

## Robotic Surgery for Early Prostate Cancer

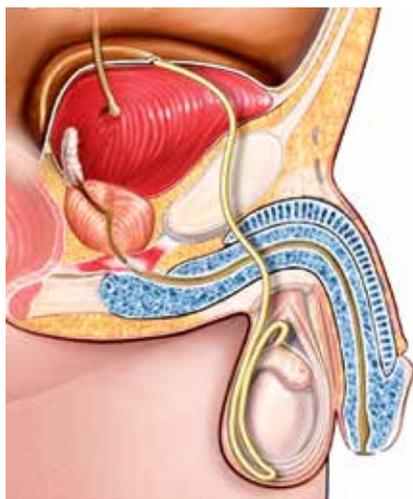
What you need to know

by Dr Gerald Tan

Most prostate cancer patients undergoing robotic surgery will experience significantly less bleeding and pain compared to conventional open surgery. In straightforward cases, patients are usually discharged from hospital two or three days after surgery.

**THE PROSTATE IS** a walnut-sized gland that is part of the male reproductive system, and is found below the bladder in the male pelvis (**Figure 1**). Prostate cancer remains the most common cancer affecting men in the United States, Europe, and Australia. It is the third most common cancer affecting men in Singapore, and is usually diagnosed in men above 50 years of age. Men with a positive family history of prostate cancer affecting their male relatives are at an increased risk of developing prostate cancer.<sup>1</sup>

Prostate cancer usually does not cause any symptoms in its early stages. It is detected on finding an abnormally raised serum prostate specific antigen (PSA) level, followed by an ultrasound-guided needle biopsy to confirm or exclude the presence of cancerous cells



**Figure 1.** The prostate gland is found below the urinary bladder deep in the male pelvis.



**Figure 2.** The da Vinci® Surgical System comprises a patient cart docked next to the patient on the operating table, while the surgeon operates from a console some distance away.

in the prostate. With PSA blood tests becoming easily accessible over the last 20 years, the majority of men with prostate cancer are now diagnosed at an early curable stage of their disease.

### What is robotic surgery?

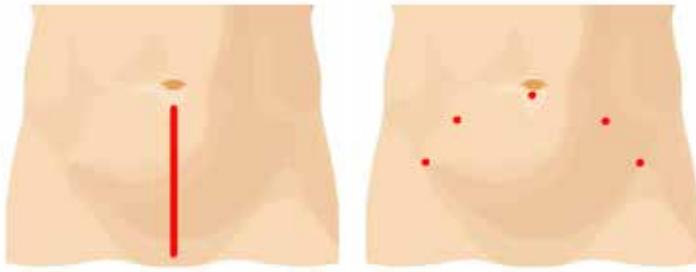
Robotic surgery refers to the use of a robotic surgical platform known as the da Vinci® Surgical System (Intuitive Surgical, Sunnyvale, USA) to perform minimally invasive surgery through small incisions. Since its inception in 2002, robotic prostatectomy has become hugely popular around the world. In Singapore and the United States, 90% of all surgeries to remove cancerous prostates are now performed using the da Vinci® robot.<sup>2</sup>

This innovative technology comprises a surgical cart that is docked next to the operating table to small ports placed through incisions of <1cm in the patient's abdomen. Robotic wristed instruments are then passed through these small ports into

the abdomen, which are controlled by the surgeon sitting at the operating console some distance away from the operating table (**Figure 2**). A binocular camera lens affords the surgeon a three-dimensional view of the operating field, which can be magnified up to 12 times. The surgeon then manipulates the camera lens and the various robotic instruments at the console using the hand controls and pedals. These specially designed instruments afford the surgeon excellent precision and dexterity of surgical movement because of their patented robotic wrist technology.

