

IMPACT OF INCREASED ABDOMINAL PRESSURE DURING MICTURITION ON INGUINAL HERNIA DEVELOPMENT AFTER RADICAL PROSTATECTOMY: ANALYSIS IN PRESSURE FLOW STUDY

Hypothesis / aims of study

Inguinal hernia (IH) after radical prostatectomy (RP) has been recognized as a common postoperative complication. However, there is no sufficient explanation of the mechanism involved in IH development. We assumed that increased abdominal pressure in voiding phase after RP might be implicated in IH development. To clarify the etiology of IH as a postoperative complication of RP, we took another look at the pressure-flow study (PFS), especially focused on abdominal pressure.

Study design, materials and methods

We retrospectively reviewed a total of 46 male patients (median age: 67.5 years, range: 53-74) with prostate cancer who underwent retropubic RP or laparoscopic RP. PFS was conducted both at pre-RP and 12-24 months after RP. Patients were divided into the following two groups: patients with (H group) and without (N group) IH development. We defined the difference between abdominal pressure just before voiding and maximal abdominal pressure during voiding as Pabd in the present study. We also defined the difference of Pabd between pre- and post-RP as Δ Pabd (Figure 1). Parameters assessed for their relation to IH were age, body mass index, history of the previous abdominal surgery, operative procedure, urethral stricture, Pabd, Δ Pabd and bladder outlet obstruction. Risk factors were evaluated using a Cox proportional hazards model.

Results

IH occurred in a total of 12 patients (26%). The laterality was 3 (25%), 4 (33%) and 5 (42%) on left, right and bilateral, respectively. The median interval until diagnosis of IH was 6 months (range: 3-14) after RP.

PFS revealed that Qmax was significantly increased ($p=0.0039$) and detrusor pressure at Qmax ($p<0.0001$) and PVR ($p=0.0089$) were significantly decreased at 12-24M after RP compared to pre-RP. Bladder outlet obstruction, which was assessed with A-G nomogram and bladder outlet obstruction index, was released after RP.

There were 28 patients (61%), who showed increased Pabd after RP (Figure 2). Pabd was significantly increased after RP ($p = 0.016$), and the median pre- and post-operative Pabd were 48cmH₂O (range: 10-125) and 59cmH₂O (range: 18-167), respectively. Focused on the incidence of IH, it was significantly higher in patients with increased Pabd after RP ($p = 0.011$), and then 11 patients (92%) showed increased Pabd in H group (Figure 2). The proportional hazards analysis demonstrated that only Δ Pabd was a significant risk factor for the development of IH (HR 9.09, 95% CI 1.12-50.0, $p=0.04$).

Interpretation of results

RP releases bladder outlet obstruction with increased Qmax and decreased detrusor pressure at Qmax and PVR. Patients who have RP may use straining during the whole course of micturition, which would be similar to women's voiding behaviour. This change of voiding behaviour could be implicated in development of IH after RP.

Concluding message

The abdominal pressure in voiding phase is likely to increase after RP, and it could be one of causes to develop IH after RP.

