

A RETROSPECTIVE STUDY ON INDICATIONS AND COMPLICATIONS OF FELINE  
URETHROSTOMY PRESENTED TO UNIVERSITY VETERINARY TEACHING HOSPITAL  
UNIVERSITI MALAYSIA KELANTAN (UVTHUMK) FROM THE YEAR 2017-2021

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## CERTIFICATION

This is to certify that we have read this research paper entitled 'A Retrospective Study on Indications and Complications of Feline Urethrostomy presented to University Veterinary Teaching Hospital Universiti Malaysia Kelantan (UVTHUMK) from the year 2017-2021' by Amal Azwa Binti Che Azuha and in our opinion it is satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the course DVT 5436 - Research Project.



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## DEDICATIONS

I dedicate my dissertation work to my family and my beloved friends. My deepest gratitude goes to my parents, Mr. Che Azuha Bin Ismail and Mrs. Sharifah Binti Ab. Rahman for their moral support and encouragement which without them, the completion of this thesis seems extremely tough.

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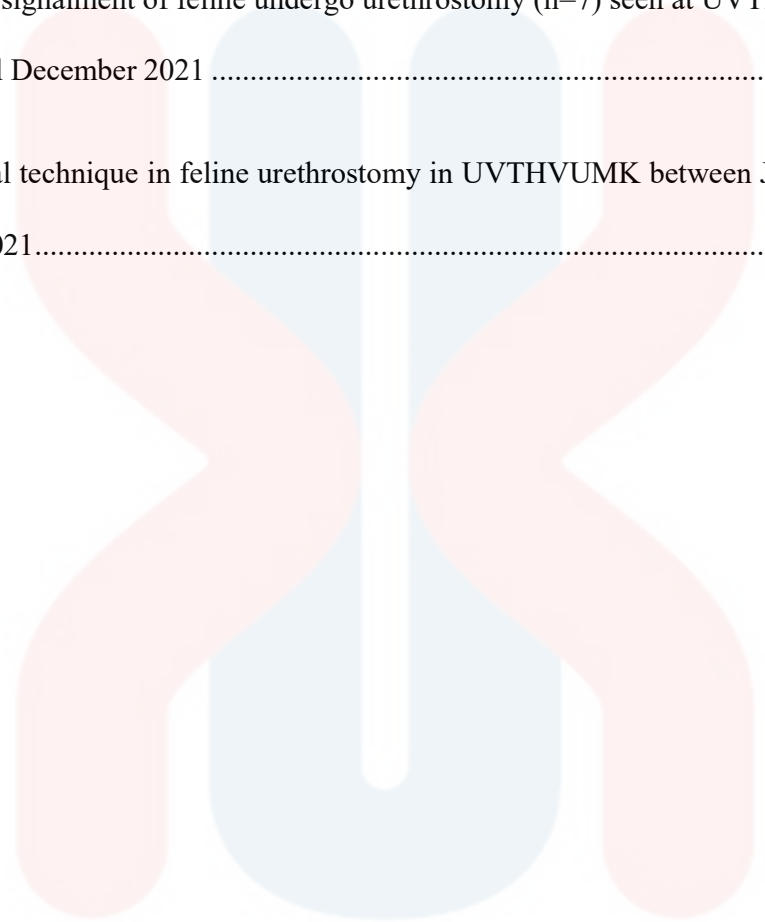
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## ABSTRACT

An abstract of the research paper presented to the Faculty of Veterinary Medicine, Universiti Malaysia Kelantan, in partial requirement on the course DVT 5436 - Research Project.

Urethrostomy is a creation for diversion urine flow near an obstruction, site of constriction, severely damaged, destroyed, or diseased urethra, a permanent stoma is made into the urethra. The study's goals were to assess cat urethrostomy indications and identify post-urethrostomy problems in cats brought to the University Veterinary Teaching Hospital (UVTH), Universiti Malaysia Kelantan. In this study, seven feline urethrostomy instances were found by a retrospective analysis. The UVTHUMK records were used to gather the medical records of all the patients' clinical data, particularly the signalment, clinical presentation, diagnostic investigation, surgical methods, post-complications that happened after urethrostomy, and response to therapy. To determine the need for urethrostomy and post-urethrostomy problems, descriptive analysis was conducted, and the results were given in frequency and percentages. Urolithiasis (14%), urethral stenosis (29%) and urethral rupture (57%), respectively, were the most frequent causes of feline urethrostomies. Urethral strictures (43%), recurrent bacterial UTI (29%), wound dehiscence (14%), and urolithiasis (14%) were among the post-urethrostomy consequences in felines. 57% (4/7) of the felines treated surgically responded well, and 43% (3/7) of the felines' fundamental issues were resolved together with the occurrence of complications. Despite a number of initial problems following urethrostomy, this study demonstrated that cats generally responded well to the procedure.

Keywords: urethrostomy, feline, retrospective study, indications, complications.



## ABSTRAK

Abstrak daripada kertas penyelidikan dikemukakan kepada Fakulti Perubatan Veterinar, Universiti Malaysia Kelantan untuk memenuhi sebahagian daripada keperluan kursus DVT 5436 - Projek Penyelidikan.

