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Patient outcomes in the acute recovery phase following robotic-assisted prostate surgery: A prospective study

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Abstract

Background: Robotic-assisted minimally invasive urologic surgery was developed to minimise surgical trauma resulting in quicker recovery. It has many potential benefits for patients with localised prostate cancer over traditional surgical techniques without taking a risk with the oncological result.
Objectives: To report the specific surgical outcomes for the first Australian cohort of patients with localised prostate cancer that had undergone robotic-assisted radical prostatectomy (RARP) surgery. The outcomes represent the acute (in-hospital) recovery phase and include pain, length of stay (LOS), urinary catheter management and wound management.
Methods: Prospective descriptive survey of 214 consecutive patients admitted to a large metropolitan private hospital in Melbourne, Australia between December 2003 and June 2005. Patients had undergone RARP surgery for localised prostate cancer. Data were collected from the medical records and through interview at the time of discharge. Descriptive statistics were used to describe the frequency and proportion of outcomes. Patient characteristics were tabulated using cross tabulation frequency distribution and measures of central tendency.
Results: The findings from this study are highly encouraging when compared to outcomes associated with traditional surgical techniques. Transurethral catheter duration (median 7 days (*IQ* range 2)) and LOS (median 3 days (*IQ* range 2)) were considerably reduced. While operation time (median 3.30 h (*IQ* range 1.07)) was marginally reduced we would expect a further reduction as the surgical team becomes more skilled.
Conclusion: The findings from this study contribute to building a comprehensive picture of patient outcomes in the acute (in-hospital) recovery phase for a cohort of Australian patients who have undergone RARP surgery for localised prostate cancer. As such, these findings will provide valuable information with which to plan care for patients' who undergo robotic-assisted surgery.

Keywords: Prostatectomy; Nursing care; Outcomes research; Robotics; Surgery urologic male

What is already known about the topic?

- There will be an increase in the surgical application of minimally invasive technologies.
- The reported patient benefits of robotic technology include reduced length of patient stay, reduced posto-

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perative pain, reduced bladder catheterisation time and improved functional ability.

What this paper adds

- Reports on specific patient outcomes following robotic-assisted prostate surgery in the acute (in-hospital) recovery phase to:
  - commence building a comprehensive picture of the trajectory of recovery, and
  - allow hospitals to adapt their care and management protocols for this new patient group.

1. Introduction

The evolution of robots into the surgical arena has been due largely to the progression and subsequent difficulties associated with the use of minimally invasive (MIV) surgical techniques. The first robotic-assisted laparoscopic urologic surgical procedure reported in the literature was in 1995 (Abbou et al., 2001). The first totally endoscopic telerobotic radical prostatectomy surgery was first reported as being preformed in 2000 (Binder et al., 2004). This new technology driven procedure has spread rapidly over the last four years. Binder et al. reported that by 2004, 5200 radical prostatectomies (RPs) had been performed worldwide, making RPs the most frequent single surgical procedure performed with robotic assistance.

Our institution, one of the busiest network of hospitals in Australia, with 1000 beds and a staff of over 2000 across five campuses, was the first Australian hospital to implement robotic-assisted surgery using the da Vinci Robot for urology patients. In 2004, the first year that the hospital employed the use of the robot, 120 patients underwent robotic-assisted surgery for open radical prostatectomy for localised cancer. Robotic-assisted urologic surgery has many potential benefits. The system provides the surgeon with restoration of hand–eye coordination that was lost with MIV surgery. The instruments are easier to manipulate from an upright position at the console. The three-dimensional vision allows for depth and perception and high resolution video magnification thus improving precision (Kernstine, 2004; Lanfranco et al., 2004). The computer software of the robotic system allows elimination of hand tremors (Lanfranco et al., 2004; Mohr et al., 2001). The potential benefits for patients with localised prostate cancer include preservation of continence and sexual potency without comprising the oncological result. It is expected that the number of patients who undergo robotic urologic surgery will increase rapidly as surgeons become more proficient in using this new technology and patients become more aware of the potential postoperative benefits offered.

There are two forms of surgery for localised prostate cancer; open radical retropubic prostatectomy (RRP) and MIV, although RRP has been considered the gold standard in the management of prostate cancer. With the advancement of robotic-assisted surgery, there has been and will continue to be an increase in MIV surgery.

It has been demonstrated that robotic-assisted radical prostatectomy (RARP) surgery can significantly reduce patient length of stay (LOS), this change has implications for planning in-hospital care and discharge planning in order to prepare patients for both the intermediate and long-term phases of recovery.

2. Literature review

Prostate cancer, a disease that most often occurs in the older male (Crowe and Costello, 2003) is the second most common cause of cancer related deaths in men and is a major health concern worldwide (Humphreys et al., 2004). It is the most common form of cancer among men over 55 years of age (Jemal et al., 2002). In Australia, prostate cancer is the most commonly diagnosed cancer in males and is the leading site of new cancer in Victoria in 2003. In 2003, prostate cancer was diagnosed in 3441 men in Victoria (Anti-Cancer Council of Victoria, 2005). In light of the ageing of the Australian population the incidence of prostate cancer will rise. Deciding the best treatment for prostate cancer is a challenge for the consumer as there is a range of treatment modalities available including surgery, radiotherapy and hormone therapy. Radical prostatectomy surgery (major surgery removing the entire prostate gland plus some surrounding tissue) is generally performed and considered effective when cancer is confined to the prostate gland (Prostate Cancer Institute, 2005).

Traditionally, radical prostatectomy surgery was routinely performed using the standard open retropubic technique approach (prostate gland is removed through an incision in the lower abdomen). Generally, radical prostatectomy is recommended only for men in good health who have a life expectancy of 10 years or more. Studies of men with localised prostate cancer, typically treated by prostatectomy, indicate that post surgery specific problems in particular, urinary incontinence and impotence persist following the surgery (Litwin et al., 1995; Stanford et al., 2000).

Urinary incontinence after open radical prostatectomy, which may be serious enough to have a substantial impact on quality of life, occurs as a result of damage to the urinary sphincter at the time of surgery. Because the external sphincter tends to be less efficient in older males the rate of incontinence is higher in patients over 70 years of age (Burnett and Mostwin, 1998; Eastam et al., 1996). According to Grise and Thurman (2001) post prostatectomy urinary incontinence is reported in the literature as occurring in 25–70% of cases. Donnellan et al. (1997) prospectively studied the rate and degree of incontinence after radical prostatectomy found significant incontinence occurred in as many as 10% of patients.

Similarly, impotence following open radical prostatectomy has been found to have a substantial impact on this