

CLINICAL, SURGICAL ASPECTS AND COMPLICATIONS ASSOCIATED WITH ABDOMINAL/PREPUBLIC URETHROSTOMY IN FELINES

ASPECTE CLINICE, CHIRURGICALE ȘI COMPLICAȚII ASOCIATE URETROSTOMEI ABDOMINALE/PREPUBIENE LA FELINE

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ABSTRACT | REZUMAT

Regardless of the type of material that causes it, urethral obstruction is a serious condition that is increasingly being diagnosed as urgent. It is referred to as Feline Lower Urinary Tract Disease (FLUTD), which also includes the symptoms of dysuria syndrome, urethral obstruction, haematuria, and the development of urinary calculi. Urinary urolithiasis syndrome is defined as the occurrence of familial, congenital, or acquired pathophysiological factors that together progressively increase the risk of precipitation of urinary metabolites to form calculi. Ureterolithiasis is of greater importance in felines compared to dogs and is most often diagnosed incidentally on routine ultrasound examination of the animal. Clinical signs are most often correlated with haematuria or urethral obstruction, but nonspecific signs such as a decrease in appetite or body weight should also be remembered. The persistence of urethral obstruction or relapse of ureterolithiasis should be considered, including surgical treatment. The use of surgical therapies in the treatment of urolithiasis depends on very many factors, such as the type of calculi and their location, the condition of the animal, and the type of pathology (obstructive or non-obstructive). In this study, we chose a sample of 39 felines that presented themselves at the FMVB hospital for the surgical remedy of lower urinary tract disorders. The study is a comparative one between short-term and long-term complications, so the comparison between perineal urethrostomy (PU) and prepubic urethrostomy (PPU) is carried out from the moment of intervention up to 3 months. From the monitoring of the 39 patients, a total of 26 presented complications with varying degrees of expression, of which we also reported two deaths.

Keywords: prepubic urethrostomy, urethral obstruction, urinary tract, complications of surgery

Obstrucția uretrală, indiferent de tipul de material ce o produce, este un eveniment major cu caracter urgent din ce în ce mai frecvent diagnosticat, descris sub denumirea de Sindrom urologic felin (FUS) care mai apoi a fost actualizat ca Boala Tractului Urinar Inferior la feline (FLUTD), ce include sindromul de disurie, obstrucție uretrală, hematurie și inclusiv formarea calculilor urinari. Sindromul de urolitiază urinară se definește ca apariția unor factori fiziopatologici familiali, congenitali sau dobândiți care împreună cresc progresiv riscul de precipitare a metabolizilor urinari pentru a forma calculi. Ureterolitiiza prezintă o importanță mai crescută la feline, în comparație cu câinii, de cele mai multe ori diagnosticată incidental la examenul ecografic de rutină al animalului. Semnele clinice sunt de cele mai multe ori corelate cu hematuria sau obstrucția uretrală, dar trebuie amintite și semnele nespecifice precum scăderea apetitului sau a greutății corporale. În persistența obstrucției uretrale sau recidiva ureterolitiizei trebuie avut în vedere inclusiv tratamentul chirurgical. Utilizarea terapierilor chirurgicale în tratamentul urolitiizei depinde de foarte mulți factori precum tipul de calculi și localizarea acestora, starea animalului, tipul de patologie (obstrucțivă sau non-obstrucțivă). În acest studiu, am ales un eșantion de 39 de feline care s-au prezentat la spitalul FMVB pentru remedierea chirurgicală a tulburărilor tractului urinar inferior. Studiul este unul comparativ între complicațiile pe termen scurt și cele pe termen lung, astfel încât comparația dintre uretostoma perineală (PU) și uretostoma prepubiană (PPU) se realizează din momentul intervenției până la 3 luni. Din monitorizarea celor 39 de pacienți, un total de 26 au prezentat complicații cu diferite grade de exprimare, dintre care s-au raportat și două decese.

