#25124 Ablation of prostate ventral lobes induces urinary dysfunction but does not affect sexual function neither fetility in rats

Juárez M[1], Lucio RA[1], **Medina D[1]**, Pérez I[2], Pérez A[1], Cruz Y[1]

1. Universidad Autónoma de Tlaxcala. 2. Universidad Veracruzana

Introduction

The accessory sexual organs of male rats include seminal vesicles, coagulating glands, bulbourethral glands, and prostate (Figure 1).The prostate has three pairs of lobes: dorsal, lateral, and ventral. The latter is the largest one and is firmly attached to the urinary bladder wall (Figure 1).

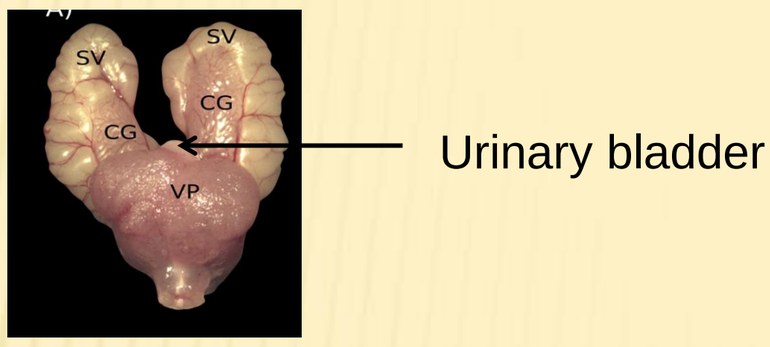

Figure 1. Accessory sexual glands of males rats SV, seminal vesicles; CG, coagulating glands; and VP, ventral prostate. (Arellano et al. In process of publication).

It is worth mentioning that seminal vesicles and coagulating glands decrease in weight and size after several ejaculations, however the size of the ventral prostate lobes does not change (Figure 1). This finding let us to **hipothesize** that the ventral prostatic lobes are not crucial for the control of sexual nor reproductive functions but its removal (prostatectomy) induces urinary dysfunction due to damage of bladder tissue and/or innervation.

Objective

To evaluate the effect of ventral prostate ablation on copulatory behavior, fertility and urinary parameters in male rats.

Study design

Adult male Wistar were assigned to bilateral ablation of the ventral prostate lobes, group (VPx; n=9) or sham surgery (Sh; n=9). Ablation of ventral prostate was performed under ketamine-xylazine anesthesia (60 mg/kg and 7.5 mg/kg). In Sh animals, the prostatic lobes were localized but not removed. Copulatory behavior and micturition were recorded before surgery and 15 and 30 days after surgery. The behavior of micturition was videorecorded during the last 6 h of dark phase. Fertility, was measured postsurgery at 30 days.

Mann-Whitney U test (fertility parametes) and Two-way ANOVA repeated measured tests (copulatory and micturition behavior) were used to analyze the data, alpha $p \leq 0.05$.

Results

Copulatory behavior

There were no significant differences in any copulatory parameters (number of mounts, number of intromissions, mount latency, intromission latency, ejaculation latency), nor fertility. U Mann Whithney=20, p=0.3 (Table 1).

Table 1. Fertility parameters of male rat with ablation of the ventral prostate

	Porcentage of pregnancy	Number of pups/litter
Sham (n=9)	77.7	10.0±1.2
VPx (n=9)	88.8	10.8±1.0

The data are expressed as mean ± SE

Micturition

During presurgery, the voiding behavior did not vary between groups (Sh 8.3±0.3 *vs* VPx 7.2±0.7). In VPx animals, the voiding frequency increased and the voiding interval decreased at both 15 and 30 postsurgery days ($p<0.001$; Figure 2).