Figure 1

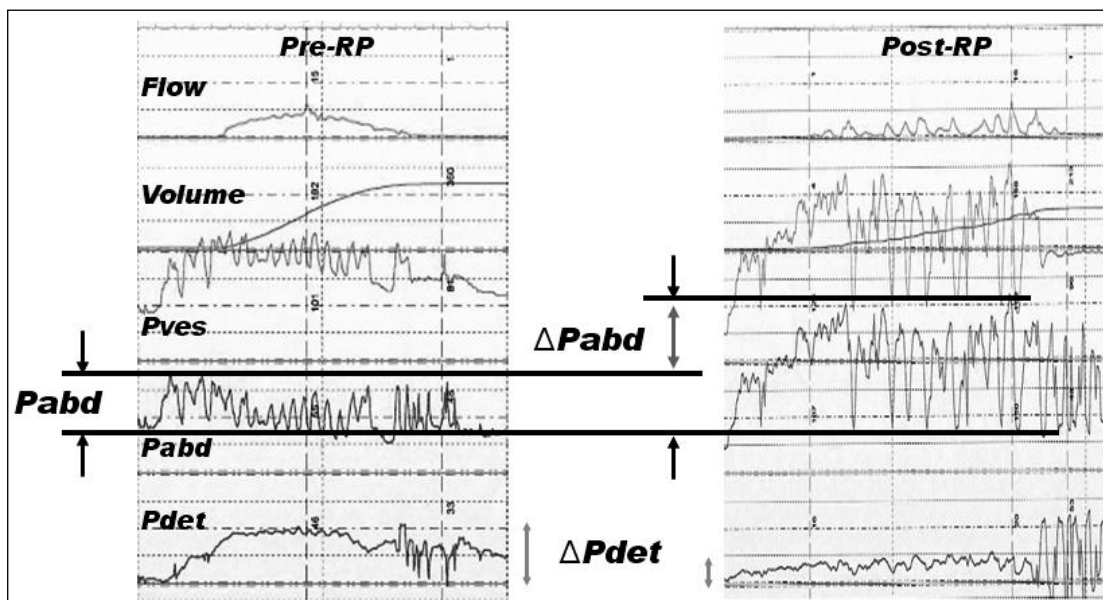
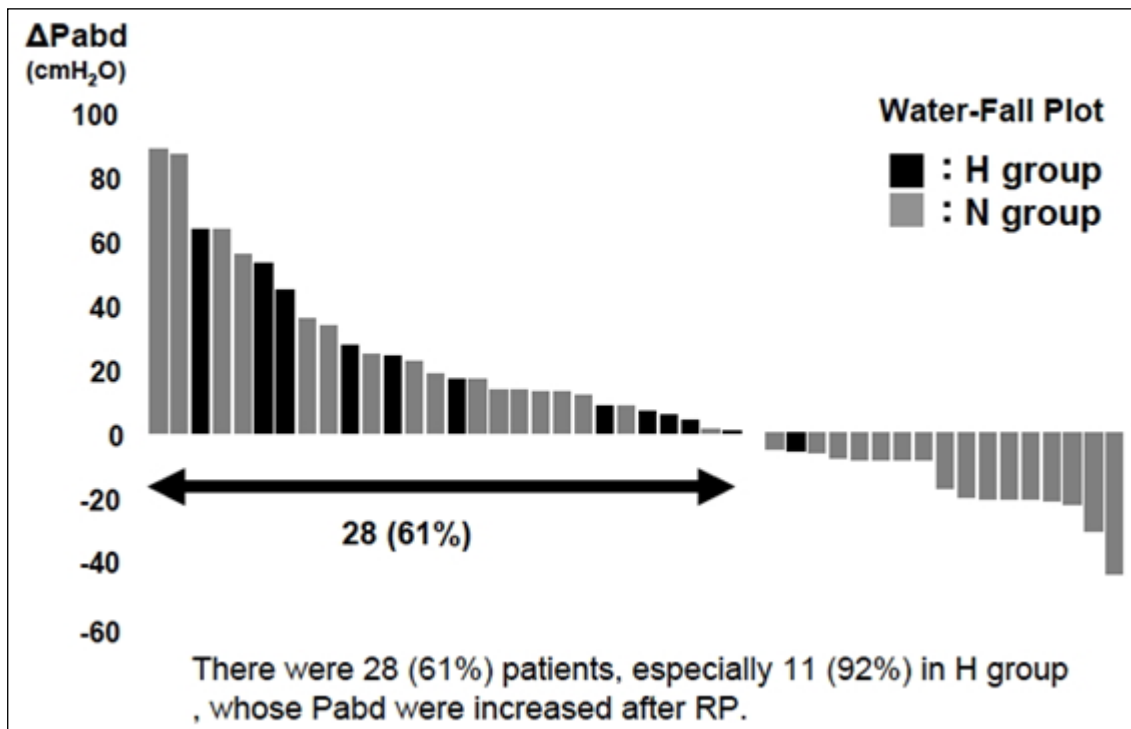


Figure 2



<i>Specify source of funding or grant</i>	None
<i>Is this a clinical trial?</i>	Yes
<i>Is this study registered in a public clinical trials registry?</i>	No
<i>Is this a Randomised Controlled Trial (RCT)?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	Ethics Committee, Hokkaido University Hospital
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes