Robotic Assisted Radical Prostatectomy: Learning curves and outcomes from an Australian perspective

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INTRODUCTION

Demonstrated correlation between operator experience and surgical outcomes
High degree of variability in international studies
- 80 – 250 cases required for positive or improved surgical outcomes

Primary outcomes
- Operating time (OT)
- Estimated blood loss (EBL)
- Positive surgical margins (PSM)

Longitudinal improvement
No Australian, multiple surgeon cohort studies

AIM

Demonstrate how the learning curve in RARP can affect primary surgical outcomes in a high volume, Australian centre with a cohort of multiple surgeons

METHOD

Retrospective Audit – Epworth Healthcare
2016 - 2021
RARP +/- PLND +/- NS
Exclusion: intraoperative complications, multiple surgeons involved
Positive primary outcomes:
- OT <240min
- EBL <310ml
- Negative surgical margins

Table 1. Mean primary outcomes cohort vs high volume

Means	Operating time (min)	Blood loss (mL)	PSM	Transition point (cases)	Total cases	Surgeons
Cohort	229	353	15%	-	3969	53
High volume	240	302	6%	65	3413	24

RESULTS

- 3969 total cases included
- 53 surgeon cohort
- 24 surgeons performed >50 RARP
- Transition point:
  - Cases required to achieve at least 2 positive primary outcomes >50% of the time
- Varying transition points
  - Mean transition point of 65 cases for high volume Epworth cohort

In 5 years;
- OT: 1% reduction
- EBL: 13% reduction
- PSM: 11% Absolute risk reduction (OR 0.34, (0.26 – 0.45, 95% CI) (P<0.0001)

Factors affecting outcomes;
- Patient demographic
- RARP +/- PLND +/- NS
- Prostate volumes and grade of malignancy
- Docking time
- Internationally; Skin to skin operating time
- Different patient demographic
- ARR for PSM 13.5% (minimum 250 cases)[1]

Figure 1. High volume surgeon transition points

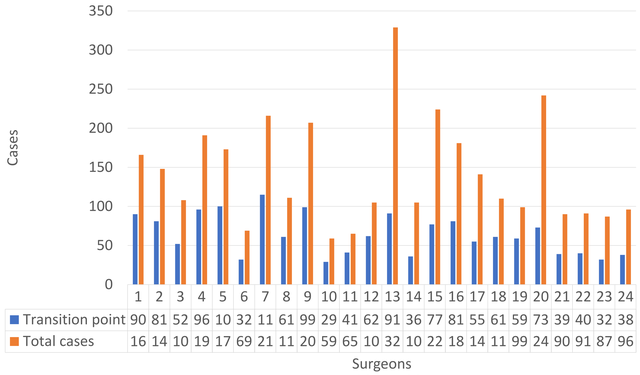


Figure 2. Median operating time

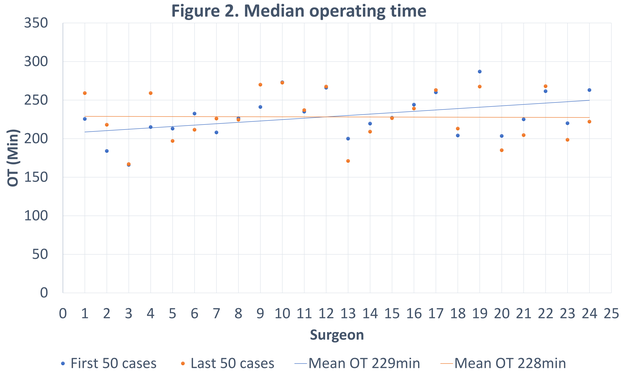


Figure 3. Mean estimated blood loss

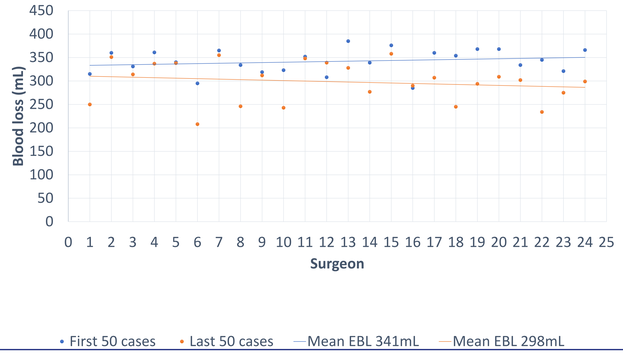
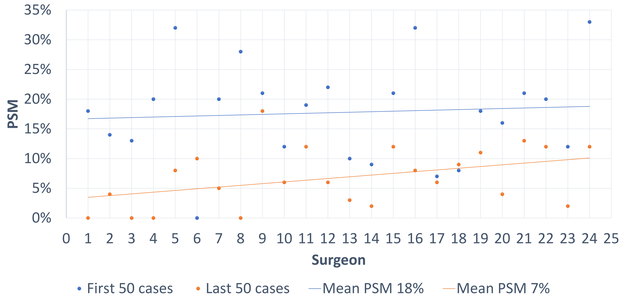


Figure 4. Positive surgical margins



CONCLUSIONS

High volume surgeons demonstrate a reduction in EBL and absolute risk reduction in PSM over 5 years.
The mean transition point for RARP is 65 cases.
Primary outcomes are highly susceptible to the patient demographics.
Surgeon experience significantly impacts the rate of PSM.
Regression analysis is required to assess the effect of learning curve time with intraoperative variables.

REFERENCES

1.Bravi CA, Tin A, Vertosick E, Mazzone E, Martini A, Dell'Oglio P, et al. The Impact of Experience on the Risk of Surgical Margins and Biochemical Recurrence after Robot-Assisted Radical Prostatectomy: A Learning Curve Study. The Journal of Urology. 2019;202(1):108-13.

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