Uretrostomi adalah penciptaan stoma kekal ke dalam uretra apabila lencongan aliran air kencing proksimal kepada halangan, tapak penyempitan, rosak teruk, kemusnahan atau berpenyakit uretra diperlukan. Objektif kajian ini adalah untuk menilai tanda-tanda dan hasil uretrostomi dalam kucing dan untuk menentukan kelaziman komplikasi pasca uretrostomi dalam kucing yang dibawa ke Hospital Pengajaran Veterinar Universiti Malaysia Kelantan (HPVUMK). Kajian retrospektif dengan tujuh kes uretrostomi kucing telah dikenal pasti dalam kajian ini. Rekod perubatan semua data klinikal pesakit, terutamanya tanda-tanda klinikal, persembahan klinikal, penyiasatan diagnostik, pendekatan pembedahan, komplikasi berlaku selepas uretrostomi dan tindak balas terhadap rawatan diperolehi daripada rekod HPVUMK. Analisis pemboleh ubah dilakukan untuk mengenal pasti petunjuk dan hasil uretrostomi dan kelaziman komplikasi selepas uretrostomi dijalankan. Tanda-tanda yang paling biasa untuk uretrostomi kucing adalah uretral pecah (57%), diikuti oleh uretral stenosis (29%) dan batu karang (14%). Komplikasi hasil uretrostomi dalam kucing termasuklah uretral sempit (43%), jangkitan kuman saluran kencing yang berulang (29%), luka (14%) dan batu karang yang berulang (14%). Semua 57% (4/7) kucing menunjukkan tindak balas yang baik terhadap rawatan pembedahan, manakala 43% (3/7) kucing mempunyai masalah utama yang diselesaikan dengan berlakunya komplikasi. Kajian ini menunjukkan bahawa tindak balas keseluruhan terhadap uretrostomi pada kucing adalah baik walaupun terdapat komplikasi.

Kata kunci: urethroscopy, kucing, kajian retrospektif, tanda-tanda, komplikasi.

## INTRODUCTION

One of the most typical disorders seen in a clinical environment is feline lower urinary tract disease (FLUTD) (Defauw *et al*, 2011). The symptoms of this condition include dysuria, hematuria, stranguria, pollakiuria, periuria, and altered appetite (Junior *et al*, 2004). Urethral blockage has also been reported in 28.6% of FLUTD cases (Trangerud C *et al*, 2009). Urethrostomy is necessary in cases of recurrent urethral obstruction or when medical treatment is insufficient to clear the obstruction. Foreskin edoema, urethral strictures, penile deformities, urethral tumours, urethral strictures induced by inappropriate urethral catheterization, and iatrogenic urethral disruption are a few examples of these (Williams J, 2009). Urethrostomy is also performed to diminish the risk of urethral obstruction due to recurrent urinary calculi that are not likely to be resolved with medical therapy (Smeak, 2000). Urethral inhibition is a potentially fatal condition due to intraluminal abnormalities similar as urethral entrapments, urethroliths, and tissue was sloughed off, or similar as strictures, seditious lump, tumors, anomalies, dyssynergia and muscular spasm (Luther J. K, 2018). Obstruction or rupture of the urethra proximal to the penile urethra may be managed by primary repair of the urethra, resection and anastomosis of the urethra, or more conservative therapy consisting of urinary diversion via a tube cystostomy, with or without an indwelling catheter. However, some proximal urethral diseases may not be amenable to such management. Permanent urine diversion, such as a prepubic (ante pubic) urethrostomy (PPU) or subpubic urethrostomy, is recommended in certain situations (Baines *et al*, 2001). The purpose of this research is to evaluate indications for urethrostomy in cats and to determine the post-urethrostomy complications in cats presented to University Veterinary Teaching Hospital (UVTH), Universiti Malaysia Kelantan from 2017 to 2021.

## **1.1 Research problem**

There is no statistical data on the indications for urethrostomy and post-operative complications of urethrostomy in University Veterinary Teaching Hospital Universiti Malaysia Kelantan. Owners of the pet are ignorant of the prevalence of feline lower urinary tract disease, which can cause repeated urethral obstructions in which medical treatment is insufficient to clear the obstruction. Moreover, there have been numerous reports of problems with these salvage urinary diversion treatments, including urinary incontinence, urinary tract infections (UTIs), peristomal dermatitis, subcutaneous urine leaks, and stenosis. This is a pilot project that was presented to University Veterinary Teaching Hospital (UVTH), Universiti Malaysia Kelantan to look at the causes of urethrostomies in cats as well as the complications that may arise after one.

## **1.2 Research questions**

1.2.1 What are the indications for urethrostomy in cats?

1.2.2 What are the complications of post-urethrostomy in cats?

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### **1.3 Research hypothesis**

1.3.1 The indications for urethrostomy in the cat are urethral rupture, followed by urethral stenosis and urolithiasis.

1.3.2 The complications of post-urethrostomy in cats are recurrent bacterial urinary tract infection, urethral strictures, urolithiasis and wound dehiscence.

### **1.4 Objectives**

1.4.1 To identify indications for urethrostomy in cats were brought to University Veterinary Teaching Hospital Universiti Malaysia Kelantan (UVTHUMK).

1.4.2 To evaluate the post-urethrostomy complications in cats were brought to University Veterinary Teaching Hospital Universiti Malaysia Kelantan (UVTHUMK).

## 2.0 LITERATURE REVIEW

### 2.1 Surgical technique in urethrostomy

These procedures aim to expand the channel for urine flow by removing the narrow penile urethra and utilising the pelvic or membranous portion of the urethra, which is three to four times larger than the penile urethra. The perineal region is trimmed and made aseptic for surgery, including the four to five cm near the ventral base of the tail. Either dorsal or ventral recumbency is the position of the patient. The patient is placed in a gentle ventral recumbent position over a towel that has been rolled, with the tail fastened over the back and the hindlimbs lightly constricted. In order to carefully avoid the anal sacs, a purse string suture made of 3-0 nylon is inserted around the anus. Castration is done first on an intact cat. To identify the urethra, if possible, the urethra is catheterized. Around the prepuce and scrotum, an elliptic skin incision is created, leaving at least a centimetre of unbroken skin between the anus and the incision (Figure 1A). In order to prevent the skin margins from rolling inward and making contact with the urethra, enough skin is taken from the prepuce and base of the scrotum. Careful blunt dissection of the subcutaneous tissues isolates the penis, ischiocavernosus, and ischiourethralis muscles (see Figure 1B). It is possible to electrocoagulate the cranial and caudal scrotal arteries, however this rarely results in significant bleeding. To reduce bleeding, the ischiocavernosus and ischiourethralis muscles are incised with scissors at their ischial attachments. Incision at the ischial attachments is made easier by lateral penis retractions that tighten these muscles (see Figure 1C). With scissors, the ventral pubic attachment is precisely incised (see Figure 1D).

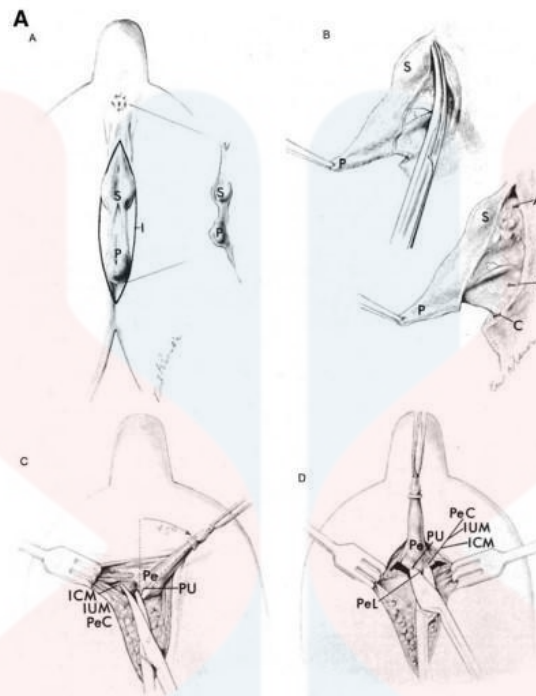


Figure 1(A) shows an elliptical incision that includes the prepuce and scrotum (scrotum, prepuce, and incision). Prepuce and scrotum removal (B) (A: caudal scrotal artery, B: cranial scrotal artery, C: dorsal artery and vein of penis, C: prostatic artery). (C) Dissection of the penis from the surrounding tissue to its pelvic attachments on the ischium (PeC = penis crus; Pe = penis; PU = pelvic urethra). (D) The penile ligament (PeL; short for penis ligament) is cut. The penis and pelvic urethra can be moved and displaced posteriorly by carefully dissecting the penis ventrally and digitally elevating it from the pelvic floor. When there is little to no stress on the incision line, mobilisation is effective. On the dorsal side of the penis, you can see the bulbocavernosus muscle, the retractor penis muscle, and the bulbourethral glands (see Figure 1E). The external anal sphincter muscle is transected near the retractor penis muscle, which is separated from the urethra, and removed (see Figure 1F). With this dissection, care is taken to avoid harming the rectum and pelvic nerves (Figure 2). Iris scissors are used to cut the penile urethra along its dorsal surface, from the tip of the penis to the bulbourethral glands (see Figure 1G). The pelvic urethra is roughly

4 mm in diameter at the level of the bulbourethral glands. After the appropriate level is reached, closed mosquito hemostats can be inserted into the pelvic urethra to its box-locks. Using 4-0 monofilament nylon or polypropylene or 5-0 synthetic absorbable suture material, the incised pelvic urethra and roughly two thirds of the penile urethra are sutured to the skin in an interrupted pattern (see Figure 1H). The penile tissue and residual urethra that are distal to the urethrostomy site are removed (see Figure 1I). Although it is frequently unneeded, an absorbable mattress suture may be inserted into the body of the remaining penile shaft to stop bleeding. The last skin incision has been stitched up. The anus's purses string suture is cut out.

