# Interpreting the Voiding Diary of Patients with Lower Urinary Tract Symptoms

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## INTRODUCTION

Lower urinary tract symptoms (LUTS) are subjective complaints. Patients usually have both storage and voiding symptoms and recall may be inaccurate. In order to realize the true voiding condition during daily life, a voiding diary that records daily water intake, voiding frequency, the voided volume of each void, the occurrence of urgency and the occurrence of urgency urinary incontinence (UUI) is an important and objective tool that can be used to assess LUTS in patients seeking the diagnosis and treatment of their bladder or voiding condition. However, a good voiding diary needs careful instruction by the physician or study nurse so that the patient records accurately. A voiding diary covering three days is considered necessary to measure these conditions in a way that truly reflect daily life [1].

The important parameters recorded in a voiding diary should include: (1) urinary frequency during the day and night with all voids recorded, (2) functional bladder capacity, the largest volume recorded in the voiding diary, day or night, (3) most frequently observed bladder volume, which may reflect the usual voided volume or the most frequent bladder sensation with respect to voiding desire, (4) urgency or UUI episodes in which the urgency discomfort sensation that the patient feels usually cannot be deferred, (5) the volume of water drunk, (6) nocturnal urine output and daily output, with the nocturnal urine output consisting of all voids after sleep and including the early morning void [2] and (7) associated bladder pain episodes where there is any discomfort associated with bladder filling or voiding.

The followings are ten common LUTS complaints and their possible interpretation based on the recorded voiding diary. The suggested management rationale and treatment modalities are also included for each case presentation to provide the reader with a reference point. Only one day voiding diary is presented in this article because of page limitations.

## CASE 1: FREQUENCY DUE TO POLYDIPSIA

### *Case presentation*

A 65 year-old man had diabetes mellitus (DM) and had been under oral hypoglycemic treatment for 3 years. His father had history of chronic renal failure and bladder cancer. The patient had complained of frequency and occasional urgency for 1 year, nocturia three times per night, no UUI and no dysuria. He had been treated with detrusitol for 2 weeks but without success (Table 1).

**Table 1.** Frequency Due to Polydipsia

| 請記錄您從上午06:00到隔天上午05:59的排尿情況，由上到下依序填寫。 | | | | |
|---|---|---|---|---|
| 時間 | 尿急(√) | 尿失禁(√) | 排尿(√) | 排尿量(mL) |
| 06:05 | √ | | √ | 500 |
| 08:55 | | | √ | 210 |
| 10:25 | | | √ | 400 |
| 12:05 | √ | | √ | 500 |
| 13:42 | | | √ | 410 |
| 15:03 | √ | | √ | 480 |
| 16:30 | √ | | √ | 500 |
| 17:41 | √ | | √ | 350 |
| 19:38 | | | √ | 250 |
| 21:40 | √ | | √ | 560 |
| 22:11 | | | √ | 150 |
| 00:15 | √ | | √ | 570 |
| 03:12 | √ | | √ | 600 |

### *Interpretation and management*

Increased voiding frequency is likely to be due to excessive fluid intake because he is afraid of renal failure or bladder cancer. The voiding diary shows an adequate voided volume, no nocturia, and urgency only occurs at the bladder capacity. Restricting fluid intake is the best way to manage his frequent urination. The recorded intake is important when recognizing the cause of frequency.

## CASE 2: FREQUENCY AND NOCTURIA DUE TO OVERACTIVE BLADDER

### *Case presentation*

A 37 year-old housewife, who denied DM or hypertension, had a history involving an abdominal hysterectomy due to myoma uteri at age 32 and anti-incontinence surgery for stress urinary incontinence (SUI) 2 years ago. She complained of frequency nocturia that was associated with urgency and UUI for 1 year; there was no dysuria and no SUI. The maximum flow rate (Qmax) was 36 mL/s, the voided volume was 230 mL, and the post-void residual (PVR) was 35 mL (Table 2).

