Report on Biochemical Recurrence Rates After Robotic Radical Prostatectomy

Robotic assisted radical prostatectomy (RALP) is a minimally invasive alternative to traditional radical prostatectomy (RP). Over 80% of U.S. prostatectomies as a treatment for prostate cancer are now done by robotic-assisted laparoscopic surgery. However, there is a steep learning curve; it is estimated that RALP may not deliver comparable results with RP until a surgeon has done 150-250 procedures. (Herrell & Smith, 2005) Even then, studies are needed to explore the actual cancer control statistics on RALP.

A 2012 report of recurrence rates after RALP was conducted through the University of Connecticut Health Center and Hartford Hospital using a database of 1159 cases. (Ginzburg et al, 2012) Patients were treated between 2003-2009. Mean follow-up was 15.9 months. All RALP procedures were performed by 1 of 3 surgeons using DaVinci robotic surgical systems; one of the surgeons was still in his learning curve at the start of data collection. All pretreatment demographic and clinical information had been entered into the database. Patients were classified as low, intermediate and high risk according to the D'Amico criteria.

To determine the risk of recurrence (return of prostate cancer) after gland removal, the surgical margins of the removed glands were examined for presence of residual cancer. A negative surgical margin indicates that the pathologist did not detect any cancer present. A positive surgical margin denotes tumor that extends to the surgical edge of the removed gland, implying that residual cancer remains after the surgery. Thus, it is a significant risk factor for recurrence. (Ahlering)

Of the 1159 patients, 316 were determined to have positive margins for an overall population rate of 27.3%. As might be expected, patients classified as low risk had lower rates of positive margins, and the rate increased with greater risk levels as shown in Table 1:

D'Amico risk class	Positive margin
Low (PSA<10ng/mL, Gleason score<7, stage<cT2b)	131 patients (23.0%)
Intermediate (PSA 10-20ng/mL, Gleason score=7)	132 patients (28.6%)
High (PSA>20ng/mL, Gleason score 8-10)	53 patients (41.7%)
Pathologic stage	
T0-T2N0M0	183 patients (20.3%)
T3aN0M0	101 patients (53.2%)
T3b and T4N0M0	25 patients (50.0%)
TxN1Mx (positive lymph nodes)	7 (46.7%)

Table 1. Rate of positive margins among 316 patients by risk level and pathologic stage

In addition to the presence of positive margins, postoperative PSA values were routinely obtained at 1, 3, 6, 9, 12, 18, and 24 months and once per year thereafter. Biochemical recurrence (BCR) was defined as a PSA of ≥0.2ng/mL. Statistical curves projecting rates of biochemical disease-free survival were generated out to 60 months, showing that rates of BCR were greater for those with positive surgical margins than for those with negative surgical margins. The cumulative rate of biochemical recurrence-free survival at 60 months was 72% (meaning that within 5 years 28% of all patients had evidence of biochemical recurrence. Patients with negative surgical margins had lower rates of BCR throughout the study period, but this is consistent with observations that "...patients with pathologic Gleason score <7 had a significantly delayed BCR as compared with those with Gleason score ≥7." (Ginzburg p.448) Thus, the authors state that the 60 month period may be limitation of the study as data was not available on BCR beyond 60 months. The table below shows their post-RALP cumulative biochemical recurrence-free survival rates over the 5 year study period:

Year	Biochemical recurrence-free survival
1	93.3%
2	90.6%
3	86.2%
4	79.7%
5	72.0%

The authors conclude that their BRFS rates are comparable to those reported by other authors, offering three other studies for comparison:

- 74% for robotic-assisted laparascopic RP
- 73.1% for laparascopic RP
- 75.4% for open RP

The authors' data confirms that positive surgical margins posed a significantly greater risk for biochemical recurrence than negative margins, and that their cancer control rates for RALP are commensurate with other RP approaches.

References
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3. Herrell SJ, Smith J. Robotic-assisted laparoscopic prostatectomy: what is the learning curve? Urol 2005 Nov;66 Supp:105-7.