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European Association of Urology

Platinum Priority – Prostate Cancer

Editorial by Derya Tilki, Hartwig Huland and Markus Graefen on pp. 30–31 of this issue

Achieving Quality Assurance of Prostate Cancer Surgery During Reorganisation of Cancer Services

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Article info

Article history:
Accepted February 25, 2015

Keywords:
Prostate cancer
Radical prostatectomy
Outcomes research
Quality of care

Abstract

Background: National Health Service England recently oversaw a whole-scale reconfiguration of cancer services in London, UK, for a number of different cancer pathways. Centralisation of cancer surgery has occurred with prostate cancer (PCa) surgery only being commissioned at a single designated pelvic cancer surgical centre. This process has required surgeons to work in teams providing a hub-and-spoke model of care.
Objective: To report the extent to which the initiation of a quality assurance programme (QAP) can improve the quality of PCa surgical care during reorganisation of cancer services in London.
Design, setting, and participants: A pre- and postintervention study was initiated with 732 men undergoing robot-assisted radical PCa surgery over a 3-yr period, 396 men before the introduction of the QAP and 336 afterwards.
Intervention: Image-based surgical planning of cancer surgery and monthly peer review of individual surgeon outcomes incorporating rating and assessment of edited surgical video clips.
Outcome measurements and statistical analysis: We observed margin status (positive/negative), complication rate of surgery, 3-mo urinary continence, use of nerve-sparing surgery, and potency at 12 mo after surgery. Multivariable logistic regression modelling was used to compare outcomes before and after initiation of the QAP. Cox regression analysis was used to evaluate the return of potency over time.
Results and limitations: Demographics of patients undergoing surgery did not change following the reorganisation of cancer services. Patient-reported 3-mo urinary continence improved following the initiation of the QAP, both in terms of requirement for incontinence pads (57% continent vs 67% continent; odds ratio [OR]: 2.19; 95% confidence interval [CI], 1.08–4.46; $p = 0.02$) and International Consultation on Incontinence Questionnaire score (5.6 vs 4.2; OR: 0.82; 95% CI, 0.70–0.95; $p = 0.009$). Concurrently, use of nerve-sparing surgery increased significantly (OR: 2.99; 95% CI, 2.14–4.20; $p < 0.001$) while margin status remained static. Potency at 12 mo increased significantly from 21% to 61% in those patients undergoing bilateral nerve-sparing surgery (hazard ratio: 3.58; 95% CI, 1.29–9.87; $p = 0.04$). Interaction was noted between surgeon and 3-mo urinary continence. On regression analysis, incontinence scores improved significantly for all but one surgeon who had low incontinence rates at study initiation.

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http://dx.doi.org/10.1016/j.eururo.2015.02.028

Conclusions: The implementation of a QAP improved quality of care in terms of consistency of patient selection and outcomes of surgery during a period of major reorganisation of cancer services in London. The QAP framework presented could be adopted by other organisations providing complex surgical care across a large network of referring hospitals.
Patient summary: The introduction of a quality assurance programme improved the quality of prostate cancer care in terms of consistency of patient selection and outcomes of surgery during a period of major reorganisation of cancer services.

1. Introduction

Prostate cancer (PCa) services in England have undergone wide-scale reorganisation since the publication in 2002 of "Improving Outcomes in Urological Cancers Guidelines" by the National Institute of Clinical Excellence, now the National Institute for Health and Care Excellence. In these guidelines, it was suggested that radical surgery for PCa be provided by teams typically serving populations of at least ≥1 million and those carrying out a cumulative total of at least 50 pelvic cancer surgeries each year [1].

In the late 2000s, a review of National Health Service (NHS) services in London, UK, identified that London had some of the worst cancer clinical outcomes in the country [2]. To improve cancer survival in the capital, it was recommended that cancer care undergo radical reorganisation. As a result, London Cancer, an administrative body created to oversee the introduction of a new integrated cancer system, was established [3,4].

One objective of London Cancer was the development of individual cancer pathways that would aim to optimise the quality of care for people with suspected cancer in the capital, a population of 4 million residents. In total 11 different cancer pathways have been developed to date of which urologic cancer encompassing kidney, bladder, penis, and prostate is one.

Following a review process for PCa care, it was decided to centralise radical PCa surgery from nine smaller hospitals to a single large pelvic cancer surgical centre that would perform all the major complex urologic cancer surgeries for the region [5]. This centralisation process, commissioned by NHS England, was argued on the basis that higher volume PCa surgical centres have improved outcomes [6–9].

Such a process of reorganisation required surgeons across the London Cancer network to split their work between the local hospital and the pelvic cancer surgical centre. This hub-and-spoke model of care, already popularised in other areas such as vascular surgery [10,11], generated a new and unique challenge in regard to the need for quality assurance of PCa surgery provision.

In response, a quality assurance programme (QAP) incorporating image-based surgical planning of cancer surgery and monthly peer review of individual surgeon outcomes including rating and assessment of edited surgical video clips was initiated whose aim was to ensure a high quality of care for patients undergoing radical PCa surgery. We report the impact of the QAP on the quality of PCa surgical care provided to patients within the London Cancer network.

2. Methods

Outcomes of PCa surgery were compared before and after the implementation of a QAP to determine if the intervention (the QAP) had an impact on outcome (pre- and postintervention study). The QAP was initiated due to the need for quality assurance of radical PCa surgery during a period of reorganisation of PCa services.

2.1. Patient population

The patient population included 396 successive men undergoing robot-assisted PCa surgery between September 2010 and June 2013 before the introduction of the QAP in addition to 336 successive men undergoing robotic PCa surgery thereafter (from June 2013 to October 2014). No differences in the patient and disease demographics were noted before and after the introduction of the QAP (Table 1).

2.2. Surgeons

Before the reorganisation of PCa services, two established surgeons with an annual case volume of >50 robotic PCa procedures per year performed robot-assisted PCa surgery at the hospital subsequently designated as the pelvic cancer surgical centre. Reorganisation of cancer services resulted in two additional surgeons working in both their local centre and the pelvic cancer surgical centre. One of these surgeons was an established robotic surgeon, again performing >50 procedures per year; the other was robot naive but had extensive open PCa surgical experience. An additional surgeon was appointed at the time of reconfiguration who was fellowship trained in robotic surgery.

2.3. Intervention

The QAP consisted of two interventions: (1) image-based surgical planning of PCa surgeries and (2) monthly peer review of individual surgeon outcomes including the assessment of edited surgical video clips.

2.4. Image-based surgical planning

All patients booked for radical PCa surgery were automatically scheduled for review in a weekly image-based surgical planning meeting. This meeting was attended by at least one PCa surgeon and an experienced uroradiologist specialist in multiparametric prostate magnetic resonance imaging (MRI). A surgical planning proforma (standard form) (Supplemental Fig. 1) was completed for each patient. It included details concerning preoperative sexual and urinary function captured using validated patient-reported outcome measures (PROMS), comorbidities, prior surgical history, and detailed mapping of prostate biopsy histology presented in diagrammatic form.

At the image-based surgical planning meeting, the patient's prostate imaging, predominantly MRI but also choline positron emission