Original Articles/นิพนธ์ต้นฉบับ

Effect of BMI to Estimated Blood Loss, Operative Time and Surgical Margin Status in Open Radical Prostatectomy.

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Abstract

Objective: To find the effect of body mass index (BMI) to perioperative outcome and pathological outcome of open retropubic radical prostatectomy focusing in estimated blood loss, operative time and surgical margin status.

Methods: The authors reviewed medical history of 81 prostate cancer patients who were treated with open radical prostatectomy at Ramathibodi Hospital between January 1997 and August 2010. The patients were divided into 2 groups by BMI. The first group included patients with BMI < 25 kg/m^2 and the second group included patients with BMI ≥ 25 kg/m^2. Then preoperative, perioperative and pathological data of both groups were compared.

Result: There is no difference in estimated blood loss, operative time and surgical margin status between patients with BMI <25 kg/m^2 and patients with BMI ≥ 25 kg/m^2.

Conclusion: The present study shows that BMI was not the predictor of estimated blood loss, operative time and surgical margin status of open retropubic radical prostatectomy in prostate cancer patient.

Keywords: Radical prostatectomy, BMI, blood loss, operative time, surgical margin status

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Introduction

Today obesity is a major public health problem and is linked to several diseases[1]. Obesity has been suggested to be a risk factor for prostate cancer[2] and can effect treatment due to difficult access to pelvic cavity[3]. Several studies have shown that body mass index is predictive factors for perioperative and pathological outcome of open radical retropubic prostatectomy[4-6].

The objective of this study is to find the effect of BMI to surgical outcome such as estimated blood loss, operative time and surgical margin status in patient who underwent open radical prostatectomy in Ramathibodi Hospital.

Materials and Methods

The authors collected preoperative, perioperative and pathological data from 81 prostate cancer patients who underwent open radical retropubic prostatectomy in Ramathibodi Hospital from January 1997 - August 2010.

Open radical retropubic prostatectomy was done by surgeons with more than 10 years experience.

The patients were divided into 2 groups by BMI. The first group included patients with BMI < 25 kg/m^2 and the second group included patients with BMI ≥ 25 kg/m^2.

Preoperative data (age, prostate-specific antigen level, Gleason score from transurethral ultrasound-guided biopsy), perioperative data (estimated blood loss, operative time) and pathological data (surgical margin status) were analyzed.

The data collected from both groups were compared using the Student's t-test or the Mann-Whitney U test. Chi-square tests or Fisher's exact tests were used to compare the nominal data. Tests generating p-values of less than 0.05 were considered statistically significant.

Result

The number of subject that included in this study was 81 patients, 44 patients (54.32%) had BMI < 25 kg/m^2 and 37 patients (45.68%) had BMI ≥ 25 kg/m^2.

Pre-operative data (Table 1.) showed that there

Table 1 Preoperative data

	BMI < 25 (n = 44)	BMI ≥ 25 (n = 37)	p
Age (mean ± SD)	67.18 ± 6.83	67.27 ± 4.65	0.945†
PSA (median and range)	11.12 (3.8 - 108.4)	.5 (0.79 - 93)	0.324‡
No. Gleason score at biopsy (%)			0.333*
≤ 6	26 (59.1)	22 (59.5)	
7	14 (31.8)	8 (21.6)	
≥ 8	4 (9.1)	7 (18.9)	

† t-test; ‡ Mann-Whitney U test; * χ^2 test; BMI = Body Mass Index

Table 2 Perioperative data

	Mean ± SD		
	BMI < 25 (n = 44)	BMI ≥ 25 (n = 37)	p†
Estimate blood loss (ml)	1995.45 ± 1319.44	2381.08 ± 1361.95	0.200
Operative time (minute)	199.77 ± 77.33	232.57 ± 89.60	0.081

† t-test; BMI = Body Mass Index

was no statistically difference between two BMI groups in mean age (67.18 ± 6.83 years versus 67.27 ± 4.65 years), median PSA (11.12 ng/ml, range 3.8-108.4 ng/ml versus 11.5 ng/ml, range 0.79-93 ng/ml) and Gleason score from prostate biopsy (p=0.333).

Perioperative data (Table 2) showed that there was no difference between two BMI groups in mean estimated blood loss (1995.45 ± 1319.44 ml versus 2381.08 ± 1361.95 ml) and mean operative time (199.77 ± 77.33 minute and 232.57 ± 89.60 minute).

Pathological data (Table 3) showed that patients with BMI ≥ 25 kg/m^2 had higher pathological T stage than patients with BMI < 25 kg/m^2 (p = 0.012), but no significant difference in pathological N stage and surgical margin status.

Discussion

The gold standard in treatment of localized prostate cancer is radical prostatectomy even open or laparoscopic approach because it was proved by randomized control trial that it can reduce disease progression and cancer related death[7].

Basically this operation is complicate and there is the limitation of visual field due to deep pelvic anatomy. So we needed to prepare the blood component and the intensive care unit after the operation and we should aware about the common underlying diseases such as diabetes mellitus, coronary heart disease and chronic obstructive pulmonary disease. So the endocrinologist, cardiologist and pulmologist should be consulted before the operation.

To date, the understanding in periprostatic anatomy results in better surgical outcome[8]; however, the procedure also has complication. For example, the bleeding from dorsal venous plexus that may lead to more blood transfusion requirement and increase perioperative morbidity. In some studies BMI is the predictor of estimated blood loss in retropubic radical prostatectomy[4,5] but in this study BMI that was greater than 25 was not associated with the increase in EBL.

More operative time was associated with more

Table 3 Pathological data

	Number of patient (%)		
	BMI < 25 (n = 44)	**BMI ≥ 25 (n = 37)**	**p***
Pathologic T stage			0.012
T0	0 (0)	0 (0)	
T2a	0 (0)	1 (2.7)	
T2b	13 (29.5)	5 (13.5)	
T2c	10 (22.7)	17 (45.9)	
T3a	18 (40.9)	7 (18.9)	
T3b	3 (6.8)	6 (16.2)	
T4	0 (0)	1 (2.7)	
Pathologic N stage			0.198
N0	40 (90.9)	30 (81.1)	
N1	4 (9.1)	7 (18.9)	
Surgical margin status			0.460
Negative	33 (75)	25 (67.6)	
Positive	11 (25)	12 (32.4)	

* χ^2 test; BMI = Body Mass Index

exposure to anesthetic agent and more surgical cost[9]. The present study shows that there is no difference in operative time between the two groups. Surgical margin is an important factor used to predict bio-chemical recurrent and there have been many studies showing that BMI is associated with increased risk of positive surgical margin status and that biochemical failure[10-12] which correlated to the result of this study that there is no significant difference in surgical margin status.

Fortunately, most Thai people have small figure and the BMI is not as high as the western people. So the outcomes between two groups are not different in significance. Obesity can caused the operation more difficult due to limitation of working space and adipose tissue that obscure surgical plane.

The other minor factors that influence to the outcomes are the experience of surgeon and the stage of the cancer. In the early cases the bleeding volume and complications were slightly high when compare to the late cases.The patients who have received the antiandrogen or RHLH analog before the surgery tend to have the periprostatic fibrosis that caused the blood loss slightly increased.

Conclusion

The present study shows that BMI is not the predictor of the surgical outcome of open retropubic radical prostatectomy in Thai prostate cancer patient. Nevertheless the result of this study shows no different between the BMI but nowaday Thailand tends to be the medical hub so many foreign patients may come from western country then data may be changed in the future.

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