Cuvinte cheie: uretostoma prepubiană, obstrucție uretrală, tractul urinar, complicații post-chirurgicale

Problems affecting the lower urinary tract of domestic felines are increasingly common and prevent the proper emptying of the bladder by inducing a parti-

al or total obstruction at the urethral level (13). This situation can become an extremely urgent medical or surgical emergency because it will very quickly lead to acute kidney damage of the obstructive type or the rupture of the bladder if the obstruction is not remedied immediately (16). At this time, there is no clear breed, gender, or age predisposition to explain the

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phenomenon of obstruction, but many studies have highlighted the frequency of these pathologies in predominantly sterilized felines aged 1-6 years (11). More and more frequently lately, pathologies with a genetic predisposition in human medicine, such as cystinuria and xanthinuria, have been discovered and are under research in canine urinary pathology but are less known or researched in feline medicine (9).

Nutrition is a significant factor in the pathophysiology and treatment of feline urolithiasis (5); the correlation between an increase in the level of food magnesium or protein in the feed and the appearance of struvites is demonstrated (9). Also well-known is the sensitivity of felines to stress; this is an extremely important factor in the development of urinary pathology (13). The mechanism of action in the urinary tract is explained by the induction of metabolic acidosis, which predisposes the animal to the formation of calcium oxalate-based calculi (9). Another mechanism by which stress acts on the body is by decreasing the water intake, and the compensatory increase in the level of vasopressin favours the absorption of water at the renal level, thus producing a concentration of the urine produced (hypertonic urine) (9, 11).

FLUTD is quite rarely diagnosed in very young animals; the vast majority of felines show the first signs of illness after the age of 2-4 years (8). Much more exposed to the appearance of complete or incomplete urethral obstruction are male sex patients due to the anatomical peculiarities of the penis and (4), respectively, the narrowing of the urethral canal to the tip of the penis (15). Most of the calculi are present in the lower urinary tract (bladder), without highlighting specific clinical manifestations (12). Most mild cases are accidentally discovered during routine clinical examinations or when animals show specific clinical signs of cystitis or urinary infection (3). When the urinary calculi are localized at the urethral level, clinically there are two distinct forms of evolution: total obstruction, which causes the impossibility of urination and has an urgent character in terms of the secondary changes it causes, and partial obstruction, with clinical signs associated with urethral inflammation such as dysuria, macroscopic and microscopic haematuria, and frequent urination with small amounts (6). The ultrasonographic examination allows the visualization of the calculi at the renal level, the bladder level, and the ab-

dominal portion of the urethra as structures of different sizes and hyperechogenicity that determine the characteristic ultrasound aspects (14). The specific therapy takes into account the stabilization of the patient and the acid-base imbalances that have occurred, as well as the elimination of obstruction through non-invasive or invasive techniques (10). Diseases of the lower feline urinary tract (FLUTD) are frequently associated with complications that refer directly to surgical remediation techniques (7). Urethrostomy is a permanent surgical technique with the aim of creating the opening of the urethra to the cutaneous plane through a wider orifice (2), through which the passage of small uroliths is easier, thus preventing obstruction (1). From the point of view of the surgical approach, two important techniques are described in the special literature: perineal urethrostomy (PU) and abdominal or prepubic urethrostomy (PPU) (16).

The purpose of this study is to comparatively discuss the complications of the two basic surgical techniques recommended for FLUTD management, taking into account the multitude of pre- and post-operative factors that make this intervention difficult.

MATERIALS AND METHODS

A total of 39 felines were taken into the study; cat owners presented themselves at the clinic of the faculty of veterinary medicine or were sent for the remedy of disorders of the lower urinary tract without the possibility of non-invasive remediation. All the felines taken in the study were examined for certainty to establish with certainty the type and site of urinary lesions and, indirectly, the type of surgery required for remediation. All the cases examined were classified into two categories, depending on the location of the urethral lesions (Table 1).

