

Intrapelvic Urethral Anastomosis in a Dog with Complete Obstruction of Proximal Membranous Urethra

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Abstract : A 4.65 kg 13-month-old male Pekingese dog was referred to veterinary teaching hospital of Konkuk University for evaluation of dysuria. On physical examination, severe distention of urinary bladder was found in abdominal palpation. Urinary catheter could not be guided into urinary bladder. On serum biochemistry, blood urea nitrogen (35.6 mg/dl) and creatinine (1.9 mg/dl) were increased. Obstruction part of proximal membranous urethra was founded on urethrogram. The length (13 mm) of obstruction part was callipered by cystourethrogram and urethrogram on operation. Surgical resection of obstruction part of urethra was performed without pubic osteotomy, and anastomosis was performed with 5-0 polyglycolic acid. Omentum was placed around the urethral anastomosis. On first day after surgery, appetite was good. On day 5, complete blood count and serum biochemistry showed normal range but mild urinary incontinence was showed after removing catheter. On day 7, urinalysis showed normal condition. On day 14, no leakage of surgical site was observed in excretory urogram. On day 21, no more urinary incontinence and good micturition were found. On 1 year later, the patient showed healthy condition without recurrence.

Key words : urethral obstruction, urethral anastomosis, dog.

Introduction

Anatomical outlet obstruction is the most common cause of urethral obstruction in dogs (1). Urethral obstruction is caused by urolith, neoplasia, prostatic disease, trauma, stricture, surgery, and extraluminal compression (3,5,6,9,10,12). Complete urethral obstruction is an emergency condition, and failure of urinary elimination results in uremia and death within a few days (6,9). Therefore, rapid diagnosis of obstruction and alleviation is very important to prevent loss of contractile function of urinary bladder. In treatment of anatomical urethral obstruction, surgical management is preferred. Surgical method consists of urethrotomy, urethrostomy, anastomosis, and replacement of urethra using synthetic materials (4-6,8).

In this case, complete obstruction of membranous urethra was managed by anastomosis without pubic osteotomy approaching at caudal ventral midline abdomen.

Case

History and physical findings

A 4.65 kg 13-month-old male Pekingese dog was referred to veterinary teaching hospital of Konkuk University for evaluation of dysuria. The patient had a history of dysuria and anorexia. The patient had urolithiasis 2 months ago and 2

calculi in urethra were flushed into urinary bladder at local animal hospital. On physical examination, severe distention of urinary bladder was palpated in abdomen. Latex urinary catheter could not be guided into urinary bladder. On rectal palpation examination for calculus and prostatic gland, nothing remarkable was found.

Hematological and serological findings

A complete blood count (CBC) showed mild leukocytosis $20.1 \times 10^3/\text{dl}$ (reference range: 6-17). On serum biochemistry, increased concentration of BUN 35.6 mg/dl (reference range: 4.8-31.4), creatinine 1.9 mg/dl (reference range: 0.2-1.6), and ALP 737 U/L (reference range: 0-142) and decreased concentration of ALB 2.6 g/dl (reference range: 2.6-3.9) were noted.

Radiological and ultrasonographic findings

Distended urinary bladder was found and calculus in urethra or urinary bladder was not found. Abdominal organs were displaced cranially. Complete stenosis in proximal membranous urethra and dilated membranous urethra were found on urethrogram (Fig 1). On the ultrasonographic view, prostatic gland was normal shape and size.

Urinalysis

Blood 250 ery/ μl , positive protein, positive nitrogen, positive leukocyte, pH 6, and S.G 1.015 were showed.

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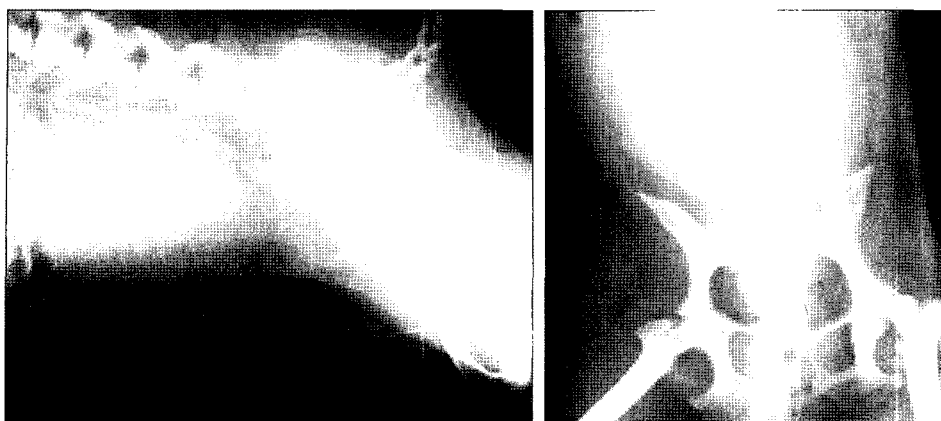


Fig 1. Urethrogram. Contrast medium was accumulated caudal to dilated urinary bladder at lateral and ventrodorsal views.

Surgical treatment

Pretreatment and anesthesia

Before surgery the patient was medicated with cefradine (Cefradine inj[®], Korea Schnell Pharma. Co., Ltd, Korea, 30 mg/kg, IV), atropine sulfate (Atropine sulfate[®], Je Il Pharm. Co., Ltd, Korea, 0.02 mg/kg, SC), and butorphanol (Butorphan[®], Myung Moon Pharma. Co., Ltd, 0.4 mg/kg, IV). Anesthesia was induced with thiopental sodium (Pentotal sodium 0.5gr.inj[®], Choong Wae Pharm. Corp., Korea, 8 mg/kg, IV). Isoflurane (Rhodia Orgranique Fine Ltd., Korea, 0.5%–2.5%) was used for maintenance with 100% oxygen (1–2 L/min).

Surgical technique

Latex urinary catheter was placed from bulb of urethra to obstruction part. Obstruction part of urethra was approached at a caudal ventral midline abdomen without pubic osteotomy. Urine was drained by cystocentesis. Urinary bladder and membranous urethra were retracted cranially. Stiff and blackish obstruction part was exposed just behind prostatic gland (Fig 2). Cystotomy was performed for catheterization. Cystourethrogram and urethrogram from both directions of urinary bladder and urethra were performed for measuring the length of obstruction part under fluoroscopy (Fig 3). Obstruction part was 13 mm. It was excised with surgical scissors (Fig 4a). Catheter in urethra was guided to urinary bladder (Fig 4b). Urethral ends were stay sutured with simple interrupted pattern at 12, 4, and 8 o'clock positions (Fig 4c). End of sutures was left long for helping urethral anastomosis. Anastomosis of urethra was performed with 5-0 polyglycolic acid (Safil[®]) (Fig 4d). Omentum was placed around the urethral anastomosis. Urinary bladder was sutured with Cushing and Lembert pattern. Abdominal muscle and skin were sutured with routine method.

Postoperative care and evaluation

Transurethral latex catheter was placed to drain urine for 5 days. Cefradine (Cefradine inj[®], Korea Schnell Pharma. Co., Ltd, Korea, 30 mg/kg, IV), carprofen (Rimadyl[®], pfizer. Co., Ltd, USA, 2.2 mg/kg, BID, PO), and silymarin (Silymarin[®], Shi-

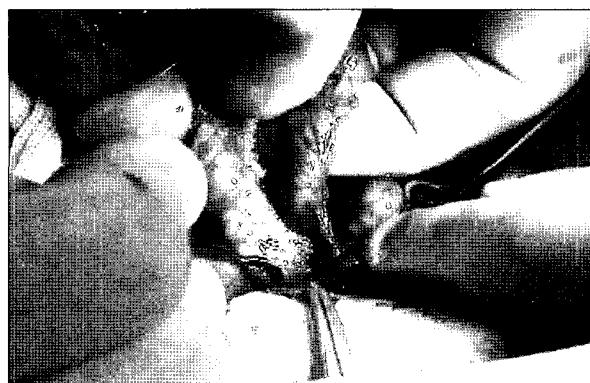


Fig 2. Stiff and blackish obstruction part was exposed just behind prostatic gland.



Fig 3. Cystourethrogram and urethrogram from both directions of urinary bladder and urethra were performed for measuring the length (13 mm) of obstruction part under fluoroscopy.

nil Pharm. Co., Ltd, Korea, 3 mg/kg, bid, PO) were medicated for 7 days. Dysuria and anorexia including abnormalities of CBC, serum biochemistry, and urinalysis were monitored. On first day after surgery, appetite was good. On day 5, CBC and serum biochemistry showed normal range but mild urinary

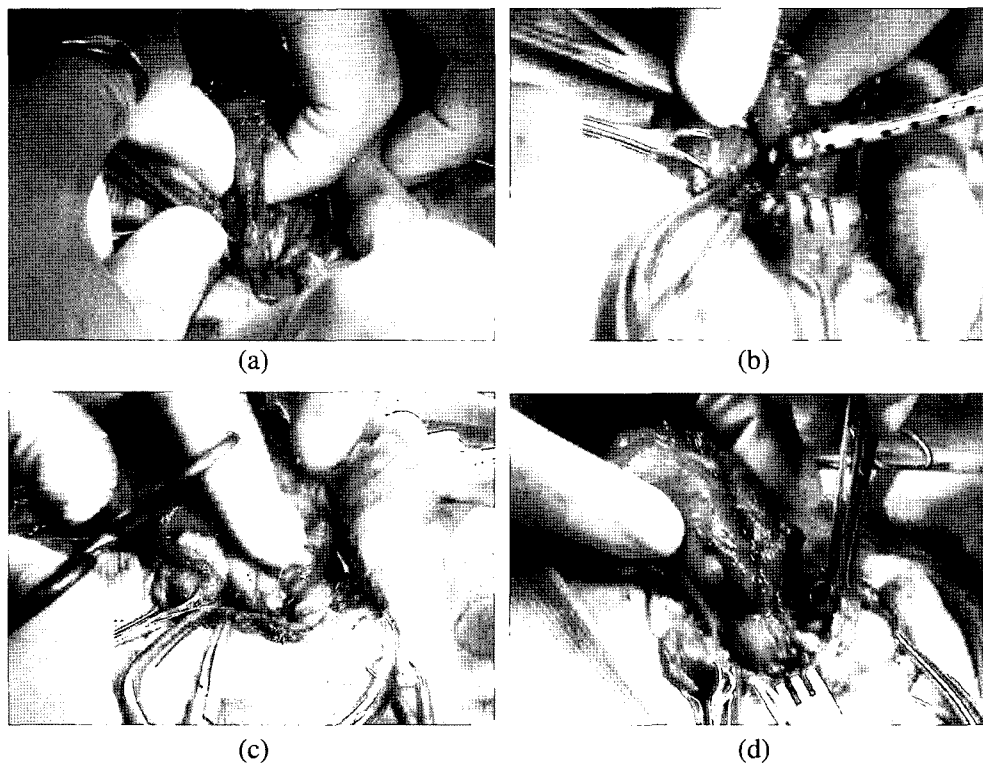


Fig 4. Urethral anastomosis. Obstruction part was excised (a); catheter in urethra was guided in urinary bladder (b); Urethral ends were stay sutured with simple interrupted pattern at 12, 4, and 8 o'clock positions (c); view after finishing suture (d).

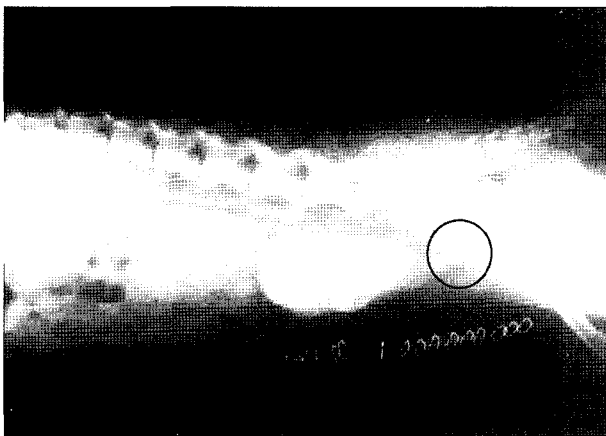


Fig 5. On day 14, no leakage on site (circle) of urethral anastomosis was confirmed by excretory urogram.

incontinence was showed after removing catheter. On day 7, urinalysis showed normal condition. On day 14, no leakage of surgical site was observed in excretory urogram (Fig 5). On day 21, no more urinary incontinence and good micturition were found. On 1 year later, the patient showed normal healthy condition without recurrence.

