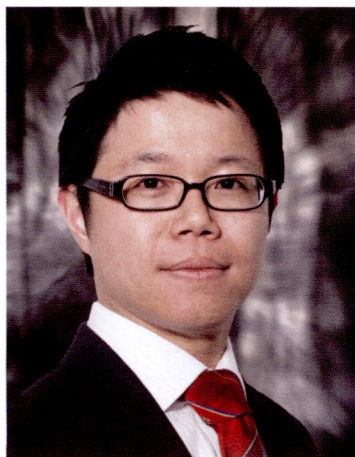


# Expanding use of the da Vinci Robot at St Vincent's for treatment of bladder cancer: robot-assisted radical cystectomy and urinary diversion



Dr Carlo Yuen

MBBS FRACS (Urology)

St Vincent's Hospital Urology Department Head  
Conjoint Senior Lecturer UNSW  
Suite 905, Level 9,  
438 Victoria Street, Darlinghurst NSW 2010  
P: 8382 6960 F: 8382 6448  
cyuen@stvincents.com.au



Dr David Ende

MBBS PhD FRACS (Urology)

Suite 905, Level 9,  
438 Victoria Street, Darlinghurst NSW 2010  
P: 8382 6976 F: 8382 6972  
dende@stvincents.com.au  
<http://www.endeurology.com.au/>

## Introduction

Robotic surgery has revolutionised cancer treatment over the past decade and has allowed us to perform increasingly complex operations by minimally invasive means.

St Vincent's Private Hospital Sydney was the first hospital in NSW to use the "state-of-the art" da Vinci SI system to perform Radical Cystectomy (removal of the bladder) with intracorporeal urinary diversion for the treatment of invasive bladder cancer.

## Invasive Bladder Cancer and its treatment

Each year over 2000 Australians are diagnosed with bladder cancer. There is no screening test for bladder cancer and the most common presenting symptom is blood in the urine. The risk of bladder cancer is associated with increasing age, cigarette smoking, male gender, phenacetin (Bex powder), aromatic amines, aniline dyes and radiation. Whilst most bladder cancers are superficial cancers (noninvasive) approximately 10 per cent-20 per cent are invasive and locally advanced at presentation. Local metastatic spread to surrounding lymph nodes, as well as distant metastases, make it a potentially lethal cancer if not treated early.

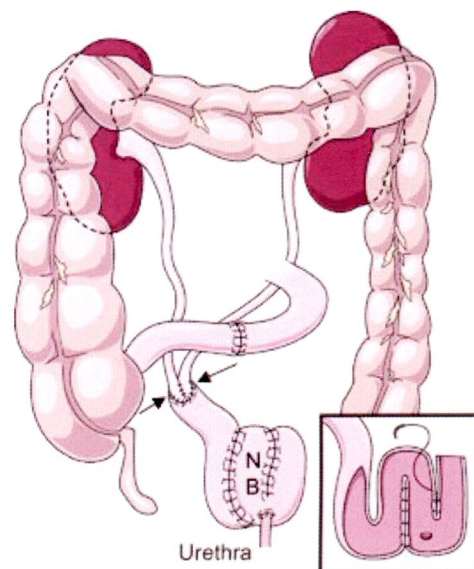
Surgery remains the standard of care for muscle invasive bladder cancer and may be used alone or in combination with chemotherapy and/or radiation. Neo-adjuvant chemotherapy has been shown to improve overall survival for locally advanced disease.

## Robotic Cystectomy and Urinary Diversion

Until recently the standard treatment for invasive bladder cancer was to remove the bladder and its lymph glands via a long (15-20cm) midline abdominal incision. The options for urinary diversions include: an ileal conduit (stoma), where a short segment of bowel is used as a conduit to drain urine from the kidneys to an external bag on the patient's abdomen; or a Neo-bladder, where a short segment of bowel is used to construct a reservoir which is then anastomosed onto the urethra (see Figure 1).

Figure 1

Robot-assisted radical cystectomy is a relatively new procedure that aims to significantly reduce the morbidity of the more traditional open procedure. Standard laparoscopic techniques have been attempted previously. However, due to the limitations of laparoscopic instruments making intracorporeal suturing extremely difficult and tedious, the procedure has not been widely performed. In most cases the urinary diversion part has therefore been performed via an open technique as a hybrid procedure, which defeats the purpose of minimally invasive surgery.

