Post-Radical Retropubic Prostatectomy Inguinal Hernia: An Analysis of Risk Factors With Special Reference to Preoperative Inguinal Hernia Morbidity and Pelvic Lymph Node Dissection

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Purpose: Inguinal hernia after radical retropubic prostatectomy has been reported to occur in 7% to 21% of patients. We analyzed the impact of simultaneous pelvic lymph node dissection, preoperative inguinal hernia morbidity, postoperative anastomotic stricture, duration of surgery and patient age. We also compared the detection rate of inguinal hernia events in a retrospective patient file survey to that in a prospective patient administered questionnaire.

Materials and Methods: A total of 498 patients underwent radical retropubic prostatectomy plus pelvic lymph node dissection and 166 underwent radical retropubic prostatectomy only. Mean followup was 40 months (median 37, range 3 to 85). All 664 patients were analyzed in the patient file survey. The patient administered questionnaire was mailed preoperatively, and after 3, 6, 12, 18, 24 and 36 months to 271 patients who underwent operation between 2001 and 2002. A total of 207 patients (76.4%) completed the preoperative questionnaire.

Results: The cumulative incidence of inguinal hernia after 24 months was 11.6% in the patient file survey and 15.7% in the patient administered questionnaire. In the patient file survey patient age was the only studied factor that significantly influenced risk. The patient file survey failed to detect half of the men with preoperative inguinal hernia morbidity and a third of post-radical retropubic prostatectomy inguinal hernias compared to the patient administered questionnaire. On patient administered questionnaire analysis preoperative inguinal hernia morbidity was a significant risk factor for postoperative inguinal hernia (log rank Mantel-Cox test $p = 0.010$).

Conclusions: Previous inguinal hernia morbidity and age increase the risk of post-radical retropubic prostatectomy inguinal hernia. Simultaneous pelvic lymph node dissection, postoperative anastomotic stricture and duration of surgery were not significant risk factors in this study. The patient file survey is inferior to the patient administered questionnaire for detecting inguinal hernia events.

Key Words: prostate; prostatic neoplasms; prostatectomy; hernia, inguinal; complications

Radical retropubic prostatectomy is one of the most common procedures in urological surgery. Incontinence, impotence and postoperative anastomotic stricture are complications well described in the literature.[1] IH as a complication of RRP was first recognized in 1996 by Regan et al, who reported a 12% incidence within 6 months of RRP.[2] In the following year Fischer and Wantz reported a case-control study of 1,504 hernioplasties in males showing an over representation of patients who had previously undergone RRP (6.1%).[3] In 2001 we reported a crude incidence of 13.6% in 375 patients who underwent RRP with simultaneous PLND at a mean followup of 39 months for a cumulative incidence of 11% at 24 months.[4] The study indicated that the risk of postoperative IH was increased in patients who had previously undergone IH surgery and also increased according to higher patient age. The high incidence of post-RRP IH was further confirmed in at least 5 recent studies describing an incidence of between 7% and 21%.[5–9] We also reported that the crude IH incidence in a large group of men with nonmetastatic prostate cancer treated without surgery was only 2.4% at a median followup of 39 months.[8] The cumulative incidence was 1% at 24 months. Similar values were reported by Tsai et al.[6] These studies confirm that IH truly represents a complication in patients who undergo to RRP.

We studied the impact of 5 potential risk factors for post-RRP IH development, including simultaneous PLND, preoperative IH morbidity, postoperative anastomotic stricture, patient age at RRP and surgical procedure duration. In January 2001 a quality control instrument was introduced at our clinic in the form of a prospective PAQ, which is completed preoperatively and postoperatively. Among other factors we inquired about preoperative and postoperative IH morbidity. We also compared the detection rate of preoperative and postoperative IH morbidity in the retrospective PFS to that in the PAQ.

MATERIALS AND METHODS

All 675 patients who underwent RRP at our institution from January 1998 to December 2002 were primarily included in this study. A total of 11 patients were excluded from analysis due to a followup shorter than 3 months. The remaining 664 patients had a mean followup of 40 months (median 37,

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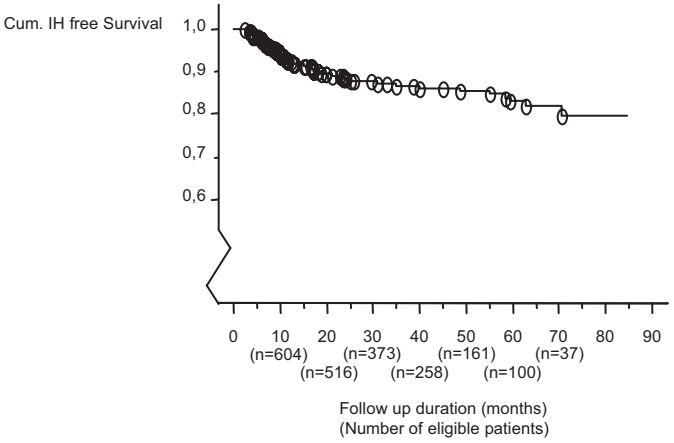

