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.¹

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 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.²

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...
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.\(^3\)

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.\(^4\)

**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.

**In a Nutshell**

- **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.

**References:**


Dr Tan Yau Min, Gerald is a Consultant Urologist at Mt Elizabeth Hospital with over 17 years of clinical experience. He is internationally renowned for his expertise in minimally invasive and robotic surgery for prostate, kidney and bladder diseases. Dr Tan was one of the first surgeons to pioneer robotic nephron-sparing surgery in Asia, having performed the largest number of such surgeries in Mt Elizabeth Novena and Tan Tock Seng Hospitals to date. He has received numerous top international awards for academic and clinical excellence, and was named the Outstanding Young Urologist of Asia by the Urological Associations of Asia in 2012. He may be contacted via email at enquiries@drgeraldtan.com.sg.