Robot-assisted laparoscopic prostatectomy – Impact on LUTS

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Introduction[1]

Robot-assisted radical prostatectomy (RARP) has emerged as a sophisticated and minimally invasive surgical technique for the treatment of localized prostate cancer. The evolution of robotic surgery has provided significant advancements in precision, skill, and control, surpassing the capabilities of traditional open and laparoscopic methods. This technique involves using a robotic system to enhance the surgeon's ability to perform intricate dissections and reconstructions with greater accuracy and less invasiveness. Ideal candidates for RARP are those with localized prostate cancer, good overall health, and no contraindications to robotic surgery. The procedure typically includes preoperative planning with imaging studies and patient counseling, meticulous surgical steps such as bladder mobilization, nerve-sparing dissection, vesicourethral anastomosis, and thorough postoperative care to ensure optimal outcomes. With the potential for reduced blood loss, quicker recovery times, and preservation of urinary and sexual function, RARP represents a significant advancement in the surgical management of prostate cancer.

Advantages of Robot-Assisted Radical Prostatectomy[1]

Robot-assisted radical prostatectomy (RARP) offers several significant advantages over traditional open and laparoscopic techniques for treating localized prostate cancer:

1. **Enhanced Precision:**
   - **Robotic Instruments:** Greater range of motion and tremor filtration lead to precise movements and fine dissections.
   - **Tremor Filtration:** Smoother, more controlled movements enhance surgical accuracy.
2. **Improved Visualization:**
   - **3D High-Definition Imaging:** Provides a clear, magnified view of the surgical field, aiding in identifying anatomical structures and accurate dissection.
   - **Magnification:** Allows surgeons to see fine details, crucial for nerve-sparing techniques.
3. **Minimally Invasive Approach:**
   - **Smaller Incisions:** Reduces trauma to the body compared to open surgery.
   - **Reduced Blood Loss:** This leads to less intraoperative blood loss and lower transfusion requirements.
4. **Reduced Postoperative Pain and Faster Recovery:**
   - **Less Pain:** Smaller incisions result in less postoperative pain.
   - **Quicker Recovery:** Patients typically experience shorter hospital stays and faster return to normal activities.

5. **Oncological and Functional Outcomes:**
    - **Effective Cancer Control:** RARP effectively removes localized prostate cancer.
    - **Preservation of Function:** Precision aids in nerve-sparing techniques, preserving erectile function and urinary continence.
6. **Decreased Risk of Complications:**
    - **Lower Infection Rates:** Smaller incisions and less tissue trauma reduce infection risk.
    - **Fewer Complications:** Minimally invasive approach leads to fewer overall complications.
7. **Surgeon Ergonomics:**
    - **Improved Ergonomics:** The robotic console allows surgeons to operate comfortably, reducing physical strain and fatigue, which can improve performance.

Clinical evidence

Impact of robot-assisted radical prostatectomy on lower urinary tract symptoms and quality of life[2]

Urinary incontinence is a significant concern for patients undergoing radical prostatectomy. Despite this, many patients experience improvement in lower urinary tract symptoms (LUTS) following the procedure, which can alleviate some of these concerns. This study uses the International Continence Society male questionnaire (ICSMALESF-Q) to assess LUTS and its impact on quality of life (QoL) before and after robot-assisted radical prostatectomy (RARP).

Objective

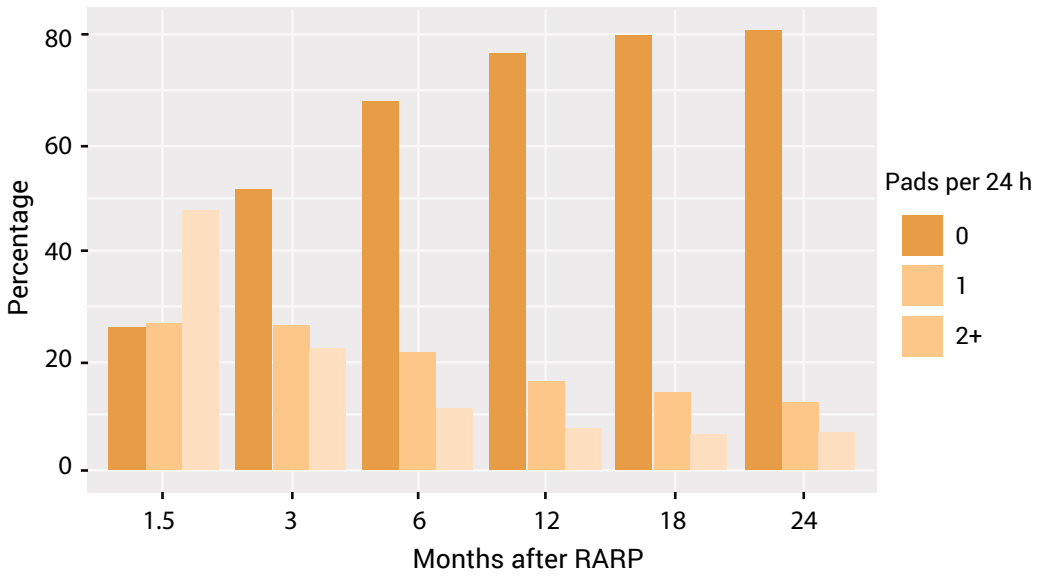
To evaluate LUTS and QoL changes associated with RARP and to identify risk factors contributing to postoperative urinary incontinence.

Methods

- **Study Design:** Prospective data collection from 2009 to 2014
- **Participants:** 453 patients who underwent RARP with preoperative and at least two postoperative ICSMALESF-Q datasets
- **Data Collection:** Preoperative and postoperative assessments of LUTS and QoL using ICSMALESF-Q
- **Outcome Measures:** LUTS changes and daily pad use

Results

- ICSMALESF-Q scores showed significant improvement at 6 months post-RARP ($P<0.001$).
- Quality of life related to LUTS significantly improved at 12 months post-RARP ($P<0.01$).
- Two years after RARP, LUTS improved in 64% of patients, remained unchanged in 18%, and worsened in 18%.
- 79% of patients did not use any pads daily.
- 95.6% of patients used either 0 or 1 pad daily.
- Increased age was associated with a higher average number of pads used per day, with a multiplicative effect of +2.1% pads per year ($P<0.05$).
- Being in the D'Amico low-risk group reduced the average number of pads used by 22% ($P<0.05$).



RARP: robot-assisted radical prostatectomy

Figure 1. Pads used per day postoperatively

Conclusion

The ICSMALESF-Q results indicate significant improvement in LUTS for most patients following RARP, leading to enhanced QoL. Being in the preoperative D'Amico low-risk group was associated with reduced pad use post-RARP, whereas increased age correlated with higher postoperative pad use.

These findings can help health providers counsel patients more effectively before prostatectomy by addressing not only pad use and incontinence but also changes in the bothersomeness of LUTS and associated risk factors.

References

1. Huynh LM, Ahlering TE. Robot-Assisted Radical Prostatectomy: A Step-by-Step Guide. *J Endourol.* 2018;32(S1):S28-S32.

2. Dommer L, Birzele JA, Ahmadi K, Rampa M, Stekhoven DJ, Strebel RT. Lower urinary tract symptoms (LUTS) before and after robotic-assisted laparoscopic prostatectomy: does improvement of LUTS mitigate worsened incontinence after robotic prostatectomy? *Transl Androl Urol.* 2019;8(4):320-328.