

Inguinal Hernia after Radical Retropubic Prostatectomy – Experience of Kaohsiung Veterans General Hospital

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Key Words

anastomotic stricture;
inguinal hernia;
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Background. Radical retropubic prostatectomy is a potentially curative treatment for localized prostate cancer. This study aimed to examine the incidence of developing inguinal hernia after radical retropubic prostatectomy and its possible factors.

Methods. From November 1990 to April 2002, there were 222 patients in Kaohsiung Veterans General Hospital who underwent radical retropubic prostatectomy and pelvic lymph node dissection for localized prostate cancer. Another 200 patients with prostate cancer who did not receive surgical intervention were enrolled as the control group. The medical charts were reviewed with an emphasis on the possible mechanisms causing inguinal hernia.

Results. The period of follow-up ranged from 2 to 137 months, with a median of 54 months. There were a total of 15 (6.7%) patients who developed inguinal hernia after radical retropubic prostatectomy and pelvic lymph node dissection in our hospital. Post-prostatectomy anastomotic stricture was noted in 7 (46%) patients. Ten patients (67%) developed indirect type inguinal hernia. Only 4 (2%) inguinal hernias were found in the control group.

Conclusions. The incidence of inguinal hernia among patients undergoing radical retropubic prostatectomy and pelvic lymph node dissection was higher than that among patients without operation. Post-operative anastomotic stricture was the most important predisposing factor in the current study.

Radical retropubic prostatectomy (RRP) is a choice for treating patients with localized prostate cancer. However, according to a review of the literature, the incidence of inguinal hernia is clearly increased after radical retropubic prostatectomy.¹ The fact that inguinal hernia may be a common complication after radical retropubic prostatectomy was initially recognized in 1996 by Regan *et al.*, who reported an incidence of 12% within 6 months postoperatively.¹ Nevertheless, among the complications following prostatectomy, the problem has not caught so much attention. This study, therefore, aimed to present the incidence of developing inguinal hernia after radical retropubic prostatectomy over an 11-year period at our institute. Possible risk factors of RRP will also be examined.

METHODS

We retrospectively reviewed the charts of patients with

prostate cancer from November 1990 to April 2002 in our hospital. The main study group consisted of 222 patients with prostate cancer who underwent radical retropubic prostatectomy and pelvic lymph node dissection. Two-hundred prostate cancer patients were chosen from 482 patients who did not undergo such operation with simple random sampling and enrolled as control group. The mean age of the 222 patients who underwent operation was 69 years old and that of the control group was 67 years old.

The majority of the operative procedures were performed by using a standard technique as described by Walsh and Donker.² We routinely performed pelvic lymph node dissection (PLND) before proceeding with radical prostatectomy. If the frozen section of dissected lymph node showed metastasis, radical prostatectomy would be abandoned. The clinical characteristics of those patients were recorded after reviewing the charts. The data, including the age of the patients, the interval between operation and hernial occurrence, post-prosta-

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tectomy anastomotic strictures, prior hernial surgery, and cancer stage, were analyzed. The period of follow-up ranged from 2 months to 137 months with a median of 54 months.

Post-prostatectomy anastomotic stricture was defined as stricture confirmed by endoscopy at anastomotic level that required incision. Both the prior hernial surgery record and post-prostatectomy hernias were based on the statement of the patients and on clinical physical examination. The types of inguinal hernias after radical retropubic prostatectomy were also recorded and analyzed.

Chi-square test and Student's t-test were used for checking the statistical significance of our study results. Those results and those of other similar studies by Regan *et al.*,¹ Fischer *et al.*,³ and Lodding *et al.*⁴ were also compared. The compared items included sample size, incidence rate, patients' mean age, the types of hernias, and anastomotic stricture.

RESULTS

Of the 222 patients who underwent RRP and PLND in our study, 15 patients (6.7%) developed inguinal hernias post-operatively. Ten patients (67%) were reported to have indirect type inguinal hernia. As for the 200 patients who did not undergo operation, inguinal hernias was found in only 4 patients (2%). The incidence of inguinal hernia was 3 times higher in the operated group than in the unoperated group. The results were significant with Chi-Square test ($p < 0.05$) and Student's t-test (Table 1).

Fifty-three percent of the cases showed a new complaint of a symptomatic groin bulge within 1 year. Only 1 patient who underwent RRP had previous history of hernioplasty in our study. Eighty percent of the cases were localized organ-confined prostate cancer ($\leq T2$

Table 2. Characteristics of inguinal hernias following radical retropubic prostatectomy

Type of hernia (no.)	Indirect (10)	Direct (3)	Unclear (2)
Interval			
≤ 6 mons	3	1	1
6~12 mons	2	1	0
12~24 mons	4	0	1
≥ 24 mons	1	1	0
Tumor stage (%)			
T1	1 (6.7%)	0	0
T2	7 (46.7%)	3 (20%)	1 (6.7%)
T3	2 (13.3%)	0	1 (6.7%)
T4	0	0	0
Prior hernial surgery	0	1	0

stage) (Table 2). Anastomotic stricture was noted during follow-up in 7 of the 15 patients who underwent operation and complicated with inguinal hernia development. From the results of our study, the incidence of post-operative inguinal hernia development was 6.7%. More than a half of the patients in all these studies belonged to indirect type inguinal hernia.