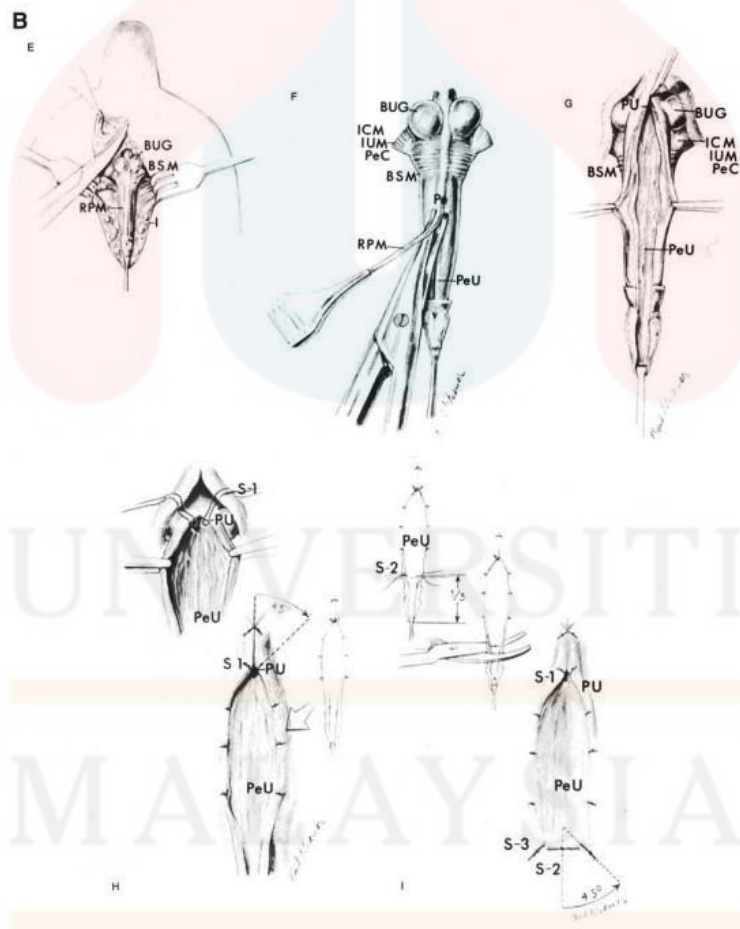




Figure 2 (E) Exposure of the bulbourethral glands, the bulbocavernosus muscle, and the retractor penis muscle (RPM). (F) Penile urethral probe insertion (PeU = penile urethra). (G) The pelvic urethra is reached by cutting the penile urethra through the glans penis. (H) Suture of the perineal skin to the pelvic and penile urethral mucosa (S-1 = first sutures). (I) Inserting a through-and-through suture through the penis's body (S-1 stands for the first suture, S-2 for the mattress suture, and S-3 for the mucosa-to-skin suture) (Smith C.W., 2002).

## 2.2 Surgical indication for performing urethrostomy in cats.

Cats with the prevalent disorder feline lower urinary tract disease (FLUTD) may have urethral blockage that is potentially fatal (Hostutler *et al*, 2005). If urinary catheterization is not an option, urethrostomy is advised for cats that experience recurring obstructive episodes despite medication therapy. Perineal urethrostomy (PU) is the first-line surgical surgery that occurs most frequently (Williams, 2009). The chances of urethral and penile stenosis or injuries rise with multiple urethral de-obstructions. This is one of the main causes of urethrostomy. Postoperative urethral ostium stenosis, a significant urethrostomy complication, is another frequent surgical rationale for performing perineal urethrostomy (PU) and prepubic urethrostomy (PPU). According to reports, there is a greater chance of stoma stricture following PU than following PPU. This might be because the perineal urethra has a diameter that is four times smaller than that of the prepubic area. (Reginaldo, 2009). As a result of the growing usage of manufactured diets that lower urine pH and limit magnesium content to prevent the formation of struvite crystalluria, struvite urolith incidence has decreased, whereas calcium oxalate urolith incidence has grown (Osborne *et al*, 2000).

A component of feline lower urinary tract disease is urethral plug formation with obstruction, especially in male cats. Without proper medical and dietary management, urethral obstruction may



ensue. Obstructions that cannot be relieved by catheterization or recurrent urethral obstructions can be managed by perineal urethrostomy. It must be emphasized that perineal urethrostomy is only an adjunct to medical management of cats with recurrent or persistent urethral plug formation. Fortunately, with medical and dietary management and with a high level of owner compliance, the need for perineal urethrostomy in patients with lower urinary tract disease has decreased. Urethral strictures may occur with chronic urethritis or repeated trauma from catheterization. Likewise, perineal urethrostomy is indicated if the stricture is within the penile urethra. If the location of the obstruction is unknown, contrast radiography may be necessary. Other urethral trauma or neoplasia may damage the urethra, requiring a perineal urethrostomy (Charles W. Smith, 2002).

## 2.2 Post-urethrostomy complications in cats

Urinary incontinence, peristomal dermatitis, or urine scalding are all possible side effects of urethrostomies, particularly prepubic urethrostomies (Eayrs & Moores, 2020). to assess the urethrostomy's long-term side effects, including chronic peristomal dermatitis. The changing placement of the urethral ostium in the skin may help to explain this. Urine may leak into nearby tissue during micturition. In one PPU case, incontinence of the urinary system was noted. This has been noted in the past as a frequent PPU consequence due to the increased risk of vascular and neurological damage (Reginaldo P.S., 2009).

Post urethrostomy, urinary incontinence is a known consequence (Eayrs *et al*, 2020). According to some theories, incontinence is brought on by nerve injury from surgery or a shorter urethra (Mendham *et al*, 2001). Continence is said to be highly correlated with membranous urethral length (Mungovan *et al*, 2017). Comparing the external urethral sphincter of cats to that of dogs,

morphometric examination of the urethra indicated a higher amount of striated muscle and fibroelastic tissue in the external urethral sphincter (Cullen *et al*, 2000). When necessary and carried out correctly, perineal urethrostomies in cats are advantageous to the patient, satisfying for the surgeon, and fraught with few problems. Hemorrhage from erectile tissue, wound dehiscence, cystitis or ascending urinary tract infection, urethral stricture, urine and faecal incontinence, perineal hernia, and rectourethral fistula are complications that have been documented after perineal urethrostomy (Charles W. Smith, 2002).

