

Editorial submission for: Variation in the Costs of Radical Cystectomy for Bladder Cancer in the USA

Factors affecting Cost of Radical Cystectomy in the USA: some centres are more equal than others!

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The cost of bladder cancer care in the USA in 2010 was \$4 billion, making it the 9th most expensive cancer to manage, and this is projected to rise to \$5.7 billion by 2020 [1]. In this month's issue of *European Urology*, Leow et al. report the variance in cost of delivering radical cystectomy (RC) using healthcare database records across centres in the USA [2].

Data was extracted from the Premier Healthcare Database for 53 473 patients who underwent RC during a 13-year period (2003-2015) under the care of 2 317 surgeons in 425 hospitals. The primary aim was to analyse direct costs attributed to RC and the ensuing 90 post-operative days, and identify variables contributing to cost variance. Based on their robust multivariate logistic regression model, the authors concluded that postoperative complications, Charlson comorbidity index and year RC was performed were predictors of high cost (>90th percentile). The authors acknowledge limitations of using the Premier Healthcare Database, but the study offers an important perspective on cost of RC.

Multiple studies have established the volume-outcome relationship for RC in which high-volume centres have significantly less complications [3]. Indeed, an analysis of Premier Healthcare Database (2003-2010) by the same research group concluded that surgical volume was inversely related to direct hospital costs and post-operative 90-day complication rates [4]. In the current analysis, Loew and colleagues report that complications were the largest contributing factor to cost variation. While it would seem reasonable to expect that high-volume centres and high-volume surgeons would have reduced complications and be less costly, this relation was not observed.

One reason for this discrepancy could be that the base cost for RC varies by centre in the USA, and a standardised measure of cost such as Relative Value Units was not applied. Another factor to be considered is the definition of "high" volume centres and "high" volume surgeons as performing ≥ 22 and ≥ 6 RC per year respectively. While it is practical to split data by quartiles to derive the definition of volume, it does raise the question whether designating arbitrary thresholds will mask an otherwise observable relationship. In their previous study [5], the authors introduced the concept of highest volume surgeons (performing ≥ 28 RC per year) in which volume-outcome relation was demonstrated. Although the current study sets out to answer a different question, using previously applied definitions would lend further credence to their conclusions.

By comparison, a mandatory National UK database describes high volume centres as >60 RC per year and high-volume surgeons as >30 RC per year. Such widely varying definitions of high-volume make it difficult to extrapolate their results to other healthcare systems.

Leow et al. also show that there is no relation between cost and the surgical approach of open or robotic RC. The finding that the direct costs attributed to robotic surgery do not impact the cost variance is perhaps not so surprising given the impact of the other, more significant factors, which this study has identified. It will be important and of interest in future studies to determine whether the direct costs of robotic surgery are offset by factors such as transfusion rate, length of stay and the potential advantage of using the robotic approach for patients with poor performance status [6]. Also, the influence of potential confounding factors such as the effect of enhanced recovery after surgery (ERAS) [7,8], chemotherapy and case-mix will provide a greater granularity to inform policy decisions.

A by-product of this study is the striking observation that a staggering 57% of all RC were performed by surgeons undertaking ≤ 2 RCs/year. In contrast, the National UK database shows that less than 5% of RC was performed by surgeons undertaking <8 RC in 2014-2015 and 56% of RC were performed by surgeons who undertook >30 RC per year. In an era where the volume relation is established for RC [3], the move towards centralisation needs to be a global priority. Leow et al. observed that year of surgery contributed to observed variation in cost and it will be interesting to explore whether recent trends favouring centralisation could explain why outlier costs for RC performed in 2011-2015 are magnitudes lower than 2003-2006 in this report.

This study tells us that there is significant variation in RC costs in the USA healthcare system. The variance could reflect disparity in care, and this warrants further investigation. The results can inform policy and as highlighted by the authors, the introduction of bundled payment schemes could alter practice, potentially encouraging a move towards centralisation but risks creating a cream skimming phenomenon. The onus on Us a surgical community is to avoid the latter.

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