

Bilateral Ectopic Ureters of a Dog: the First Clinical Trial of a Surgical Method by Extension of Ureteral Stoma in the Bladder Neck

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개의 양측성 요관이소증: 방광목개구부 확장술의 첫 임상시도

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요 약 : 난소를 제거한 57개월령의 golden retriever개가 심한 배뇨실금을 나타내며 양측성 요관이소증으로, 좌측에는 통상적인 새요관개구술(neoureterostomy)로 방광삼각지대에 새로운 요관개구부를 만들었고 방광목에 위치한 우측요관의 개구부는 그 부위를 확장만 시킴으로써 수술 후 배뇨실금 증상을 교정할 수 있었다. 방광목확장개구수술방법은 본 증례에서 처음으로 개에 시도되어 좋은 수술결과를 나타내었고 요관개구부가 방광목인 이소증 치료에 효과가 있을 것으로 생각되며 지속적인 임상적용과 관찰이 요구된다.

Key words : ureteral ectopia, ureteral stoma, bladder neck, dog

Introduction

Ectopic ureter is a congenital disorder which could be either bilateral or unilateral¹³ and intramural or extramural⁵. The ureter normally enters the mucous of urinary bladder, terminates into the trigone of the bladder, and forms a stoma. When the ureter opens its stoma into the vagina (70%), urethra (12%), neck of the bladder (8%), and uterus (3%)¹², it is ureteral ectopia. When the ureter doesn't enter the cystic mucous and terminates directly into the abnormal site, it is extramural ectopic ureter.

To correct the ectopia, two surgical techniques are described by Holt²: a stomatization technique for the correction of intramural ectopic ureter and a tunnel technique^{5,7} for the extramural ectopia.

In this case of the bilateral intramural ectopic ureters, the common stomatization technique called

neoureterostomy¹ was carried out in the left ureteral stoma. A new surgical method was performed in the right ureter by an enlargement of the ectopic stoma at the bladder neck.

Case

Anamnesis

A spayed female golden retriever dog, at the age of 57 months, was presented to the small animal clinic in the Veterinary School of Hanover, Germany with a severe continual urinary incontinence. Like the other reports^{6,7,13}, there was wet hair around the vagina.

At 12 months old, the dog was already examined because of a urinary incontinence. An ectopic ureter was diagnosed by urography. Since the incontinence was controlled from time to time, the owner did not want to have her operated at that time.

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During the last two months before her latest visit to the clinic, the incontinence was getting worse.

Clinical Findings

An intravenous urography was taken with 1g of the contrast medium Omnipaque® (Iohexol, Schering, Germany). In the radiography, hydronephrosis and hydroureter, which are common complications of incontinence^{4,8,10}, were not found. The left ureter was found to be an ectopic, not opening into a cystic trigone. The right ureter seemed to open into the bladder. When the bladder is filled completely by a contrast, the terminal site of the ureter is difficult to identify in the radiograph^{8,13}. That is specially true with an intramural ectopic ureter.

By the palpation, the abdomen was normal. A complete blood chemistry and urinalysis were carried out with ECG. All the results were normal except alkalic urine with pH 8.

Surgical Treatment

The dog weighed 29 kg and was preanesthetized with Polamivet® (Levomethadon, Hoechst, Germany) and Valium® (diazepam, Roche, Germany). The anesthesia was maintained by Isoflurane.

The skin and the linea alba were incised in the caudal midline. When the bladder was exposed out of the abdomen, the dorsal part was examined. The left intramural ectopia was easily verified. The left ureter entered the dorsal mucosa of the bladder, came out of the mucosa and opened into the caudal part of the urethra. The right ureter entered into the dorsal mucosa of the bladder and was not seen afterwards. After the ventral cystotomy, the opening of the right intramural ureter was found in the neck of the bladder.

The left ectopia was corrected firstly by the method of neoureterostomy. The neoureterostomy was not performed for the right ureter ectopia. Instead, the extension of ureteral stoma in the bladder neck was carried out for the first time as shown in Fig 1 and Fig 2.