### *Interpretation and management*

The voiding diary shows increased voiding frequency during both daytime and night time with a small voided volume (functional bladder capacity). The presence of urgency indicates overactive bladder (OAB) and the presence of UUI indicates detrusor overactivity (DO). However,

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**Table 2.** Frequency and Nocturia Due to Overactive Bladder (OAB)

| 請記錄您從上午06:00到隔天上午05:59的排尿情況，由上到下依序填寫。 | | | | |
|---|---|---|---|---|
| 時間 | 尿急(√) | 尿失禁(√) | 排尿(√) | 排尿量(mL) |
| 06:24 | | | √ | 160 |
| 06:45 | | | √ | 100 |
| 08:05 | √ | √ | √ | 250 |
| 09:50 | √ | √ | √ | 300 |
| 10:37 | | | √ | 170 |
| 12:10 | | | √ | 100 |
| 12:52 | √ | √ | √ | 200 |
| 13:22 | √ | | √ | 200 |
| 15:30 | | | √ | 100 |
| 17:15 | √ | | √ | 230 |
| 19:16 | √ | | √ | 200 |
| 21:23 | √ | | √ | 220 |
| 22:30 | √ | | √ | 290 |
| 04:22 | √ | | √ | 450 |

**Table 3.** Frequency Due to Anxiety without Decreased Bladder Capacity

| 請記錄您從上午06:00到隔天上午05:59的排尿情況，由上到下依序填寫。 | | | | |
|---|---|---|---|---|
| 時間 | 尿急(√) | 尿失禁(√) | 排尿(√) | 排尿量(mL) |
| 10:00 | | | √ | 130 |
| 10:45 | | | √ | 230 |
| 11:15 | | | √ | 210 |
| 12:05 | | | √ | 260 |
| 13;15 | | | √ | 190 |
| 14:30 | | | √ | 420 |
| 16:10 | | | √ | 490 |
| 17:50 | | | √ | 70 |
| 21:15 | | | √ | 190 |
| 23:05 | | | √ | 420 |
| 00:05 | | | √ | 500 |
| 01:30 | | | √ | 450 |
| 06:05 | | | √ | 120 |

no nocturnal polyuria was noted in her voiding diary. A high Qmax almost always indicates no bladder outlet obstruction (BOO), but not absolutely. Restricting fluid intake is a life style modification that helps patients with OAB and DO. Antimuscarinics are also helpful for OAB. A detailed urological examination that will be able to exclude possible BOO is important because anti-incontinence surgery may induce iatrogenic BOO.

## CASE 3: FREQUENCY DUE TO ANXIETY WITHOUT DECREASED BLADDER CAPACITY

### *Case presentation*

A 47 year-old woman denied DM, hypertension, or previous pelvic surgery. She was a laborer at a market in the morning hours. She had complained of frequency for 6 months, nocturia once per night; however, there was no urgency and no dysuria. The Qmax was 24 mL/s, the voided volume was 480 mL and PVR was 10 mL. She had been treated with detrusitol for 2 weeks but without success (Table 3).

### *Interpretation and management*

The voiding diary revealed increased frequency and a small functional bladder capacity that occurred only in the morning. There was no urgency and no UUI. A normal voided volume was found for the afternoon hours, possibly after adequate hydration. There is also no nocturnal polyuria. Anxiety during the working hours is likely to be the cause of her increased daytime frequency and an anti-anxiety agent might be helpful to relieve any anxiety. Bladder retraining during the daytime by education may also be helpful. Antimuscarinics play no role in the treatment of this frequency, which is psychological in origin.

## CASE 4: NOCTURIA DUE TO INSOMNIA

### *Case presentation*

A 45 year-old man denied systemic medical disease or previous surgery. He had nocturia 4-5 times each night, but there was no daytime frequency, no urgency, no UUI and no dysuria ever noted. He had been treated with imipramine for 2 weeks but without success. (Table 4)

### *Interpretation and management*

The voiding diary reveals normal frequency and a normal voided volume during daytime. There is no urgency and no UUI. However, there was increased nocturnal frequency and at night time the voided volume was noted to be small. No nocturnal polyuria based on the calculated nocturnal voided volume was found. The nocturia is likely to be caused by a sleep disorder. Restricting the patient's fluid intake before bedtime might be helpful because the nocturnal volume is over 500 mL. Hypnotics before bed time to treat his insomnia might also be prescribed and improve the nocturia.

