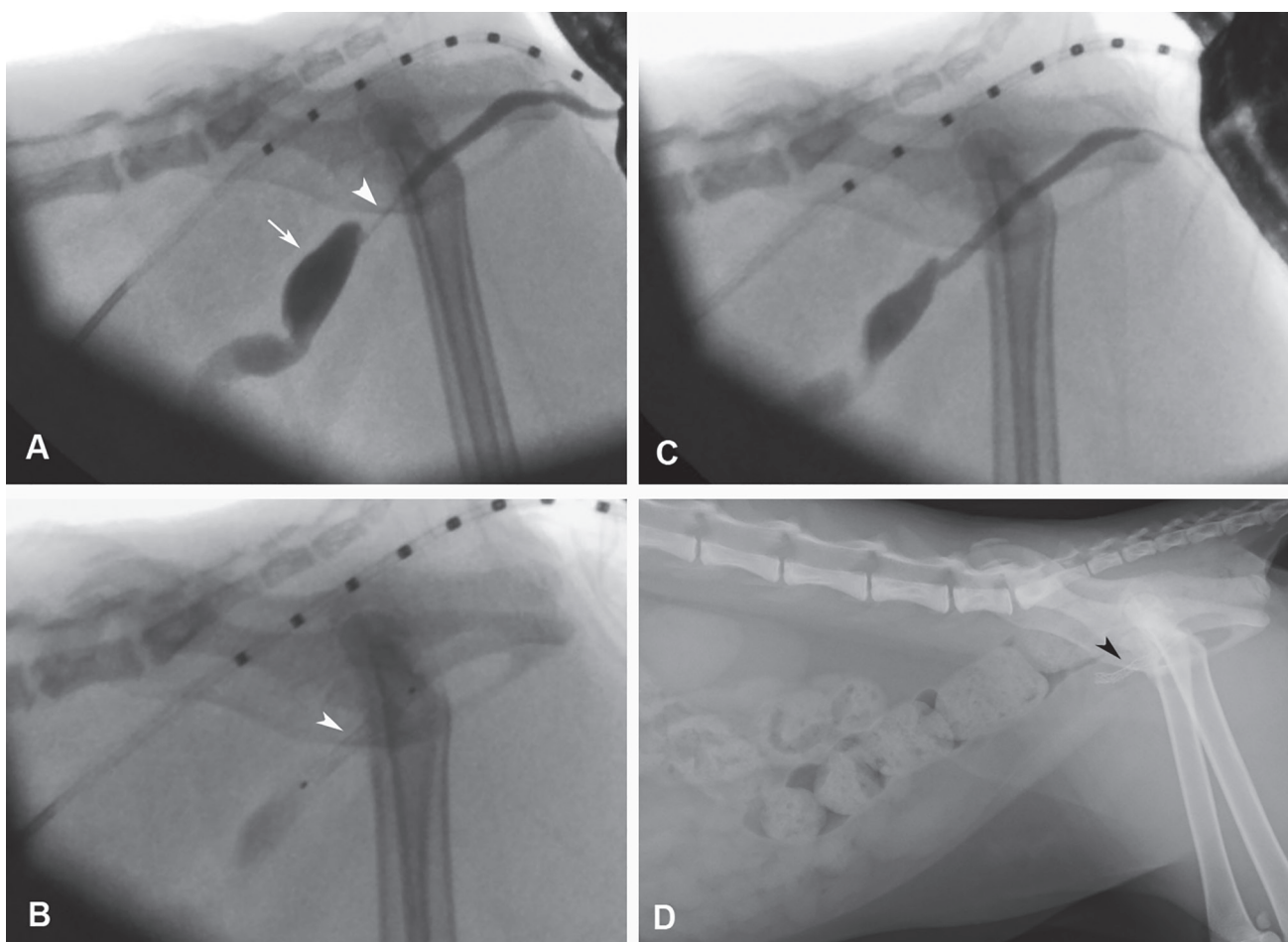


Figure 1:

- A)** Fluoroscopic image of positive contrast retrograde urethrogram before stent placement. A marking catheter was placed in the colon to enable accurate measurements of the stricture diameter and length. Note the severe stricture in the proximal urethra (white arrowhead) and the marked dilatation proximally to the stricture (white arrow).
B) Fluoroscopic image of the stent after its deployment (white arrowhead).
C) Fluoroscopic image of positive contrast retrograde urethrogram after stent placement.
D) Survey radiographs two weeks after the procedure depicting the stent (black arrowhead).

urinary catheter. Once indentified in the urinary bladder, the urinary catheter was removed and a 1.5 mm in diameter and 15 mm in length balloon was inserted and placed under fluoroscopic guidance along the stricture. The balloon was dilated and left in place for few seconds until ruptured. The balloon was then removed and a balloon expandable metallic stent, 18 mm in length with a maximal diameter of 2.8 mm was placed over the guide wire, under fluoroscopic guidance (Figure 1). The stent was then deployed and the balloon was removed. Following stent placement, positive contrast radiography revealed complete opening of the urethra (Figure 1). The cat recovered uneventfully, and immediately was able to urinate normally. Incontinence was not noted. In the subsequent days the cat showed mild pollakiuria which spontaneously resolved. Two weeks later, survey radiographs were performed confirming the correct location of the stent (Figure 1).