The animals were subjected to surgery by performing perineal or abdominal urethrostomy, in accordance with the location of the urethral lesions, by applying the specific surgical protocols for perineal or abdominal urethrostomy.

RESULTS AND DISCUSSIONS

The results of the surgical interventions were evaluated from the point of view of the surgical complica-

Table 1

Localization of urethral lesions in felines subject to urethrostomy

Localization of the lesion along the length of the urethra	Traumatic injury (demolition/warding of the urethra)	Urolithiasis	Penile oedema/formation
Penile	17	10	2
Intrapelvic	4	6	0

Table 2

Short-term complications of urethrostomy surgery

Short-term complications	Urethrostomy	
	Perineal	Prepubic
Haematuria and/or strangury	5	0
Bacterial cystitis	2	1
Urinary incontinence	2	0
Recurrent urethral obstruction	5	0
Peristomal dermatitis	1	2
Outflow of urine into the peristomal subcutaneous space	0	1
Dehiscence of the wound	2	0
Stricture of the stoma	4	1

tions that occurred and according to the quality of life of the patients after the convalescence period. Short-term results were defined as those recorded in the patient record during the first two weeks after surgery. During the study period, the suture threads were removed 10–14 days after the intervention. From a surgical point of view, short-term results were divided into minor complications and major complications. Minor complications were considered those that did not require any additional intervention or were remedied by applying simple pharmacological treatments, and major complications were considered those that required surgical reintervention. Long-term results were defined as those that are recorded after 4 weeks postoperatively and were obtained following periodic controls, at regular intervals, or when the patients' conditions required the return to specialized control.

Short-term complications were reported in 26 cases out of the total ones operated (66.66%), of which 22 (56.41%) had minor complications and 4 cases (10.25%) had major complications (Table 2).

Long-term complications were diagnosed in 13 (33.34%) felines under surgery, of which long-term mortality was observed in 2 (5.12%) of all those operated on. Of the two cases reported with long-term mortality, one was euthanized about 3 months after surgery due to recurrent problems. The post-surgical diagnosis was penile sarcoma, with the resumption of specific symptomatology after 3 months post-surgery.



Fig. 1. PU in a male cat with urethral trauma. Intense haemorrhage 24 hours post-surgery

Regardless of the surgical remedy technique that we choose in FLUTD management, the possibility of developing complications or prolonged-term relapses should be taken into account.

In the study, we structured the complications encountered into two categories based on the time travelled from the day of the operation to the moment of their appearance or communication with the doctor.

Table 3

Long-term complications of urethrostomy in the cat

Long-term complications	Urethrostomy	
	Perineal	Prepubic
Haematuria and/or strangury	0	1
Bacterial cystitis	0	4
Urinary incontinence	0	2
Peristomal dermatitis	0	3
Obstruction of the stoma	2	1

Thus, both short-term and long-term complications make interventions require proper and rigorous monitoring of the patient. In the group formed for this study, age, nutrition, living conditions, and body weight were similar. Postoperatively each patient received an Elisabethan collar for surgical wound protection. An initial group of 39 patients was monitored, out of which 13 felines (33.33%) had no difficulties associated with urethrostomy, and the remaining 26 patients (66.66%) had complications.

Comparing perineal urethrostomy (PU) with prepubic urethrostomy (PPU), this study indicates that 24 patients (61.53% of the total number) had complications listed in Tables 2 and 3 with varying degrees of expression, 2 deaths (5.12%) and complications resulting from changes in the overall condition of the patient were identified.

Postoperatively, through continuous monitoring of patients, we noticed changes in the general condition, including hyperthermia, decreased food intake, vomiting, erythema, and local discomfort. These aspects were noted separately from the local complications of urethrostomy. The infiltration of urine into the peristomal muscle and adipose tissue is a frequently cited complication, most often associated with areas of necrosis or chronic dermatitis. In this study, there were three cases of peristomal dermatitis and one case of subcutaneous urinary infiltration.