DISCUSSION

With the increasing number of prostate cancers in Taiwan, more radical retropubic prostatectomy has been performed recently. Clinical physicians and urologists are becoming more and more aware of the potential complications of the operative procedures. According to a review of the literature, the incidence of inguinal hernia was found to be clearly increased after radical retropubic prostatectomy.¹ However, whereas complications such as impotence and incontinence are well described, post-operative hernia has not received a great deal of attention. The fact that inguinal hernia may be a common

Table 1. Profiles of operated and unoperated groups

	RRP+PLND (n = 222)	Unoperated (n = 200)	p value
No. hernia (%)	15 (6.7%)	4 (2%)	0.020
Indirect	10 (67%)	4 (100%)	
Direct	3 (20%)	0	
Unclear	2 (13%)	0	
Anastomotic stricture	7/15 (46%)	0/4	
Mean age (range)	69 (57~75)	67(62~74)	0.196

RRP+PLND = radical retropubic prostatectomy and pelvic lymph node dissection.

Table 3. Comparison with other studies

Studies	No. Pts.	Incidence (No.)	Mean age (yrs)	Indirect type (%)	Direct type (%)	Anastomotic stricture
Present study	222	6.7% (15)	69	67%	20%	7/15 (46%)
Regan <i>et al.</i> ¹	91	12% (11)	N.A.	91%	9%	N.A.
Fischer and Wantz ³	1504	6.1% (91)	71	58%	21%	N.A.
Lodding <i>et al.</i> ⁴	375	13.6% (51)	67	71%	4%	43/375 (11.5%)

N.A. = not available.

complication after radical retropubic prostatectomy was initially recognized in 1996 by Regan *et al.*¹ who reported an incidence of 12% within 6 months after RRP. From the results of our study and other similar studies,^{1,3,4} the incidence of post-operative inguinal hernia development was between 6.1% and 13.6% (Table 3).

Some predisposing factors such as old age, damage to the transversalis muscle, prolonged use of self-retaining retractor during operation, post-operative anastomotic stricture and mobilization of the bladder medially to expose the iliac vein have been advocated.⁴ From a review of the literature, the relationship of old age and post-operative anastomotic stricture with inguinal hernias was identified. Weaker abdominal muscles may also explain increased risk in older patients.⁴

On the other hand, the study by Lodding *et al.*⁴ indicated a relationship between the post-operative hernia development and previous hernial surgery. Previous hernial surgery seemed to protect the patient from post-prostatectomy hernia on the operated side, while the risk is increased on the contralateral side.⁴ In our study, the only 1 patient with history of hernioplasty did develop contralateral-side inguinal hernia following RRP, which was consistent with the study of Lodding *et al.*⁴

In addition, post-operative anastomotic stricture might truly be the most important cause resulting in inguinal hernia development. Just as bladder outlet obstruction caused by benign prostatic hyperplasia, it is reasonable to believe that post-prostatectomy anastomotic stricture, which forces the patients to strain to void, increases the risk of hernia. However, more research is needed to corroborate the hypothesis.

Some limitations of our study need to be considered due to the retrospective methodology we adopted. First, since we did not perform thorough physical examinations, routine uroflowmetry, or cystourethroscopy during the postoperative follow-up period, some cases with

asymptomatic inguinal hernias and/or subclinical post-prostatectomy anastomotic stricture might be neglected. Second, patients in the control group had higher tumor stages than the RRP group; there might be a bias causing unbalanced baseline in terms of bladder outlet obstruction between the 2 groups. Third, while the subjects were divided into 3 groups in the study of Lodding *et al.*⁴ (RRP and PLND, PLND only, and unoperated group), we did not differentiate the group of the RRP and PLND from that of PLND only. In our hospital, because of positive pelvic lymph node on frozen section examination, few patients underwent PLND only without proceeding prostatectomy.

However, we believed that the additional radical retropubic prostatectomy following pelvic lymph node dissection would not add further adverse effect on developing postoperative inguinal hernia. The belief was based on the fact that no further manipulation was applied on the bladder, spermatic cord and inner annulus of inguinal canal during proceeding prostatectomy. The results from the study of Lodding *et al.*⁴ also supported our hypothesis. No differences were revealed between the group of RRP and PLND and the group of PLND only.

On the basis of the findings from this study and other studies, some suggestions for future treatment were elaborated to lower the incidence of post-prostatectomy inguinal hernias development. Inguinal hernia, which is clinically apparent at radical retropubic prostatectomy, can be safely and efficiently repaired during prostatectomy. Thus, exploring the spermatic cord for subclinical hernia and narrowing the internal annulus with a possible single return suture should not cause negative side effects during radical retropubic prostatectomy.⁴ Schlegel and Walsh have also reported that while awaiting frozen section of pelvic lymph node, they repaired any defect in inguinal floor or ring without any complication or recurrence.⁵ Consequently, it is suggested that a surgical prophylactic procedure can be adopted.

In conclusion, the incidence of the inguinal hernia in

patients undergoing RRP and PLND was higher than that of our unoperated group. Most of them belonged to indirect type and developed within 1 year after operation. Post-prostatectomy was associated with higher incidence of developing inguinal hernia in our study. The possibility of developing inguinal hernia after surgery should be indicated in the informed consent, and a surgical prophylactic procedure might be needed during prostatectomy.

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