

Desmopressin as an Alternative Solution for Urinary Leakage After Ureterocaliceal Surgeries

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Introduction: Persistent urine leakage is common following iatrogenic urinary collecting system injuries. Management of a urine leak usually includes manipulations such as catheter drainage, ureteral stenting, and percutaneous nephrostomy placement. The aim of this study was investigation the potential beneficial effect of desmopressin in reduction of urinary leakage duration.

Materials and Methods: Fifteen patients with incisional urinary leakage were enrolled in this study. They had undergone pyeloplasty (n = 9), pyelolithotomy (n = 4), and ureterocaliceal anastomosis (n = 1). All of them had ureteral stenting or nephrostomy catheters, and urinary leakage had lasted for at least 15 days. Seven patients received desmopressin spray, 1 puff, twice a day, from the 16th days of urinary leakage, and 8 patients (control group) did not receive any medical treatment. The duration of urinary leakage was compared between the two groups.

Results: The patients were 5 women and 10 men with the median age of 37 years (range, 26 to 58 years). None of the patients had urinary obstruction. There were no significant differences in age and sex distribution between the two groups. The mean urinary leakage duration was 28.7 ± 7.2 days in the patients of desmopressin group and 47.7 ± 8.8 days in those of the control group ($P = .04$).

Conclusion: Our study showed that desmopressin can reduce the duration of incisional urinary leakage. We conclude that patients with prolonged urinary leakage after pyelocaliceal surgery who does not respond to surgical urinary drainage may benefit from desmopressin.

Keywords: postoperative complications, urinary leakage, desmopressin

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INTRODUCTION

Urine leakage and urinoma result from disruption of the urinary collecting system at any level from the calyx to the urethra. Persistent urine leakage is common following iatrogenic injuries.^(1,2) Management of urine leakage usually involves some manipulations such as catheter drainage, ureteral stenting, and percutaneous nephrostomy placement with open repair versus nephrectomy reserved for persistent leakage.⁽¹⁾ However, to

our knowledge, the efficacy of medical therapy in urinary leakage have not been described before. We speculated that decrease in urinary output can help improvement of urinary leakage. In order to examine this hypothesis, we used desmopressin, which has antidiuretic effects and can reduce urinary output. Herein, we report our preliminary experience of the effect of desmopressin in reduction of urinary leakage duration following urological surgeries.

MATERIALS AND METHODS

We prospectively studied on 16 patients with incisional urinary leakage documented by antegrade pyelography or follow-up nephrostography between 2000 and 2008. Our inclusion criteria were ureteral stenting or nephrostomy catheters and the minimum urinary leakage duration of 15 days. The eligible participants provided written consent to be enrolled in the study after they were informed of the study protocol. Creatinine levels of incisional excretions were more than 10 mg/dL in all patients. All stents and catheters were from a same company and all of the patients had received a first-generation cephalosporin as a prophylactic antibiotic.

The patients were assigned into 2 groups alternatively, 15 days after the operation. We gave an opportunity of these 15 days for healing of sutures. Eight patients received desmopressin acetate spray (Minirin nasal spray, Ferring Pharmaceuticals, New South Wales, Australia), 1 puff, twice a day, starting from the 16th days of urinary leakage diagnosis. Daily check of serum sodium and potassium levels were performed. Patients in the control group underwent watchful waiting management after performing sufficient urinary drainage. The drains discontinued when their output was less than 30 mL/d.

The urinary leakage duration was compared between the two groups. All continuous parameters are expressed as mean \pm standard deviation. Comparisons between groups were performed using the Fisher exact test and the McNemar test. Significant *P* value was considered to be less than .05.

RESULTS

Sixteen patients were included in the study, but 1 in the desmopressin group was excluded during our study, because of flushing and hyponatremia. The patients who were finally analyzed were 5 women and 10 men with the median age of 37 years (range, 26 to 58 years). All of them were shown to have urine leakage by creatinine level measurements. None of the patients had urinary obstruction. There were no significant differences

Demographic and Surgical Characteristics of Patients Treated With Desmopressin and Controls*

Characteristics	Desmopressin Group	Control Group
Number of patients	7	8
Age, y	43.3 \pm 7.5	40.0 \pm 6.3
Males	5 (71.4)	5 (62.5)
Operation type		
Pyeloplasty	4 (57.1)	5 (62.5)
Pyelolithotomy	2 (28.6)	2 (25.0)
Ureterocaliceal anastomosis	1 (14.3)	0
Duration of urinary leakage, d	28.7 \pm 7.2	47.7 \pm 8.8

*Values in parentheses are percents.

in age and sex distribution between the two groups. The patients' characteristics are shown in the Table.

The mean urinary leakage duration was 28.7 \pm 7.2 days in the patients of desmopressin group and 47.7 \pm 8.8 days in those of the control group (median, 26 days and 44 days, respectively; *P* = .04). All of the patients were discharged with good condition and re-operation was not performed for any of them.

DISCUSSION

Vasopressin is a nonapeptide with a disulphide bridge between its two cysteine residues. The gene for vasopressin is situated on chromosome 20, not far from the gene for oxytocin. Vasopressin is synthesized as a large prohormone, which is called preprovasopressin. This prohormone is synthesized principally by the magnocellular neurons of the paraventricular and supraoptic nuclei in the hypothalamus.⁽³⁾ Desmopressin is a synthetic analogue of arginine vasopressin, which is commercially available since 1974. This drug is proven effective for the treatment of nocturnal enuresis, central diabetes insipidus, and some coagulopathies.⁽⁴⁻¹²⁾ A contra-indication for use of desmopressin is severe allergic reaction. The drug should discontinue if allergic reaction, anaphylaxis, and water toxicity are induced. One of our patients developed flushing and hyponatremia, which led to his withdrawal from the study group.

The antidiuresis induced by desmopressin is more potent than that of arginine vasopressin, resulting in an increased urine osmolality and a

decreased urine output. Cimentepe and colleagues reported a patient with prolonged urinary drainage after percutaneous nephrolithotomy who had not responded to insertion of a double pig-tail stent. They showed that treatment with oral desmopressin could reduce urinary leakage.⁽¹³⁾ In the present study, we benefited from the antidiuretic effect of desmopressin in the management of urinary leakage after pyelocaliceal operations in a limited number of patients. We used desmopressin in patients who did not respond to surgical procedures of urinary drainage. Our study showed desmopressin can reduce the duration of urinary leakage in these patients. Although the number of patients in each arm of the study was not enough to make a definite conclusion, reducing the duration of urinary leakage (up to nearly 40%) was considerable.

CONCLUSION

The use of desmopressin may improve the beneficial effect of other procedures such as catheter drainage, ureteral stenting, and percutaneous nephrostomy placement for incisional urinary leakage. Thus, patients with prolonged urinary leakage after pyelocaliceal surgeries who do not respond to surgical urinary drainage can benefit from desmopressin. However, our study had limitations such as a small sample, and larger sample sizes can help to test more accurately the effect of diuretics on incisional urinary leakage. This study can be considered as a clue to the use of antidiuretic therapy in the management of postoperative urinary leakage.

CONFLICT OF INTEREST

None declared.

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