## CASE 5: NOCTURNAL POLYURIA WITHOUT OVERACTIVE BLADDER

### *Case presentation*

A 74 year-old man had mild DM and had been under oral hypoglycemic treatment for 3 years. He had complained of nocturia without daytime frequency for 3 year; there was no urgency, no dysuria and no UUI noted. He had a history of transurethral resection for an enlarged prostate (TURP) 5 years ago due to LUTS and his noturia had been treated with detrusitol at bed time for 2 weeks but without success (Table 5).

### *Interpretation and management*

The voiding diary reveals a normal daytime frequency and a normal voided volume during the night. There was no urgency and no UUI. However, an increased nocturnal frequency and an increased total nocturnal voided volume were obvious. The nocturnal voided volume was over 33% of the total daily urine output. Nocturnal polyuria is likely to be the cause of his nocturia [3]. Water restriction is necessary before bed time. Desmopressin (DDAVP) might be added before bedtime to increase the serum vasopressin concentration and reduce the nocturnal polyuria [4].

## CASE 6: NOCTURNAL POLYURIA AND OVERACTIVE BLADDER

### *Case presentation*

**Table 4.** Nocturia Due to Insomnia

| 排 尿 記 錄 單 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 姓名：郭 XX | | | | | | | | | | | | | | |
| 日期(第一天)：2 月 2 日 | | | | | 日期(第二天)：2 月 3 日 | | | | | 日期(第三天)：2 月 4 日 | | | | |
| 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 |
| 7-8 | 220 | 400 | | | 7-8 | 200 | 300 | | | 7-8 | 150 | 300 | | |
| 8-9 | | | | | 8-9 | 100 | | | | 8-9 | 200 | | | |
| 9-10 | 300 | | | | 9-10 | | | | | 9-10 | | 300 | | |
| 10-11 | | | | | 10-11 | | 300 | | | 10-11 | | | | |
| 11-12 | | 500 | | | 11-12 | 350 | | | | 11-12 | 250 | | | |
| 12-1 | 400 | | | | 12-1 | | | | | 12-1 | | | | |
| 1-2 | | | | | 1-2 | 200 | 500 | | | 1-2 | 350 | 250 | | |
| 2-3 | 350 | 500 | | | 2-3 | | | | | 2-3 | | 300 | | |
| 3-4 | | | | | 3-4 | | | | | 3-4 | 500 | | | |
| 4-5 | | | | | 4-5 | 350 | | | | 4-5 | | | | |
| 5-6 | 250 | 400 | | | 5-6 | | | | | 5-6 | | 250 | | |
| 6-7 | | | | | 6-7 | | 450 | | | 6-7 | 200 | | | |
| 7-8 | | | | | 7-8 | | | | | 7-8 | | | | |
| 8-9 | | 250 | | | 8-9 | 400 | | | | 8-9 | 100 | | | |
| 9-10 | 300 | | | | 9-10 | | 200 | | | 9-10 | 300 | 100 | | |
| 10-11 | | | | | 10-11 | | | | | 10-11 | | | | |
| 11-12 | | | | | 11-12 | | | | | 11-12 | | | | |
| 睡眠期間 | 200<br>150<br>110<br>80<br>90 | | | | 睡眠期間 | 150<br>80<br>130<br>120<br>50 | | | | 睡眠期間 | 200<br>80<br>120<br>100 | | | |