FIG. 1. Kaplan-Meier plot of cumulative (*Cum.*) IH-free survival in PFS in 664 patients (89 events).

range 3 to 85). Simultaneous RRP plus PLND was performed in 498 patients in whom mean followup was 44 months (median 43, range 3 to 85). The remaining 166 patients underwent RRP only and had a mean followup of 27 months (median 25, range 3 to 60). In 1998 and 1999 almost all patients underwent nonnerve sparing RRP plus PLND. However, as of 2000, most patients with Gleason score 6 or less, prostate specific antigen less than 10 ng/ml and 2 or fewer positive biopsy cores underwent nerve sparing RRP without simultaneous PLND. Therefore, followup was somewhat shorter in patients who underwent RRP alone.

All procedures were performed basically using the technique of anatomical RRP described by Walsh.[10] When a prevalent IH was repaired during RRP, as in 11 men, the preperitoneal technique described by Schlegel and Walsh was used.[11]

For the PFS clinical files from the time of surgery and thereafter were examined for postoperative IH events. We also recorded preoperative IH morbidity, ie previous IH surgery and/or a prevalent IH at RRP, as reported in the files, as well as patient age at RRP, procedure duration and a diagnosis of postoperative anastomotic stricture. Patients were followed postoperatively at 3, 6 and 12 months, and thereafter yearly. In the PFS postoperative IH was defined as de novo or recurrent IH after previous IH surgery, as mentioned in the patient file. Patients were not systematically asked about or examined for IH. Consequently only clinically apparent IHs that had been noted in the files were detected in the PFS.

As part of the postoperative routine, patients were asked about voiding patterns. If an anastomotic stricture was suspected, cystoscopy was done to confirm or rule out this complication. Thus, subclinical strictures may have remained undetected.

The 271 patients who underwent RRP between January 2001 and December 2002 were mailed a preoperative questionnaire immediately before being hospitalized for surgery. Among other things, the questionnaire inquired about previous IH surgery and prevalent IH. Further questionnaires inquiring about any new or recurrent IH noticed by the patient during followup were subsequently mailed 3, 6, 12, 18, 24 and 36 months postoperatively. Of the patients 207 (76.4%) completed the preoperative and at least 1 postoperative questionnaire, and were included in this analysis. RRP plus PLND was performed in 94 patients and RRP only in 113. Mean followup time in the questionnaire based group was 24.6 months (median 24.0, range 3 to 36).

PAQ data were compared with those obtained in the PFS on the corresponding 207 patients. For this comparison the definition of postoperative IH was a patient reported event in response to a direct question in the PAQ, while in the PFS it was defined as a physician recorded event.

A multivariable Cox proportional hazard model was used to calculate the relative risks of studied potential risk factors for PFS and PAQ data. A Kaplan-Meier cumulative survival plot was used to evaluate cumulative herniafree survival in the retrospective PFS. A life table cumulative survival plot and log rank Mantel-Cox test were used to evaluate the influence of preoperative IH morbidity in the PAQ based study.

RESULTS

Retrospective PFS in 664 Patients

Mean patient age at RRP was 63 years. An IH developed postoperatively in 89 patients (13%), of which 30 were on the left side, 37 were on the right side, 3 were bilateral and 19 were on an unknown side. Mean time to IH was 16 months (median 11, range 3 to 71). Figure 1 shows cumulative postoperative IH-free survival. Table 1 shows the cumulative incidence of IH.

Of the 498 patients who underwent RRP plus PLND 66 (13%) had an IH postoperatively compared to 23 of the 166 (14%) who underwent RRP only. A total of 56 patients had undergone previous IH surgery, of whom 8 experienced an IH postoperatively, including 4 on the previously operated side. Thus, the recurrence rate of IH after RRP was 7.1% (4 of 56 cases). Of the 25 patients who presented with a prevalent IH at RRP 11 had also undergone previous IH surgery. Eight of the 25 prevalent IHs were repaired during RRP. Thus, 70 patients (56 + 25 − 11 or 11%) had any form of preoperative IH morbidity, of whom 9 (13%) had an IH postoperatively. A total of 66 patients had an anastomotic stricture postoperatively, of whom 11 (16.7%) also had an IH postoperatively.

The mean duration of surgery was 129 minutes. The RRP only group underwent nerve sparing procedures. The time gained by not performing PLND was balanced by extra time required to dissect the neurovascular bundles. Therefore, the duration of surgery was identical in the 2 groups.

Table 2 lists Cox proportional HRs for the potential risk factors on PFS based analysis. Only patient age was a significant risk factor. PLND, previous IH morbidity, postoperative anastomotic stricture and surgery duration were not significant risk factors for an IH postoperatively.

TABLE 1. *Cumulative postoperative IH incidence 12, 24 and 36 months postoperatively in retrospective PFS and PAQ*

	PFS	PAQ
No. pts	664	207
% Incidence:		
12 Mos	7.6	10.8
24 Mos	11.6	15.7
36 Mos	13.1	19.5