

ANALYSIS OF VOIDING FUNCTIONS USING RADIO TELEMETRY SYSTEM IN RATS WITH BLADDER OUTLET OBSTRUCTION.

Hypothesis / aims of study

Bladder outlet obstruction (BOO) due to benign prostatic hyperplasia (BPH) causes lower urinary tract symptoms (LUTS). BOO animal models are often used for elucidating the pathological condition in basic research, and show the increased non-voiding contraction and the increased residual urine volume. However, because the cystometries are performed using the non-physiological filling rate, it is not always easy to explain the data. Therefore, it is important to measure voiding functions in a natural condition. A radio telemetry system is a very useful device for dispelling the problems, because it is possible to measure intravesical pressure for 24 hr in a natural condition. In this study, we examined the pathological voiding functions in BOO rats using the combination method of a radio telemetry system and a frequency voiding chart (FVC).

Study design, materials and methods

BOO was created in female SD rats. A silk ligature was tied around the proximal urethra (1.1 mm). A radio telemetry transmitter was implanted in the peritoneal cavity. And the tip of the pressure transducer catheter was inserted in bladder dome. After 2-3 weeks of BOO, the animals were placed in a metabolic cage to measure voiding frequency and volume. A radio telemetry recording and FVC were concurrently performed for 24 hr.

Results

BOO rats showed the increased voiding frequency in FVC. There were two types of the voiding frequency pattern in BOO rats: animals with a high frequency of a small amount of voided volume and without them. In radio telemetry recording, BOO rats had a lot of small contractions in storage phase and contractions with a high pressure in voiding phase. Then, it was found that a high frequency of a small amount of voided volume arose in storage phase in the absence of contractions with a high pressure, from both the FVC and the radio telemetry recording.

Interpretation of results

In the present study, we found that BOO rats showed a lot of small contractions for storage phase in a natural condition, similar to the rhythmic myogenic contractions in cystometric studies. Detrusor overactivity exists in BOO rats under a natural condition.

Concluding message

It would be possible to monitor pathological voiding functions in BOO model using this combination method of a radio telemetry system and a frequency voiding chart. Therefore, the device is a very useful for studying the voiding functions in a natural condition.

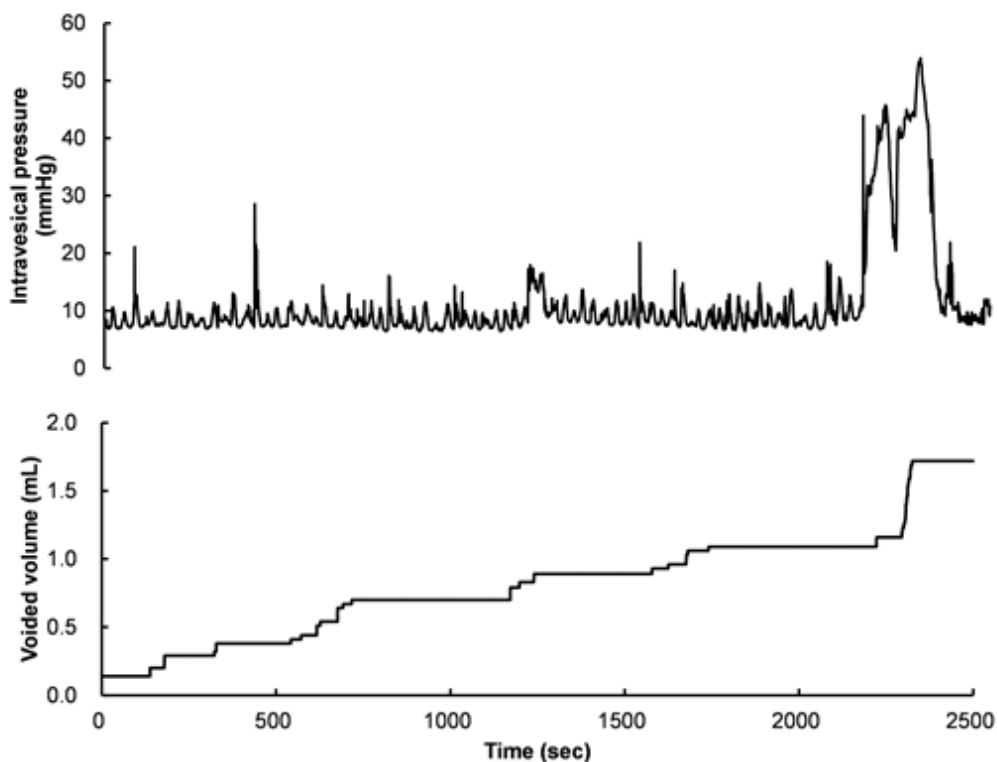


Fig. 1 Typical chart of cystometry in the BOO rat using the radio telemetry system.

Disclosures

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