**Table 5.** Nocturnal Polyuria without Overactive Bladder (OAB)

| 排 尿 記 錄 單 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 姓名：施 XX | | | | | | | | | | | | | | |
| 日期(第一天)：8 月 29 日 | | | | | 日期(第二天)：8 月 30 日 | | | | | 日期(第三天)：8 月 31 日 | | | | |
| 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 |
| 7-8 | | 300 | | | 7-8 | | 300 | | | 7-8 | | 300 | | |
| 8-9 | | 300 | | | 8-9 | 100 | 300 | | | 8-9 | | 300 | | |
| 9-10 | | | | | 9-10 | | 300 | | | 9-10 | | | | |
| 10-11 | | 300 | | | 10-11 | | | | | 10-11 | | | | |
| 11-12 | 100 | 300 | | | 11-12 | | 100 | | | 11-12 | 200 | | | |
| 12-1 | | 300 | | | 12-1 | | 300 | | | 12-1 | | 500 | | |
| 1-2 | | | | | 1-2 | 100 | | | | 1-2 | 100 | | | |
| 2-3 | 200 | | | | 2-3 | | | | | 2-3 | | | | |
| 3-4 | | 300 | | | 3-4 | | | | | 3-4 | | | | |
| 4-5 | | | | | 4-5 | | | | | 4-5 | | | | |
| 5-6 | | | | | 5-6 | | | | | 5-6 | | 300 | | |
| 6-7 | 200 | 300 | | | 6-7 | | 300 | | | 6-7 | 100 | | | |
| 7-8 | | | | | 7-8 | 200 | 100 | | | 7-8 | | | | |
| 8-9 | 100 | | | | 8-9 | | | | | 8-9 | 100 | 300 | | |
| 9-10 | | | | | 9-10 | | | | | 9-10 | | | | |
| 10-11 | | | | | 10-11 | | | | | 10-11 | | | | |
| 11-12 | | | | | 11-12 | | | | | 11-12 | | | | |
| 睡眠期間 | 700<br>600<br>500<br>150 | 4 次 | | | 睡眠期間 | 500<br>400 | 2 次 | | | 睡眠期間 | 200<br>900<br>350 | 3 次 | | |

A 67 year-old man had DM, gout, and hyperlipidemia and had been under regular treatment for more than 5 years. He had complained of daytime frequency for more than one year, nocturia up to 3 times per night with urgency and no UUI; he also complained of mild dysuria and a slow stream. The total prostate volume (TPV) was 35 mL, the transition zone index (TZI) was 0.2, the Qmax was 13 mL/s, the voided volume was 230 mL, and the PVR was10 mL. He had been treated with doxazosin for 3 months but without success (Table 6).

*Interpretation and management*

The voiding diary revealed increased daytime and night time frequency with a small functional bladder capacity in daytime. The presence of urgency, which indicates an OAB, can be found in the diary. The nocturnal voided volume is also greater than 33% of the daily total urine volume, indicating that there was nocturnal polyuria. Both OAB and nocturnal polyuria are present in this patient. The treatment strategy should include adding antimuscarinics and DDAVP to his treatment regimen. Restricting water intake before sleep is also necessary and possible BOO should be investigated in this patient by a pressure flow study.

## CASE 7: INCREASED BLADDER SENSATION WITHOUT OVERACTIVE BLADDER

*Case presentation*

This patient was a 23 year-old women who works in a supermarket and had no medical disease. She had complained of frequency and a small voided volume for more than one year. There was no nocturia, no urgency and no dysuria; furthermore, no bladder pain at full bladder was noted. The Qmax was 15 mL/s, the voided volume was 210 mL and PVR was 0 mL. She had been treated with detrusitol for 2 weeks but without success (Table 7).

*Interpretation and management*

The voiding diary revealed increased daytime frequency with a small voided volume. However, no urgency, UUI and nocturia were found in the diary. Interstitial cystitis/painful bladder syndrome (IC/PBS) is not very much likely because the patient did not complain of bladder pain; however to be cautious, these should be suspected. In these circumstances, it is important to further check the patient's water intake and output balance. If she drinks little water each day, the frequency is possible due to highly concentrated urine. We would advise her to increase her daytime hydration to dilute the urine produced. No

**Table 7.** Increased Bladder Sensation without Overactive Bladder (OAB)

| 請記錄您從上午06:00到隔天上午05:59的排尿情況，由上到下依序填寫。 | | | | |
|---|---|---|---|---|
| 時間 | 尿急(√) | 尿失禁(√) | 排尿(√) | 排尿量(mL) |
| 07:00 | | | √ | 200 |
| 10:00 | | | √ | 150 |
| 12:20 | | | √ | 200 |
| 14:00 | | | √ | 150 |
| 15:00 | | | √ | 200 |
| 17:00 | | | √ | 80 |
| 19:00 | | | √ | 200 |
| 20:30 | | | √ | 220 |
| 23:30 | | | √ | 200 |
| 03:00 | | | √ | 180 |