A feeding tube 7.5×2.1 mm (Fa Braun, Nelsungen, FRG) was inserted into the right ureter opening in the bladder neck and lifted up to facilitate the cutting of cystic mucosa and its underlining ureter. About 5 mm of the incision was made from the



Fig 1. Left ureteral stoma after the neoureterostomy with a feeding tube inserted.

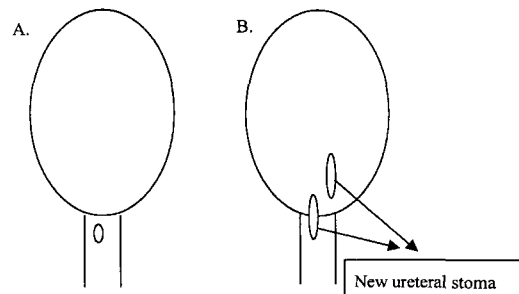


Fig 2. Diagram of the ureteral stoma made in the right and the left ureters (A: before surgery, B: after operation).

opening of the ectopic ureter toward the cystic trigone to enlarge the stoma. The ureteral mucosa was sutured to the bladder mucosa by PDSII® 6-0 USP (polydioxanone, Ethicon, USA) in a simple interrupted pattern.

In the left ectopic ureter, neoureterostomy was carried out according to a standard surgical method^{1,5}. The intramural lining of the left ectopic ureter was enlarged and recognized by applying pressure to the caudal extramural part of ureter. Then, the cystic trigonal mucosa just above the enlarged ureteral lining was cut about 5 mm. The intramural ureter appeared in the trigonal incision line and was lifted up into the trigonal opening. A stay suture was placed in this ureter by PDSII®. The ureteral mucosa was cut and another feeding tube was inserted. The urethra-opening ectopia was ligated extramurally by a non-absorbable suture material in two places about 3 cm apart. The oblique opened edge of ureteral mucosa was sutured to the mucosa of the cystic trigone by PDSII in the simple interrupted pattern.

The feeding tubes were removed from both sides. The ventral bladder was closed by simple continuous two layer sutures with Vicryl® 4/0 (polyglactin 910, Ethicon). The abdomen was flushed with the warmed sterile normal saline and suctioned. The linea alba was closed with Vicryl® 3/0. The skin is sutured with Suturamid® 2/0 FSL (polyamide, Ethicon) in a simple interrupted manner. On the top of the skin suture, a sterile gauze was packed and attached to the skin by 5 stay sutures.

After surgery, Baytril® (Enrofloxacin, Bayer) and Buscopan were injected. To correct the alkalic urine, NH₄Cl was provided.

Discussion

As an unilateral ectopia could fill the bladder with enough volume of urine to control urination^{2,9,12}, the bilateral ectopic ureters of this case were able to perform an intermittent stable emiction at the early age. And that, a hypothesis could be made that the bilateral ectopic ureters, with the one opening into the bladder neck, may have the ability to fill the bladder with urine in the sufficient volume to control uresis. With aging, the incontinence seemed to become more severe and continual as this case because it was not surgically corrected early.

An intramural ectopic ureter with its termination into the neck of bladder was difficult to visualize only by the radiography and can be easily misinterpreted as a normal ureter like the right ureter of this case. Therefore, both sites of the ureteral terminations must be examined after cystotomy, even in the case of unilateral ectopic diagnosis.

The feeding tube was used here as a guideline to cut and enlarge the ureteral stoma. At the same time, it was also acting as a drainage to keep the surgical area sterile from the constantly dribbling urine of the ureteral stoma.

The ureteral mucosa was incised obliquely to make a large opening in order to prevent a strictural narrowing of the new stoma which would cause a post-operative incontinence as one of the possible complications^{3,4,11}

Conclusion

On the next day after the operation, the urination was very frequent on a stroll, but seemed controlled. On the fourth day, the frequency of urination was decreased significantly during the promenade. On the tenth day, the dog had the full control of normal urination. The microbiological results of urine culturing were negative.

Combining neoureterostomy with an extension of ureteral stoma in the bladder neck was highly rewarding in this bilateral ectopic ureteral case with no more signs of urinary incontinence.

We recommend to try this new method for correcting the ectopic ureter of cystic neck-opening either in the bilateral or unilateral cases and to observe the surgical results.

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