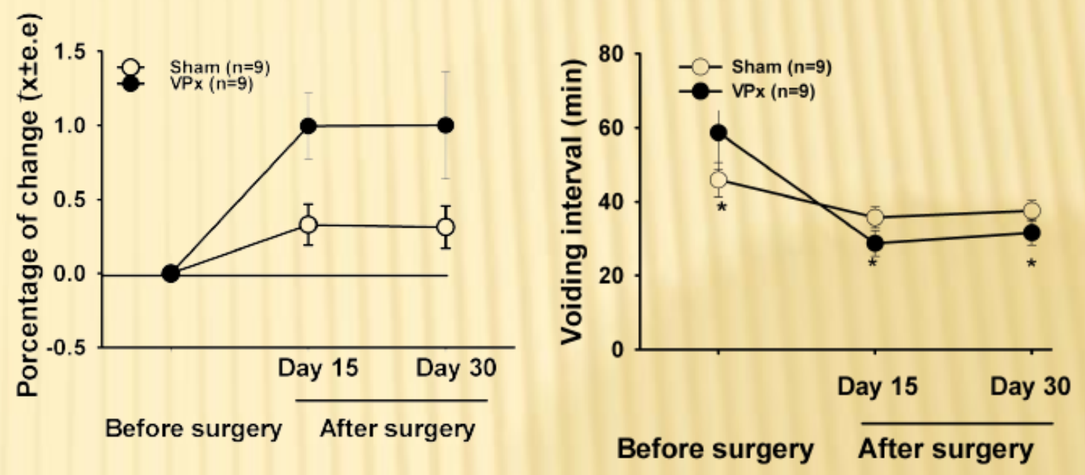

Figure 2. Voiding frequency and voiding interval recorded in 6h, before and after abaltion. White circle, sham group and black circles, VPx group.

Neither voiding volume, ($p=0.4$), nor voiding duration ($p=0.8$) change before and after surgery (Figure 3).

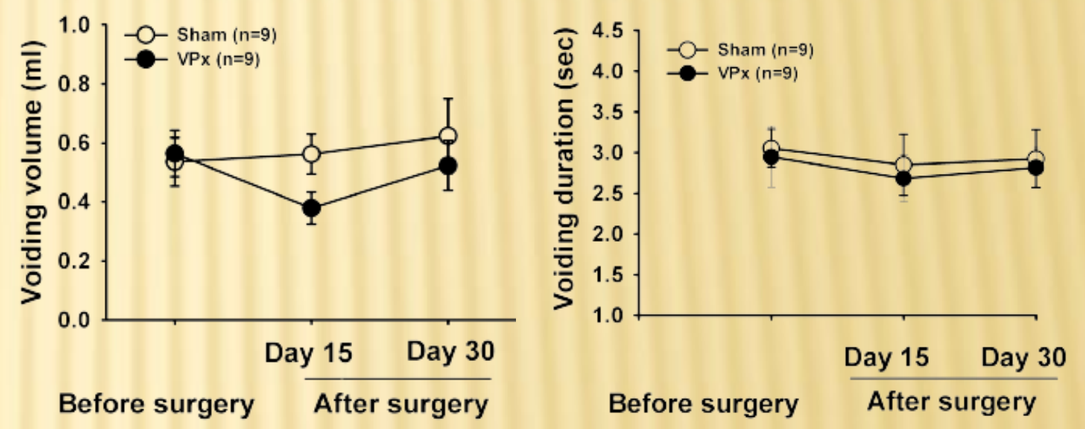

Figure 3. Voiding volume and voiding duration, before and after ablation. White circle, sham group and black circles, VPx group.

During presurgery, all rats voided with stereotyped behavior of micturition. VPx group, males presented signs of urinary dysfunction: paused micturitions and slow fluid emission. No urinary leakage was observed during effort (Figure 4).

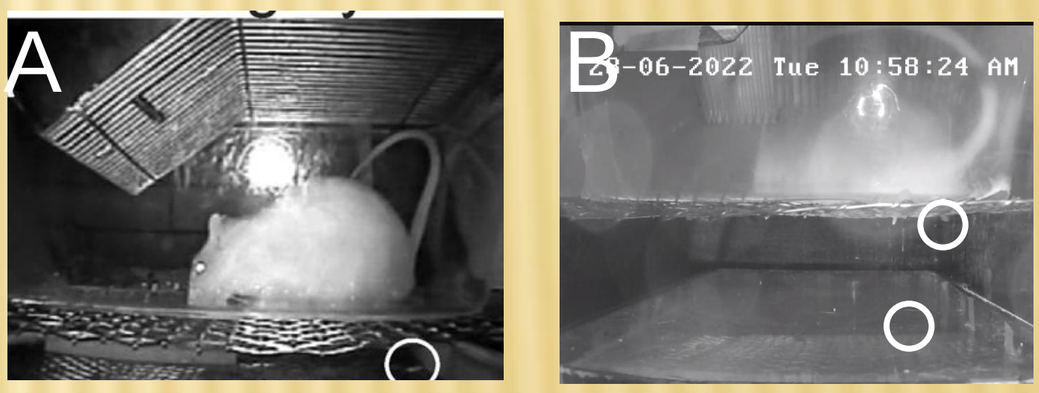

Figure 4. A. Stereotyped micturition behavior in a Sh male rat. White circle=intermitent urine expulsion. B. Small fluid of urine in a VPx male rat at 15 days after surgery. White circle=small volume of urine.

Conclusions

Our findings suggest that the rat ventral prostate is not crucial for sexual nor reproductive function, its removal affect the urinary function. Since the ventral prostate adjoins the anterior wall of the urinary bladder, it is posible that prostatectomy damages the urinary nerves, causing post-ablation urinary leakage. This surgical manipulation could be a model of partial bladder denervation.