**Table 6.** Nocturnal Polyuria and Overactive Bladder (OAB)

| 排 尿 記 錄 單 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 姓名：連 XX | | | | | | | | | | | | | | |
| 日期(第一天)：8 月 19 日 | | | | | 日期(第二天)：8 月 20 日 | | | | | 日期(第三天)：8 月 21 日 | | | | |
| 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 |
| 7-8 | | 1000 | | | 7-8 | 100 | 1200 | | | 7-8 | | 900 | | |
| 8-9 | 200 | | √ | | 8-9 | | | | | 8-9 | 220 | | | |
| 9-10 | 200 | | | | 9-10 | 200 | | √ | | 9-10 | 200 | 150 | | |
| 10-11 | | 100 | | | 10-11 | 100 | 150 | | | 10-11 | | | | |
| 11-12 | 100 | | √ | | 11-12 | | 150 | | | 11-12 | 200 | | √ | |
| 12-1 | 100 | 200 | | | 12-1 | 150 | 300 | | | 12-1 | | 200 | | |
| 1-2 | | 150 | | | 1-2 | | | | | 1-2 | | | | |
| 2-3 | 150 | | | | 2-3 | | 200 | | | 2-3 | 200 | 200 | | |
| 3-4 | | | | | 3-4 | 120 | | √ | | 3-4 | | | | |
| 4-5 | 100 | 150 | √ | | 4-5 | | | | | 4-5 | 120 | | √ | |
| 5-6 | | 100 | | | 5-6 | 120 | | | | 5-6 | | | | |
| 6-7 | 100 | 150 | | | 6-7 | | 300 | | | 6-7 | 100 | 300 | | |
| 7-8 | | | | | 7-8 | | | | | 7-8 | | 150 | | |
| 8-9 | | 300 | | | 8-9 | 230 | | √ | | 8-9 | 200 | | | |
| 9-10 | 200 | 100 | | | 9-10 | | 200 | | | 9-10 | 100 | 150 | | |
| 10-11 | | | | | 10-11 | | | | | 10-11 | | 100 | | |
| 11-12 | 210 | 200 | | | 11-12 | | | | | 11-12 | | | | |
| 睡眠期間 | 300<br>300<br>400 | 350 | | | 睡眠期間 | 400<br>480<br>220 | 350 | | | 睡眠期間 | 400<br>400<br>440 | | | |

antimuscarinics are needed for a patient who does not have OAB.

## CASE 8: FREQUENCY NOCTURIA AND BLADDER PAIN SUGGESTIVE OF INTERSTITIAL CYSTITIS/PAINFUL BLADDER SYNDROME

### *Case presentation*

The patient was a 64 year-old woman who had previously had a total hysterectomy for myoma uteri 5 years ago. For the last 5 years, she had suffered from frequent urinary tract infections at a rate of about twice per year. She had also complained of frequency and a small voided volume for 3 years; however, no urgency and no UUI were noted. In addition, she complained of lower abdominal discomfort that was associated with a full bladder. She had been treated with detrusitol for 1 month but without success (Table 8).

### *Interpretation and management*

The voiding diary reveals increased daytime and night time frequency with a small voided volume. There were several episodes of urgency but no UUI or nocturnal polyuria in the diary. The presence of bladder pain symptoms associated with the frequency and small voided volume means that IC/PBS should be suspected. Urgency is not an absolute symptom for OAB because patients with IC/PBS might also feel urgency to void and, sometimes, mistake the bladder feeling as urgency. Either antimuscarinics or analgesics could be tried and if the treatment fails, then an urodynamic study with a KCl test followed by cystoscopic hydrodistention may find the characteristic bladder findings for IC/PBS.

## CASE 9: BLADDER OUTLET OBSTRUCTION WITH OVERACTIVE BLADDER

### *Case presentation*

An 81 year-old man had DM and hypertension and had been under regular treatment for 5 years. He complained of frequency urgency, small urine flow and nocturia three times per night for 3 years. The Qmax was 8 mL/s, the voided volume was 257 mL, the PVR was 120 mL, the TPV was 64 mL, the TZI was 0.5, and the prostate specific antigen (PSA) was 3.9 ng/mL. He had been treated with doxazosin for 3 months but without success (Table 9).

### *Interpretation and management*

The voiding diary reveals increased daytime and night time frequency with a small voided volume both during the day and during the night. The diary also demonstrates the presence of urgency and UUI, but no nocturnal polyuria. This patient has an enlarged prostate, a large TZI, a low Qmax and a large PVR and therefore benign prostatic hyperplasia (BPH) causing BOO and the subsequent OAB is likely. A 5-alpha-reductase inhibitor (5-ARI), doxazosin and antimuscarinics can be added as treatment for the BOO and OAB. If this medical treatment fails, TUR-P might be helpful to relieve the BOO and allow a stable bladder to be recreated.