Although it can happen, cavernous tissue bleeding rarely causes major issues. Some haemorrhage is predicted because the urethra is encircled by cavernous tissue. The majority of bleeding from the penile cavernous tissue is typically prevented by precise urethral positioning in relation to the skin. Hemorrhage from the ischiocavernosus and ischiourethralis muscles can be prevented by carefully incising the muscles at their ischial attachment. When the bulbospongiosus muscle is cut, some bleeding happens, but it rarely causes trouble. When Elizabethan collars are not used or are removed by the patient, licking of the surgical site may result in severe bleeding. To sustain urine output when bleeding occurs, thorough cleansing of the urethral stoma is advised (Charles W. Smith, 2002).

Despite it being a rare complication, urine leakage into the perineal tissue can cause cellulitis and wound dehiscence. A closed indwelling catheter system and soft tissue urine drainage are required for severe urine leakage into the caudal thigh and perineum (Scavelli TD, 2002). This issue can be avoided by properly positioning the urethra next to the skin and avoiding urethra laceration. Gentle tissue handling and avoiding strain on the suture line prevent urethral and cutaneous necrosis. The mucosa is more vulnerable to tearing by tissue forceps and suture material when it has been

traumatised by repeated catheterization, an indwelling catheter, or uroliths. During a few days, an indwelling soft Foley catheter can be required.

### **3.0 MATERIAL AND METHODS**

#### **3.1 Study area**

The study is carried out at the University Veterinary Teaching Hospital Universiti Malaysia Kelantan (UVTHUMK) which is located at UMK Bachok Campus. All the pet owners are come from many districts especially from Bachok, Kota Bharu and Besut. Equipments that available in the hospital include X-ray and ultrasound.

#### **3.2 Study design**

Cats that undergo Urethrostomy surgery during January 2017 to December 2021 from University Veterinary Teaching Hospital Universiti Malaysia Kelantan (UVTHUMK) were recovered from the case files, data collection form and computerized patient medical record system- Kreloses.

Data on the date of issuing invoice for Urethrostomy, age, breed and origin were extracted. Client complaints, clinical signs and physical examination findings were also obtained. Total number of Feline Lower Urinary Tract Disease (FLUTD) patients visited during the study period was obtained from the computed database.

### 3.3 Inclusion and exclusion criteria

Based on the inclusion criteria, there were only seven cases included in the study. 243 cases were excluded from the study in which they were having FLUTD problems but did not undergo urethrostomy. All the seven cases undergo perineal or transpelvic urethrostomy. The surgeries were successfully, and all the procedures are recorded and obtained from UVTHUMK medical record from 2017 until 2021.

Cases included in the study were based on the following definition:

- The cases must from UVTHUMK
- The cases were charged for 'Urethrostomy' in the invoice
- The cases must have fundamental database such as breed, ages and their origins.

## 4.0 RESULTS

A total of 250 cases were quoted for Feline Lower Urinary Tract Disease (FLUTD) and seven cases underwent urethrostomy in UVTHUMK from January 2017 to December 2021.

### 4.1 Indication for feline urethrostomy

The percentage of feline urethrostomy in UVTHUMK was calculated as the percentage of the total feline urethrostomy cases visited from year 2017 until 2021. The highest indications for feline urethrostomy is urethral rupture 57% (4/7), follow with urethral stenosis 29% (2/7) and the lowest indication is urolithiasis 14% (1/7) based on figure 4.1.

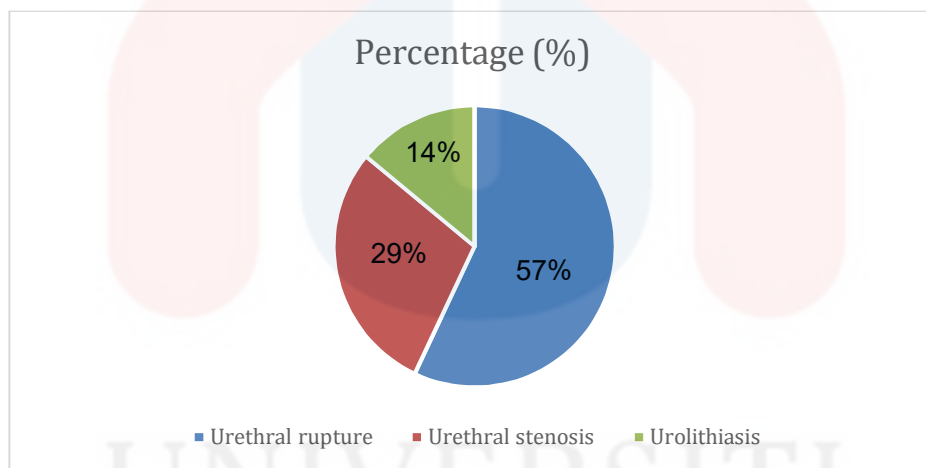


Figure 4.1: Indication for feline urethrostomy in UVTHVUMK between January 2017 until December 2021

#### 4.2 Patient signalments of feline urethrostomy

Patient signalments of feline urethrotomy cases are collected from UVTHUMK and summarize in Table 4.1. In urethral rupture patients, there are two cats within one to two years and another two cats are three to four years old. Three out of four cats are males and one is female cat. Three cats are domestic short hair cats and one is Persian cat for the breed. In urethral stenosis, one cat is within one to two years and another one cat is within two to three years old. All cats are males and the breed are domestic short hair cats. In urolithiasis patient, the age is within three to four years, the sex is a male and the breed is domestic short hair cat.