Discussion

The urethra may be damaged by the trauma of blunt or

penetrating injuries or could be damaged during catheterization (7). Urethral stricture is the most common complication of urethral trauma (5). In present case, the patient had urolithiasis and 2 jack-shaped struvites in membranous urethra were hardly flushed into urinary bladder 2 months ago at local animal hospital. Moreover, he had gonadectomy 5 months ago. Gonadectomy may effect on urinary function in male dogs. Obstruction in the patient might have been complicated by urethral trauma with compulsory catheterization and decrease of sexual hormone. Dysuria was found after cystotomy and urethral stricture was confirmed by urethrogram. Balloon dilation was applied to stricture part, but it was failed to recovery. Finally, stricture led to obstruction.

On surgery, length of obstruction part was measured by cystourethrogram and urethrogram from both directions of urinary bladder and urethra under fluoroscopy. It helped to differentiate intact urethra from obstructed urethra. It was important for prevention of recurrence after anastomosis. Generally, pubic osteotomy is performed on surgery of membranous urethra. However, in this case, surgery was taken without pubic osteotomy because obstruction part was just behind prostatic gland (2,11). Catheterization from membranous urethra to urinary bladder after resection of obstruction part helped to maintain urethral anastomosis by easily finding membranous urethra that shrank back after resection of obstruction part. On urethral anastomosis, stay sutures were performed at 12, 4, and 8 o'clock positions and the end of suture material

was left long to aid rotation of urethra so that dorsal part of urethra could be easily sutured. Severity of urinary incontinence was decreased without medication, so urinary incontinence during 21 days after surgery was inferred by decrease of bladder contractility caused by distended bladder.

Conclusion

A 4.65 kg 13-month-old male Pekingese dog presented with dysuria. The length (13 mm) of obstruction at proximal membranous urethra was measured by cystourethrogram and urethrogram. Urethral anastomosis without pubic osteotomy was performed. After surgery, dysuria was disappeared and no leakage was confirmed by urethrogram on 14th day after surgery. On 1 year later, the patient showed normal urination.

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막성요도 근위부 완전폐쇄를 지닌 개에서 골반내 요도문합술

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요 약 : 체중 4.65kg, 나이 13 개월의 수컷 페키니즈 견이 무뇨 증상으로 건국대학교 수의과대학 부속 동물병원에 내원하였다. 신체 검사상에서 복부 촉진을 통해 심각한 방광 팽창을 확인 하였다. 방광 내 요도 카테터 삽입을 시도 하였으나 실패 하였다. 혈액 화학 검사에서 BUN 농도(35.6 mg/dl)와 크레아티닌농도(1.9 mg/dl)가 각각 상승된 것으로 나타났다. 단순 방사선 및 요도조영술에서 심한 방광팽창 및 막성 요도의 시작 부분이 폐쇄된 소견을 보였다. 수술동안 투시기를 이용 방광요도조영술과 요도조영술을 동시에 실시하여 본 바 폐쇄 부분의 길이가 13 mm임을 확인하였다. 골반강내 위치한 요도 폐쇄 부위가 피부절개선상까지 견인으로 노출이 가능하여 치골절골술 없이도 요도절제 및 요도문합을 실시할 수 있었다. 요도를 5-0 polyglycolic acid로 문합하고 이 부위를 대망막으로 감쌌다. 수술 후 첫째 날, 식욕이 회복 되었고, 5일 째 비정상 범위를 보였던 혈청 화학 수치들이 정상을 보였다. 그러나 요도 카테터를 제거한 후 약간의 요실금이 관찰 되었다. 7일 째 뇨 분석 결과가 정상 수치를 나타냈고, 14일 째 배설성 요로 조영술을 통해 수술 부위에 소변 누수가 없음을 확인 하였다. 21일 째, 더 이상의 요실금이 확인 되지 않았으며, 1년이 지난 현재 재발 없이 정상적인 배뇨와 건강한 상태를 확인할 수 있었다.

주요어 : 요도 폐쇄, 요도 문합, 개