### What happens during robotic prostatectomy?

During robotic-assisted radical prostatectomy, the patient is put under general anaesthesia and surgical ports are placed through six keyhole incisions of <1cm made in the abdominal wall, through which the robotic instruments are passed (**Figure 3**). The bladder, prostate and seminal vesicles



**Figure 3.** Illustration of conventional scar versus robotic keyhole scars for prostate cancer surgery

- + Prostate cancer is one of the most common cancers affecting men today
- + Surgery to remove cancerous prostates is widely performed using robotic surgical instruments through minimally invasive approach
- + Robotic surgery in experienced hands delivers less pain, less blood loss, shorter hospital stay and earlier return of daily function compared to open surgery

are dissected free from surrounding structures. The vas deferentia (tubes carrying sperm from the testicles) are disconnected on both sides, and the prostate and seminal vesicles are removed after securing the blood vessels supplying these structures. The bladder is then sewn to the urethra using sutures, and a urinary catheter is left in the bladder for five to seven days to allow adequate healing.<sup>3</sup>

In cases of low-risk prostate cancer, surgeons usually attempt to spare the nerves controlling erectile function and urinary control during the surgery, to facilitate earlier recovery of these vital functions. Patients aged less than 65 years with no other significant health issues derive the most benefit from undergoing curative prostate cancer surgery.<sup>4</sup>

## How long will I be hospitalised after the surgery?

Most prostate cancer patients undergoing robotic surgery will experience significantly less bleeding and pain compared to conventional open surgery. In straightforward cases, patients usually return to the general ward on waking up. With the surgical incisions being small, there is usually little pain after the surgery, and patients are able to get out of bed and walk the following day. Patients are usually discharged after two or three days with an indwelling urinary catheter, which is removed around a week after surgery. They can expect to resume most normal activities of daily living and return to work two to three weeks after surgery.

## What are some of the side effects of robotic prostatectomy?

Some degree of urinary leakage is usually experienced after the catheter is removed a week after surgery, requiring patients to wear pads or diapers till their pelvic floor muscles become strong enough to resume adequate urinary control. With improved techniques of robotic surgery, most patients normally recover full urinary control within three to four months. Erectile dysfunction is another common side effect. However, this tends to take nine months or longer to resolve, due to injury to the nerves during pelvic surgery.

## My doctor told me that my prostate cancer is more aggressive than usual, and I should consider conventional open surgery or radiation instead. Am I still a suitable candidate for robotic prostatectomy?

In recent years, many centres have reported positive outcomes with robotic surgery for aggressive prostate cancer, with surgical margin and PSA recurrence rates similar to or better than open surgery.<sup>5</sup> In such high-risk patients, extended removal of the pelvic lymph nodes during surgery helps significantly reduce the likelihood of cancer recurrence. In patients whose laboratory report shows that the cancer has spread outside the prostate capsule or involved the attached seminal vesicles, a short course of adjuvant radiation may be necessary to achieve complete eradication of viable cancer cells in the pelvis.<sup>1</sup> eh

### References:

1. Mottet N, Bastian PJ, Bellmunt J et al. EAU 2014 Guidelines on prostate cancer. European Association of Urology. [http://www.uroweb.org/gls/pdf/09%20Prostate%20Cancer\\_LRLV2.pdf](http://www.uroweb.org/gls/pdf/09%20Prostate%20Cancer_LRLV2.pdf)
2. Tan GY, Goel RK, Kaouk JH, Tewari AK. Technological advances in robotic-assisted laparoscopic surgery. *Urologic Clinics of North America* 2009; 36: 237-49.
3. Tan GY, El Douaihy Y, Te AE, Tewari AK. Scientific and technical advances in continence recovery following radical prostatectomy. *Expert Review of Medical Devices* 2009; 6: 431-53.
4. Bill-Axelsson A, Holmberg L, Garmo H et al. Radical prostatectomy or watchful waiting in early prostate cancer. *New England Journal of Medicine* 2014; 370: 932-942.
5. Xylinas et al. Is radical prostatectomy a viable therapeutic option in clinically locally advanced cT3 prostate cancer? *British Journal of Urology International* 2010; 106: 1596-1600.



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