	Age				Sex		Breed	
	1-2 years	3-4 years	5-6 years	>7 years	Male	Female	Domestic Short Hair	Domestic Long Hair
Urethral rupture (n=4)	2	2	0	0	3	1	3	1
Urethral stenosis (n=2)	1	1	0	0	2	0	2	0
Urolithiasis (n=1)	0	1	0	0	1	0	1	0

Table 4.1: Patient signalments of feline undergo urethrostomy (n=7) seen at UVTHVUMK

between January 2017 until December 2021

### 4.3 Clinical signs in feline urethrostomy

Based on the figure 4.2, the cats that undergo urethrostomy shows clinical signs which urethral obstruction 40% (4/7) on the top, the second highest goes to hematuria 30% (3/7), then dysuria 10% (2/7), pollakiuria 10% (2/7), stranguria 5% (1/7) and pyuria 5% (1/7). The clinical signs data is obtained from physical examination medical data in UVTHUMK.

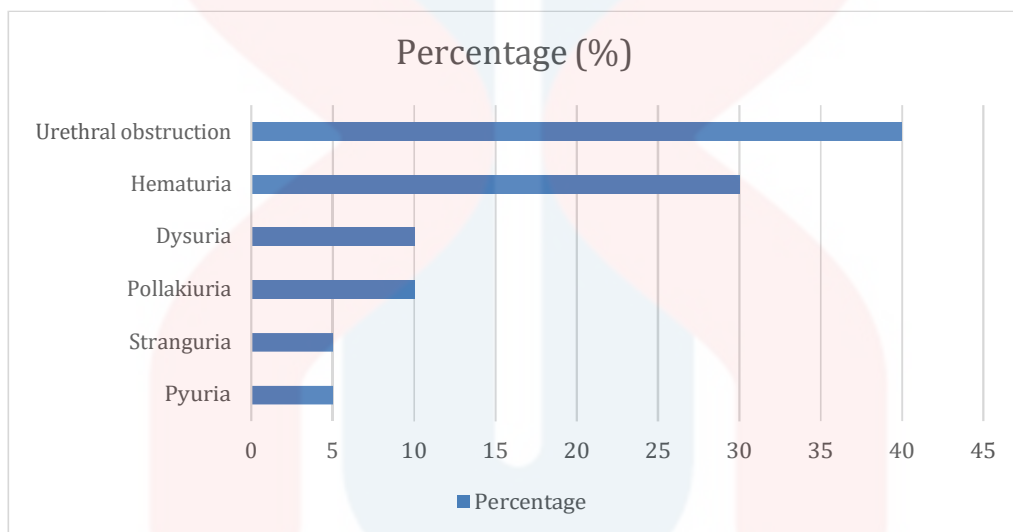


Figure 4.2: Percentage of clinical signs in feline urethrostomy in UVTHVUMK between January 2017 until December 2021

#### 4.4 Surgical technique in feline urethrostomy

There are two surgical techniques for feline urethrostomy which are perineal and trans pelvic urethrotomy that perform by different surgeon in UVTHUMK. All six patients undergo transpelvic urethrostomy and only one patient that has urethral rupture undergo perineal urethrostomy.

	Perineal urethrostomy	Trans pelvic urethrostomy
Urethral rupture (n=4)	1	3
Urethral stenosis (n=2)	0	2
Urolithiasis (n=1)	0	1

Table 4.2: Surgical technique in feline urethrostomy in UVTHVUMK between January 2017 until December 2021



#### 4.5 Complications in feline post-urethrostomy

Complications of feline post-urethrostomy was taken from data in UVTHUMK. Majority of complications in feline urethrostomy is urethral strictures 43% (3/7), next recurrent bacterial urinary tract 29% (2/7) and 14% (1/7) for both wound dehiscence and urolithiasis cases.

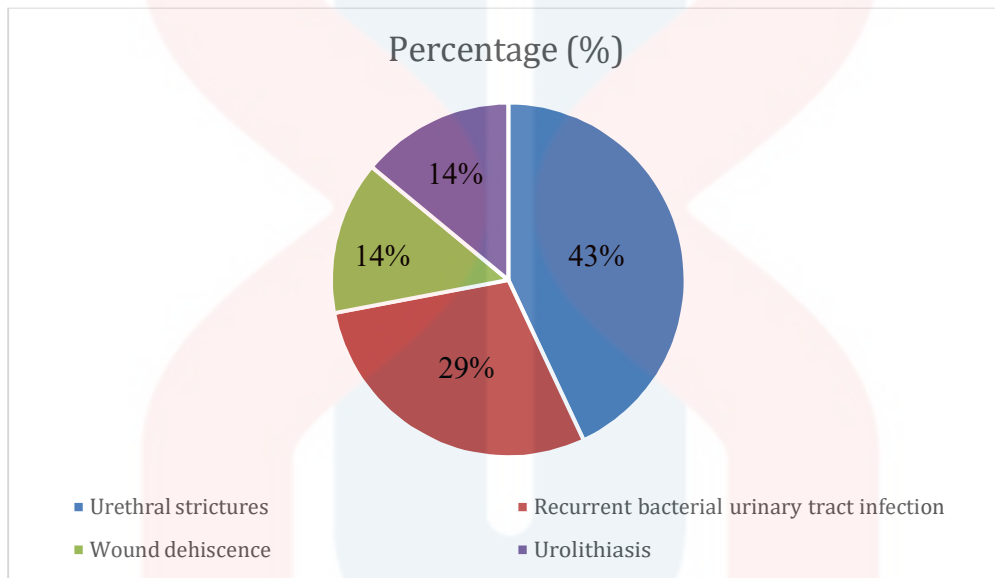


Figure 4.3: Percentage of feline post-urethrostomy complications at UVTHVUMK between January 2017 until December 2021

