Minimally Invasive Surgery for Localized Prostate Cancer

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Abstract.
Prostate cancer is the most commonly diagnosed solid tumor cancer in both Europe and the US. Although there were previously low incidence and mortality rates of prostate cancer in Taiwan, these rates have risen rapidly in the past two decades. Options for minimally invasive surgical treatment of localized prostate cancer include laparoscopic radical prostatectomy (LRP), and robotic-assisted laparoscopic radical prostatectomy (RALP). Trends in treatment for localized prostate cancer after emergence of robotic-assisted laparoscopic radical prostatectomy were obvious. The percentage of RALP in patients with localized prostate cancer receiving radical prostatectomy is now about 70% in this institute. There is potential of robotic-assisted prostatectomy to become the mainstream treatment for localized prostate cancer in Taiwan. Twelve-month continence rates ranged from 66% to 95% after LRP. In terms of erectile function recovery, the 12- and 18-mo potency rates reported in noncomparative studies ranged from 42% to 76% after LRP. Better functional results were suggested following RALP. Excellent functional outcomes were reported in several large series from referral centers with high volume of RALP, showing continence rates ranging from 84% to 97% and potency rates from 70% to 80%. The positive surgical margin (PSM) rate was from 11% to 30% after LRP, and from 9.6% to 26% after RALP. Experience with 270 cases of RALP performed by single surgeon showed excellent continence rate and acceptable potency rate. There is still much room to improve cancer control by reducing the positive surgical margin rate.

Keywords: laparoscopy, prostate cancer, radical prostatectomy, robotics

局限性攝護腺癌之微創手術治療

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中文摘要
攝護腺癌在歐美是最常被診斷的惡性腫瘤，雖然在台灣攝護腺癌的發生率不高，但近 20 年逐漸升高。局線性攝護腺癌之微創手術包括：腹腔鏡及機械手臂根除性攝護腺切除，在本院接受根除性攝護腺切除術之病患，約有 70% 採用機械手臂切除攝護腺，機械
INTRODUCTION

Prostate cancer is the most commonly diagnosed solid tumor cancer in both Europe and the US. Taiwan has been an area of low clinical prostate cancer incidence. However, the incidence and mortality rates of prostate cancer in Taiwan, rates have risen rapidly in the past two decades. The incidence increased 17-fold from 1.45/100,000 in 1981 to 24.6/100,000 in 2008; mortality rate increased 10.4-fold from 0.8/100,000 in 1981 to 8.3/100,000 in 2006 [1]. The increase in prostate-specific antigen (PSA) use and screening, combined with a reduction in the threshold of indications for prostate biopsy and the greater number of samples taken, has contributed to an increase in the diagnosis of prostate cancer [2,3]. The majority of prostate cancer case are diagnosed with clinically organ-confined disease. This, in turn, has led to an increase in the number of candidates for radical prostatectomy (RP) [2,3].

Options for surgical treatment of localized prostate cancer include radical retropubic prostatectomy (RRP), laparoscopic radical prostatectomy (LRP), and robotic-assisted laparoscopic radical prostatectomy (RALP). Since 1980, when RRP was adopted by Walsh et al., the procedure has remained the gold standard for surgical treatment of localized prostate cancer [4]. LRP was first reported by Schussler et al. in 1992 [5]. Vallancien and Guillonneau performed LRP in 1998 and refined the technique [6,7]. However, LRP is a challenging surgical technique with a steep learning curve, requiring at least 60 cases to obtain proficiency [7].

Since the introduction of the da Vinci robotic system (Intuitive Surgical, Inc., Sunnyvale, CA) in 1999, urologists had tried to adopt it. The first RALP was performed by Binder and Kramer in Frankfurt in May 2000 [8]. Thereafter, Vattikuti Urology Institute at Henry Ford performed the procedure under the Vallancien’ training program in Oct. 2002, reporting a comparison of 48 LRP procedures and 50 RALP procedures [9]. When RRP was compared with RALP in the first 30 cases, preliminary results for RALP were comparable to the "best-in-class" values for LRP reported in the literature prior to that time [10]. Blood loss was minimal, and patients felt less pain and were discharged earlier from the hospital after RALP [11]. The learning curve for RALP was shown to be faster than that for LRP [11]. Ahlering et al. described the learning curve of a non-laparoscopic surgeon performing RALP in just 12 cases [12]. Eighteen operations were needed to complete the learning curve was reported by Wu et al. [13]. Patel et al. suggested that the learning curve for RALP was 25 cases [14,15]. Previously, we reported that surgeons gained familiarity with the basic technique with acceptable functional outcomes in about 30 cases [16].

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