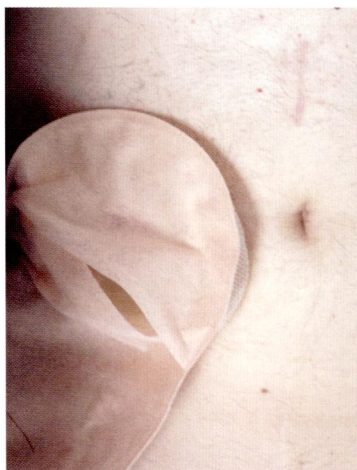


Robotic cystectomy utilises standard laparoscopic port sites similar to those used for radical prostatectomy. The technique of robotic cystectomy has been refined with the use of a motorised stapling device to allow improved haemostasis and the Airseal insufflation system that can maintain pneumoperitonium even with a significant air leak. This is particularly useful in female cystectomy where the specimen is retrieved via the vagina, leaving only the port site wounds. In male patients, the specimen is retrieved by enlarging the camera port in the upper abdomen, typically by no more than 3-4cm (see Figure 2).

Figure 2

Consequently, the analgesic requirement is significantly less compared with the open procedure.

There are several well defined surgical steps: six small skin incisions are made to allow the introduction of the robotic arms including the 3D camera and laparoscopic instruments; the bladder with the prostate and seminal vesicles (anterior vaginal wall in females) is freed from the surrounding structures by dividing its vascular pedicles; pelvic lymph node dissection is carried out up to the aortic bifurcation; a piece of small bowel is then selected and harvested on its mesenteric pedicle for formation of the conduit or neo-bladder, with the small bowel being reconstituted using a stapling technique; the ureters are anastomosed to the conduit or neo-bladder; and the stoma is then brought to the skin surface or the neo-bladder anastomosed to the urethra.



### Early Recovery After Surgery (ERAS) Protocol

The ERAS is a multimodal care pathway that aims to shorten recovery following surgical procedures by maintaining vital organ function and minimising the stress response following surgery. The key elements include preoperative counselling, optimising nutrition with carbohydrate loading and early enteral feeding, standardised analgesic and anaesthetic regimens including the avoidance of narcotics and early mobilisation.

Every effort is made to enhance recovery of bowel function, which is often the main reason for prolonged hospitalisation. We no longer use mechanical bowel preparation before surgery as it has been shown to delay return of bowel function. In addition, the intra- and post-operative fluid regime is also carefully rationalised to avoid overhydration, which may lead to prolonged paralytic ileus. Early feeding following bowel surgery has also been shown to hasten bowel recovery along with the use of pro-kinetics and chewing gum.

### The St Vincent's Robotic Experience

The robotic cystectomy program was introduced a year ago after visiting the University of Southern California (USC) Medical Centre where the technique was developed. Robotic cystectomy is an incredibly complex and sophisticated

procedure that is also technically demanding. It should only be performed by high volume surgeons in selected centres where there is a dedicated team. In setting up the program, we drew on our own experience and knowledge of robotic prostate and kidney surgery and we have used this as a platform to ensure the safe introduction of this new procedure.

We have now safely performed over 12 cases of robotic cystectomy with excellent oncological outcomes similar to the open technique. All had negative surgical margins except for one where the tumour was located at the trigone invading into the anterior rectum in the presence of a previous radical prostatectomy for prostate cancer. This series included nine males and three females with a median age of 76 years (range 61-87). The average operative time (console) was 5.9 hours, which is similar to the open procedure. The analgesic requirement was noticeably less and most patients required only oral analgesia by the second postoperative day. The majority of patients went home between days 7-10. One patient stayed for 21 days due to a urine leak that stopped with conservative management and a second patient (aged 85 years) stayed for 24 days waiting for rehabilitation. There were no major complications or unplanned returns to theatre or ICU admissions. One patient was readmitted within 30 days due to dehydration from *Clostridium difficile* infection. No patient required transfusion. One patient also underwent robotic nephroureterectomy at the same procedure for a concurrent renal transitional cell carcinoma and was discharged on day 7.

Whilst the cost of robotic surgery remains substantially higher than open surgery due to the cost of disposables, it is anticipated that this additional expense will be offset by the potential gain of reduced morbidity, shorter hospital stay and quicker return to normal activities.

### Conclusion

Robot-assisted radical cystectomy is a sophisticated and technically demanding operation that requires a dedicated team of highly skilled surgeons to ensure optimal outcomes and should only be performed in high volume centres. We are very proud to be now able to offer this procedure at St Vincent's Private Hospital Sydney.



St Vincent's Private Hospital  
406 Victoria Street, Darlinghurst, Sydney NSW  
P: 8382 7111



St Vincent's Clinic  
438 Victoria Street, Darlinghurst, Sydney  
P: 8382 6222

Source: - St Vincent's Clinic, Proceedings Volume 22 No: 1 October 2014