## 5.0 DISCUSSION

### 5.1 Indications for urethrostomy in feline

In cats deemed potential candidates for perineal urethrotomy, signalling and preoperative clinical symptoms were similar to those previously described (Griffin *et al*, 2000). The frequency of different uroliths was in line with stated values for the time period of the study (Osborne, 2000). In the present study, urethral rupture is the most indications for feline urethrostomy with 57%, follow by urethral stenosis 29% and urolithiasis 14%. In the majority of preoperative histories of patients who underwent perineal urethrostomy and transpelvic urethrostomy, the number of obstructive FLUTD episodes and numerous urethral catheterizations were frequent. The most effective treatment option is still indwelling urethral catheterization (Seitz M *et al*, 2018). The risk of urethral and penile stenosis or injuries is increased by multiple urethral de-obstructions. This is one of the main causes of urethrostomy (Bass M *et al*, 2005).

In dogs and cats, urethral rupture happens occasionally (Anderson *et al*, 2006). Urethral rupture can be divided into three types based on where it occurs: pre-, intra-, and post-pelvic (Addison *et al*, 2014). Clinical symptoms are influenced by the lesion's location, size, and duration. Urine retention and buildup in the peritoneal cavity or retroperitoneal space as well as more serious systemic effects and concomitant metabolic disorders might result from injury to the proximal urethra (Boothe, 2000). In small animals, urethral injuries can result from surgery, catheterization, urinary calculi or plugs, or external trauma (Anderson *et al*, 2006). Traumatic injuries (observed or suspected vehicular trauma) were noted as the most frequent cause of urethral injuries, similar to this patient which had a history of a vehicle accident (Addison *et al*, 2014).

Strictures are defined as a circumscribed narrowing or stenosis of a hollow structure, usually consisting of cicatricial contracture (Stedman *et al*, 2000). The most common causes of urethral stenosis include cancer, pelvic trauma, acute inflammation, or surgical intervention (McLoughlin *et al*, 2011). Based on the case history and signalment, as well as the absence of trauma, urethral catheterization, or surgical intervention before presentation, stricture formation was assumed to be of congenital origin. Also, the existence of the membrane structure dividing the two cavities raises the possibility of a congenital origin. The urethral mucosa was thought to be the source of the membrane. It has been reported that a dog with partial urethral obstruction also had a similar result, which was thought to be congenital in nature (Lechner *et al*, 2011).

Urolithiasis has been reported in 15% to 23% of all cats with diseases of the lower urinary tract, and 22% to 50% of those uroliths are composed of struvite (Hostutler *et al*, 2005). Approximately 15% to 23% of feline lower urinary tract disease cases are caused by urolithiasis, 11% by anatomic defects, and 1% to 8% by urinary tract infections (Buffington *et al*, 2005). In cats older than 10 years, 46% of lower urinary tract disease cases are related to infection and 17% to concurrent infection and calculi (Bartges *et al*, 2001).

In the nutshell, urethral rupture, urethral stenosis and urolithiasis are the common indications for urethrostomy in cats. This can be due to congenital problem, history of vehicular accident and traumatic injuries.

## 5.2 Complications of urethrostomy in feline

Urolithiasis (14%), wound dehiscence (14%), recurrent bacterial urinary tract infection (29%), and urethral strictures (43%), among others, have all been reported as problems. 25% and 28% of cats, respectively, would experience early and late problems following feline urethrostomy, with early

difficulties defined as happening less than 4 weeks postoperatively and late complications defined as occurring more than 4 months after the procedure (Bass *et al*, 2000) case study. A common postoperative complication that has been documented in up to 43% of instances is urethral stricture. The documented intervals between surgery and stricture formation range from less than one week to more than 4.5 years, with 12% of cases occurring during the first 4 weeks postoperatively and 5% at 16 weeks (Smith *et al*, 2001).

Indwelling urinary catheters, trauma, poor surgical technique, and inexperienced surgeons have all been linked to urethral strictures. The mucocutaneous junction is where strictures most frequently occur. Excessive granulation tissue production may result from inflammation brought on by catheter-induced irritation, surgery, or trauma (self-inflicted or external). Incomplete mobilisation of the urethra and excessive tension on sutures result from inadequate dissection of the urethra cranial to the bulbourethral glands due to insufficient ventral dissection or absence of transection of the ischiocavernosus muscle. Edematous urethral tissue or incorrect surgical technique may be to blame for the poor apposition of mucosa and skin. There were 4 to 1623 days between the initial perineal urethrostomy and the onset of the stricture. Eight of the nine cats included in the follow-up, according to a case study, experienced no problems after the surgical revision. One cat started licking and urinating inappropriately at the stoma location (Philipps *et al*, 2004). Revision surgery, which entails appropriate dissection and mobilisation of the urethra to just cranial to the bulbourethral glands, should be carried out in the case of stricture. Other procedures, such as prepubic, subpubic, or transpelvic urethrostomies, may be considered if dissection of the urethra is unable to ensure tension-free closure.