DISCUSSION

Urethral obstruction is a common disorder in male cats (1, 3). It occurs most commonly in young cats due to urethral plugs, and less commonly due to urethroliths, urethral stricture, neoplasia and external urethral compression (3). The cause of the urethral stricture in this cat cannot be definitely determined, as it was previously a stray cat and medical history was not available; however, considering his young age and the presence of a femoral fracture, it most likely resulted from trauma and potentially previous urethral tear that resulted in a stricture.

Most cases of urethral obstruction are managed medically and obstructions are relieved by urinary catheterization. Medical management is directed at correcting fluid and electrolyte imbalances and decreasing urethral tone (e.g., alpha antagonists) (1). In a subset of cats, medical management fails, or is inappropriate (e.g., strictures), and surgery is indicated to relive the obstruction (2).

Perineal uerthrostomy (PU) is most commonly employed procedure for distal urethral strictures (4). In the case presented herein the obstruction was proximal and therefore PU was not a valid option. Surgical options for proximal urethral strictures are limited and include subpubic urethrostomy, transpelvic urethrostomy, resection and anastomosis, and temporary or permanent cystostomy tube placement (5). These procedures are not commonly performed and are as-

sociated with high complication rate, including stricture formation urine leakage, dehiscence, skin necrosis, incontinence, recurrent urinary tract infections and perineal herniation (5).

Interventional radiology is gaining popularity in veterinary medicine during the last years (6). Urethral stents are placed in increased frequency to relieve obstructions in the urethra, mostly in dogs, as a palliative measure to treat urethral obstruction due to neoplasia (7). Complications of urethral stenting include incontinence, re-obstruction, and damage to the urethral mucosa (7). In this case, stent placement was considered a valid option due to the location and length of the obstruction. Resection and anastomosis was considered not feasible in this case due to the length of the stricture, while other surgical alternatives would have resulted in substantial alteration of the normal anatomy, and thus were not considered the first therapeutic option.

Few case reports and case series have documented stent placement in cats with benign and malignant urethral obstructions (8-11). In most reported cases, self-expandable metallic stents were used (7, 8, 10). In this report due to stricture characteristics, stent availability, and financial constraints a balloon expandable metallic stent was used. The small stent and delivery system used in this case allowed retrograde stent placement, despite the fact that this was young male cat. This is in contrast to previous reports (8, 10, 11), in which retrograde stent placement was performed in male cats only following PU. Otherwise, urethral stents in male cats had to be placed in an antegrade fashion (8, 10, 11). Retrograde stent placement in the current case was feasible due to the small diameter of the stricture.

The stricture of the cat in the present report was not typical due to its length and location. When stents are placed in the proximal urethra of cats, one should bear in mind the relatively distal location of the ureters in the vesico-urethral junction. Laser cut balloon expandable stents, such as the one used in this procedure, have the advantage of maintaining their length after deployment, and are recommended for relieving urethral obstruction (7). This is unlike some other self expandable metallic stents which undergo shortening after deployment (7). The use of a laser cut stent assisted precise placement to avoid the cat's ureters in this case. The disadvantage of balloon expandable stent, compared with self-expandable stent, is the higher potential for mucosal damage. Self-expandable laser cut metallic stents are more flexible and potentially less traumatic as these expand more gradu-

ally based on the urethral diameter. To minimize damage to the urethral mucosa, a balloon was initially used to verify that the stricture can be dilated and to minimize urethral damage when deploying the stent (6).

Urethral obstruction in cats occurs most commonly at a young age (1), and so do strictures which complicates this disorder. Urethral stents, if selected as a solution to relieve the obstructions, are thus expected to be in place for a long period of time. It is yet to be determined whether stent placement is associated with a lower complication rate compared to PU, when the latter is feasible. Due to the proximal location of the stricture and its length most of the surgical options could not have been applied in this cat. Stent placement allowed the preservation of the normal anatomy, and for the ability to perform the aforementioned surgical procedures, if unmanageable complications occur.

In summary, this case report describes successful balloon expandable stent placement in a cat as a treatment from proximal urethral obstruction and is the first to be performed in a retrograde fashion in a male cat that did not undergo PU prior to the procedure.

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