**Table 8.** Frequency Nocturia and Bladder Pain Suggestive of Interstitial Cystitis/Painful Bladder Syndrome (IC/PBS)

| 排 尿 記 錄 單 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 姓名：王 XX | | | | | | | | | |
| 日期(第一天)：4 月 23 日 | | | | | 日期(第二天)：4 月 24 日 | | | | |
| 時間 | 喝水量 | 尿量 | 急尿感 | 漏尿 | 時間 | 喝水量 | 尿量 | 急尿感 | 漏尿 |
| 08:00 | 100 | 70 | | | 08:10 | 120 | 100 | √ | |
| 08:40 | | 60 | √ | | 09:00 | 160 | 90 | | |
| 10:10 | 100 | 90 | | | 10:00 | 90 | | | |
| 12:00 | 110 | 120 | | | 11:00 | 80 | 50 | √ | |
| 13:00 | 120 | 150 | | | 12:00 | 110 | 70 | | |
| 13:50 | 50 | 70 | | | 12:40 | 70 | | | |
| 14:30 | 100 | | | | 13:50 | | 100 | | |
| 15:00 | | 110 | √ | | 14:00 | 120 | | | |
| 15:30 | 90 | 50 | | | 14:40 | 90 | 70 | | |
| 16:00 | | 60 | | | 15:30 | 100 | 120 | | |
| 17:00 | 160 | | | | 16:20 | 100 | 70 | | |
| 18:10 | 100 | 70 | | | 17:10 | | 50 | | |
| 19:00 | 100 | 50 | | | 18:00 | 120 | 50 | | |
| 19:50 | 70 | | √ | | 19:20 | 120 | 70 | | |
| 20:20 | 60 | 50 | | | 20:00 | 50 | 90 | | |
| | | | | | 20:30 | | 80 | √ | |
| | | | | | 21:20 | | 60 | | |
| 就寢時間：23:00 | | | | | 就寢期間：22:50 | | | | |
| 01:40 | | 150 | √ | | 01:00 | | 160 | √ | |
| 03:50 | | 100 | | | 02:30 | 50 | 100 | | |
| 05:10 | | 70 | | | 05:00 | | 120 | √ | |
| 07:00 | | 100 | | | 07:10 | | 90 | | |
| 總計 | 1160 | 1420 | | | 總計 | 1330 | 1400 | | |

## CASE 10: POLYDIPSIA, NOCTURNAL POLYURIA, OVERACTIVE BLADDER AND SMALL FUNCTIONAL CAPACITY

*Case presentation*

An 81 year-old man had a history of BPH s/p TURP at the age of 65 and the voiding had been uneventful for many years. He also had mild DM and had been under oral hypoglycemic treatment for >10 years; his sugar was AC 157, his BUN was 36 and his Cr was 3.1. He had complained of frequency urgency, UUI and nocturia for more than 5 year, but no dysuria was noted. He had been treated with detrusitol for 3 months but without success. Moreover, a dry mouth and dysuria had developed after detrusitol therapy (Table 10).

**Table 9.** Bladder Outlet Obstruction (BOO) with Overactive Bladder (OAB)

| 請記錄您從上午06:00到隔天上午05:59的排尿情況，由上到下依序填寫。 | | | | |
|---|---|---|---|---|
| 時間 | 尿急(√) | 尿失禁(√) | 排尿(√) | 排尿量(mL) |
| 06:17 | | | √ | 190 |
| 08:15 | | | √ | 120 |
| 09:30 | √ | | √ | 140 |
| 11:20 | | | √ | 120 |
| 11:58 | | | √ | 100 |
| 13:45 | √ | √ | √ | 150 |
| 14:00 | | | √ | 150 |
| 14:28 | | | √ | 120 |
| 15:00 | √ | | √ | 130 |
| 16:15 | | √ | √ | 110 |
| 17:00 | | √ | √ | 50 |
| 18:30 | | | √ | 110 |
| 21:20 | | | √ | 110 |
| 23:55 | | | √ | 200 |
| 03:00 | | | √ | 350 |
| 05:30 | | | √ | 240 |