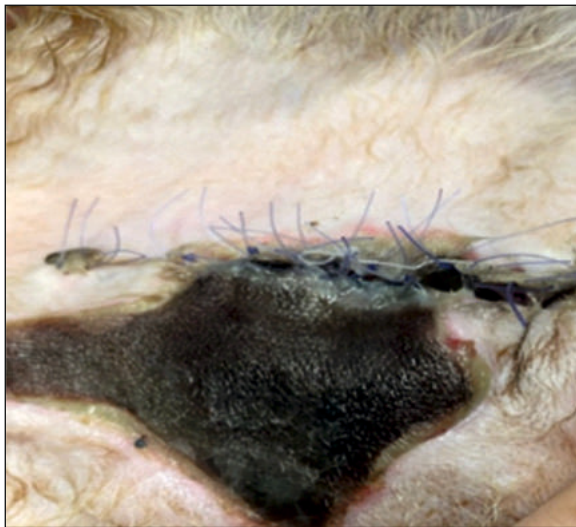


Fig. 2. PPU urethrostomy. A large area of necrotic dermatitis 7 days post-surgery due to urine infiltration in subcutaneous tissue

A group of 26 cases was monitored, in which predominantly short-term haematuria (5 patients), recurrent urethral obstruction (5 patients) and stoma stricture (4 patients) were identified.

A group of 13 long-term felines was monitored in which complications occurred; they were identified

predominantly in the case of prepubic urethrostomy interventions, being present in 11 patients out of the total presented. For them, the most common secondary pathology was bacterial cystitis (4 out of 13 patients, that is, 30.76% of cats monitored for the long term), two felines showed urinary incontinence (15.38%), and obstruction of the stoma was reported in 3 felines (23.07%).

Another important conclusion is that urethrostomy does not treat the underlying pathology that requires surgery; it supports drug treatment.

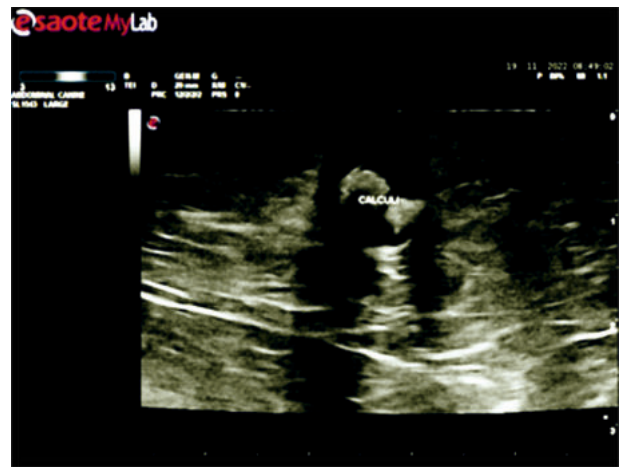


Fig. 3. Ultrasonography in a male cat with PPU. A large stone induces a partial obstruction of the abdominal portion of the urethra

The management of food, body weight, the repetition of urine tests, and the permanent monitoring of urinary pH are important coordinates that cannot be managed only by the medical staff, requiring the active involvement of the owner.

The result of the study took into account the complications arising, the quality of life of the patient, mortality, and also the opinion of the owner.

Following these evaluations, we conclude that the achievement of prepubic urethrostomy in felines imposes significant risks with an increased frequency, most often associated with its position or improper hygiene.

CONCLUSIONS

Although the frequency of postoperative difficulties has increased, urethrostomy remains considered a lifesaving method of the animal practiced in European veterinary clinics.

Indications for the realization of prepubic urethrostomy have been associated with unattainable or failed perineal urethrostomy interventions, severe urethral trauma, obstruction, or stenosis of the pelvic urethra.

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