The most typical late surgical consequence is recurrent urinary tract infection. Urinary tract infections can be self-restricting and subclinical, as well as medical. An underlying uropathy,

trauma from insufficient or repeated catheterization, and modifications to the urinary system's natural anti-infective defences are all proposed as contributory factors to urinary tract infections. Recurrent urinary tract infections were discovered following urethrostomy in healthy cats than those with FLUTD in 22% of the latter group and not in the healthy group. This indicates that perineal urethrostomy may increase the risk of infections in cats who already have uropathy, but the operation itself does not (Griffin D, 2000).

Ascending bacterial contamination may be made easier by changes in the urethra's width and length, neuropraxia, or injury to the striated muscle urethral sphincter that results in lower intraurethral pressure. urethral pressures and electromyographic activity of the urethralis muscle decreased after surgery; only 39% of the cats had these changes sustain at long-term follow-up (Gregory *et al*, 2004). This study might draw the conclusion that the increased occurrence of infections postoperatively cannot be solely attributed to impaired urethral sphincter function. It was suggested that avoiding dissection dorsal to the urethra may be more crucial to maintaining lower urinary tract function than dissection in a later study comparing sharp versus blunt dissection during perineal urethrostomy. This study did not find a significant difference between the preoperative and postoperative urodynamic status of patients in either group. Because of the risks for bacterial urinary tract infections, proper surgical technique and accurate identification of anatomy may help to avoid iatrogenic trauma, and indwelling catheters are not advised in the postoperative period, the diameter of the lumbococcygeal vertebral canal was determined in dorsal versus ventral recumbency to investigate other potential causes of neuropraxia. The risk of urinary tract infection has led to recommendations for urinalysis and bacterial culture at 1, 3, and 12 months after surgery. A Foley catheter may need to be inserted for 2 to 3 days until the mucocutaneous junction seals in cats with subcutaneous urine extravasation after surgery, despite

the fact that having a urethral catheter in place after surgery has been linked to an increased incidence of postoperative stricture formation (Tobias K. M, 2007).

After trans pelvic urethrotomies, cats have been known to develop struvite and calcium oxalate urolithiasis. (Bass *et al*, 2000) discovered that 13% of 59 cats who had perineal urethrostomy later developed urolithiasis. Stones removed from the urinary tract should be sent for analysis to ascertain the composition, as proper treatment and prevention rely on the type of stone. Struvite stones may or may not be caused by an infection, although they frequently go away with a calculolytic diet and, if necessary, medications. The removal of calcium oxalate stones requires surgery or urohydropulsion, and those who have them should be put on a prescription diet to prevent stone recurrence. Stone analysis has revealed a significant drop in the proportion of struvite urolithiasis and subsequent rise in calcium oxalate since the frequent usage of calculolytic diets was introduced. These acidifying diets have been proposed as a risk factor for the development of calcium oxalate stones in addition to lowering the proportion of struvite urolithiasis. Increased water consumption is advised as a preventative measure regardless of the mineral makeup of the stone to lessen the risk of urolith development.

Poor adhesion, urine extravasation, or infection can all lead to wound dehiscence. Open wound care should be given to dehisced incisions. Iatrogenic or faecal pollution can cause infection. Only one (2%) of 59 cats studied by (Bass *et al*, 2000) experienced urine extravasation, wound dehiscence, and cellulitis. Furthermore, dehiscence was shown to occur 3% of the time (Smith *et al*, 2001).

A successful long-term functional outcome can be achieved with urethrostomy, particularly when it is accompanied with effective medical therapy of the underlying cause. Urinary tract infections

and strictures are the most frequent long-term surgical consequences. These illnesses are frequently curable. Assuming that euthanasia would be chosen soon after surgery if it led to a poor quality of life, (Ruda *et al*, 2011) examined the cause of death and survival times of cats after perineal urethrostomy. Sixty percent of cat survivors were asymptomatic six months after surgery, and 87% of cats lived at least six months. Re-obstruction, sepsis, multi-systemic illness, and return of FLUTD were among the factors that contributed to the 13% of cats that passed away within the first six months following surgery. 88% of cat owners reported having a good postoperative quality of life. Similar findings were made by (Bass *et al*, 2000), finding that 89% of cat owners said their cat had a very excellent standard of living despite the fact that more than half of the cats required long-term medical care owing to difficulties or disease recurrence. The fact that 73% of the cats in this retrospective analysis who died or were put to sleep did so for conditions unrelated to the urinary tract is notable.



## **6.0 CONCLUSION**

When medical care of feline urethral blockage is ineffective, urethrostomy is a salvage operation that may be used. The procedure's objective is to eliminate clogs that could be fatal. The most frequent cause of problems is urethral stricture, which is typically brought on by an underlying uropathy, and bacterial urinary tract infections, which are the most frequently reported indications.

## **7.0 RECOMMENDATION**

The investigation revealed that urethrostomy is an important prerequisite for cats that having problem in urinary tract. On this basis, all medical data should be in complete form such as the patient signalment, diagnosis and treatment. Thus, future research needs to make sure all the data are complete because every detail can influence all the results and discussions for a better investigation.



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