*Interpretation and management*

The voiding diary reveals a high daily water intake and increased daytime/night time frequency. The small voided volume is constant and there is both urgency and UUI in the diary. Nocturnal polyuria is also noteworthy. Polydipsia due to hyperosmolality (DM and azotemia), OAB, a small bladder capacity, and nocturia polyuria are combined in this patient. Antimuscarinics should be added to treat the OAB together with DDAVP before sleep to treat the nocturnal polyuria. Restricting fluid intake is also necessary to decrease his daily urine output. If the antimuscarinics do not work, then we may consider a beta-3 adrenergic agonit to treat his refractory DO.

## REFERENCES


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**Table 10.** Polydipsia, Nocturnal Polyuria, Overactive Bladder (OAB) and Small Functional Capacity

| 排 尿 記 錄 單 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 姓名：李 XX | | | | | | | | | | | | | | |
| 日期(第一天)：9 月 14 日 | | | | | 日期(第二天)：9 月 15 日 | | | | | 日期(第三天)：9 月 16 日 | | | | |
| 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 | 時間 | 尿量 | 喝水量 | 急尿感 | 漏尿 |
| 7-8 | 100, 80 | 230 | 2 | | 7-8 | 120, 80, 50 | 230 | 3 | | 7-8 | 80, 100, 50 | 230 | 3 | |
| 8-9 | 100, 70, 80 | 460 | 3 | | 8-9 | 100, 100, 80 | 460 | 3 | | 8-9 | 100, 80, 60 | 460 | 3 | |
| 9-10 | 100, 100 | 230 | 2 | | 9-10 | 100, 50 | 230 | 2 | | 9-10 | 50, 100 | 230 | 2 | |
| 10-11 | 120, 90 | 230 | 2 | | 10-11 | 120, 70 | 230 | 2 | | 10-11 | 100, 70 | 230 | 2 | |
| 11-12 | 180, 100, 120 | 230 | 3 | | 11-12 | 100, 80 | 230 | 2 | | 11-12 | 80, 100 | 230 | 2 | |
| 12-1 | 150, 80, 100 | 230 | 3 | | 12-1 | 180, 100, 80 | 230 | 3 | | 12-1 | 80, 100, 120 | 230 | 3 | |
| 1-2 | 100, 110 | 230 | 2 | | 1-2 | 180, 100, 80 | 230 | 3 | | 1-2 | 80, 100 | 230 | 2 | |
| 2-3 | 100, 120 | 230 | 2 | | 2-3 | 100, 150 | 230 | 2 | | 2-3 | 100, 120 | 230 | 2 | |
| 3-4 | 80,100, 80 | 230 | 3 | | 3-4 | 100, 80, 50 | 230 | 3 | | 3-4 | 80, 100, 60 | 230 | 3 | |
| 4-5 | 100, 80 | 230 | 2 | | 4-5 | 80, 90 | 230 | 2 | | 4-5 | 90, 100 | 230 | 2 | |
| 5-6 | 80, 120 | 230 | 2 | | 5-6 | 150, 80 | 230 | 2 | | 5-6 | 80, 120 | 230 | 2 | |
| 6-7 | 100, 80, 100 | 460 | 3 | | 6-7 | 80, 120, 50 | 460 | 3 | | 6-7 | 100, 80, 60 | 230 | 3 | |
| 7-8 | 100, 100 | 230 | 2 | | 7-8 | 100, 80 | 230 | 2 | | 7-8 | 100, 80 | 230 | 2 | |
| 8-9 | 80, 100 | 230 | 2 | | 8-9 | 100, 120 | 230 | 2 | | 8-9 | 60, 120 | 230 | 2 | |
| 9-10 | 100, 50, 150 | 460 | 4 | √ | 9-10 | 150, 120, 80 | 460 | 3 | | 9-10 | 100, 80, 120 | 460 | 3 | |
| 10-11 | | | | | 10-11 | | | | | 10-11 | | | | |
| 11-12 | | | | | 11-12 | | | | | 11-12 | | | | |
| 睡眠期間 | 1400/ 7 次 | | | | 睡眠期間 | 1300/6 次 | | | | 睡眠期間 | 1300/6 次 | | | |