

Original article

Benefits of robotic cystectomy with intracorporeal diversion for patients with low cardiorespiratory fitness: A prospective cohort study

Benjamin Wilfrid Lamb, M.B.B.S., M.A., Ph.D., F.R.C.S. (Urol.)^{a,b,*},
Wei Shen Tan, B.Sc., M.B.B.S., M.R.C.S.^c, Philip Eneje, M.B.B.S.^d, David Bruce, B.Sc.^e,
Amy Jones, B.Sc.^e, Imran Ahmad, M.B.Ch.B., B.Sc., M.R.C.S., Ph.D., F.R.C.S. (Urol.), F.E.B.U.^{a,f,g},
Ashwin Sridhar, M.B.B.S., M.R.C.S., M.Sc.^a, Hilary Baker, B.Sc., M.Sc., R.G.N.^a,
Tim P. Briggs, B.Sc., M.S., F.R.C.S. (Urol.)^{a,h}, John E. Hines, F.R.C.S. (Urol.)^{a,i},
Senthil Nathan, M.S., F.E.B.U., F.R.C.S.(Urol.), M.Phil.(Urol.)^a,
Daniel Martin, F.R.C.A., F.F.I.C.M.^{e,j},
Robert C. Stephens, B.A., M.D., F.R.C.A., F.F.I.C.M.^e, John D. Kelly, M.D., F.R.C.S. (Urol.)^{a,c}

^a Department of Urology, University College London Hospitals NHS Foundation Trust, London, UK

^b Department of Surgery and Cancer, Centre for Patient Safety and Service Quality, Imperial College London, London, UK

^c Division of Surgery and Interventional Science, University College London, London, UK

^d Royal Free and University College London Medical School, London, UK

^e Department of Anaesthesia, Royal Free Perioperative Research group, Royal Free Hospital, London, UK

^f Cancer Research UK Beatson Institute, Glasgow, UK

^g Institute of Cancer Sciences, University of Glasgow, Glasgow, UK

^h Department of Urology, Royal Free Hampstead NHS Foundation Trust, London, UK

ⁱ Department of Urology, Whipps Cross University Hospital, Barts Health NHS Trust, London, UK

^j UCL Division of Surgery and Interventional Science, Royal Free Hospital, London, UK

Received 9 December 2015; received in revised form 9 March 2016; accepted 11 April 2016

Abstract

Background: Patients undergoing radical cystectomy have associated comorbidities resulting in reduced cardiorespiratory fitness. Preoperative cardiopulmonary exercise testing (CPET) measures including anaerobic threshold (AT) can predict major adverse events (MAE) and hospital length of stay (LOS) for patients undergoing open and robotic cystectomy with extracorporeal diversion. Our objective was to determine the relationship between CPET measures and outcome in patients undergoing robotic radical cystectomy and intracorporeal diversion (intracorporeal robotic assisted radical cystectomy [iRARC]).

Methods: A single institution prospective cohort study in patients undergoing iRARC for muscle invasive and high-grade bladder cancer. Inclusion: patients undergoing standardised CPET before iRARC. Exclusions: patients not consenting to data collection. Data on CPET measures (AT, ventilatory equivalent for carbon dioxide [VE/VCO₂] at AT, peak oxygen uptake [VO₂]), and patient demographics prospectively collected. Outcome measurements included hospital LOS; 30-day MAE and 90-day mortality data, which were prospectively recorded. Descriptive and regression analyses were used to assess whether CPET measures were associated with or predicted outcomes.

Results: From June 2011 to March 2015, 128 patients underwent radical cystectomy (open cystectomy, $n = 17$; iRARC, $n = 111$). A total of 82 patients who underwent iRARC and CPET and consented to participation were included. Median (interquartile range): age = 65 (58–73); body mass index = 27 (23–30); AT = 10.0 (9–11), Peak VO₂ = 15.0 (13–18.5), VE/VCO₂ (AT) = 33.0 (30–38). 30-day MAE = 14/111 (12.6%); death = 2, multiorgan failure = 2, abscess = 2, gastrointestinal = 2, renal = 6; 90-day mortality = 3/111 (2.7%).

Funding and support were received from UCL Division of Surgery and Interventional Science, the National Institute for Health Research (NIHR) University College London Hospitals (UCLH) Biomedical Research Center, Imperial Patient Safety Translational Research Center, which is funded by the NIHR Biomedical Research Centre at UCLH, NHS Foundation Trust and University College London, United Kingdom.

* Corresponding author. Tel.: +44-203-456-7890.

E-mail addresses: ben.lamb@nhs.net, benjamin.lamb@imperial.ac.uk (B.W. Lamb).

AT, peak VO_2 , and VE/VCO_2 (at AT) were not significant predictors of 30-day MAE or LOS. The results are limited by the absence of control group undergoing open surgery.

Conclusions: Poor cardiorespiratory fitness does not predict increased hospital LOS or MAEs in patients undergoing iRARC. Overall, MAE and LOS comparable with other series. © 2016 Elsevier Inc. All rights reserved.

Keywords: Anaerobic threshold; Cardiopulmonary exercise testing; Cardiorespiratory; Complications; Length of stay; Muscle invasive; Radical cystectomy; Robotic; Urothelial carcinoma

1. Introduction

The incidence of bladder cancer increases with age and is associated with smoking and exposure to industrial carcinogens. Consequently, premorbid conditions that lead to reduced performance status, such as cardiovascular disease, are apparent in the treated population [1]. Radical cystectomy with urinary diversion remains the gold standard treatment for muscle invasive bladder cancer and nonmuscle invasive disease in selected patients. Following radical cystectomy, the major adverse event rate is around 15% and the 90-day mortality is between 1.7% and 9%, both of which reflect the effect of surgery in a patient group with reduced performance status [2–4].

A number of methods exist to measure performance status with the intention to predict postoperative adverse events and their use is recommended before major surgery [5–8]. Tools such as the American Society of Anaesthesiologists (ASA) index, Charlson comorbidity index, Eastern Cooperative Oncology Group performance index can be used to assign risk for major complication and mortality following radical cystectomy. Another method, cardiopulmonary exercise testing (CPET) has the distinct advantage of measuring the efficiency of physiological oxygen exchange, and therefore cardiorespiratory function (CRF) for the individual being tested. This allows clinicians to create a personalized risk profile with which to predict postoperative morbidity and mortality [9,10]. Systemic complications that occur following major surgery arise in part because of the inability of patients with poor CRF to meet the increased perioperative oxygen demand which arises because of a systemic inflammatory response [11,12]. Measuring the peak oxygen uptake (peak VO_2) during exercise, the threshold at which anaerobic respiration begins to supplement aerobic respiration, the anaerobic threshold (AT), and the peak VO_2 and ventilatory equivalent for carbon dioxide (VE/VCO_2) which gives a measure of pulmonary efficiency can predict postoperative morbidity and mortality [10,13–15]. Patients with a poor CPET result are at much higher risk of perioperative cardiac morbidity and death [9,10,13–15]. Variables derived from CPET including AT and VEO_2 are predictive of major complications and length of stay (LOS) following open cystectomy (ORC) and also robotic assisted radical cystectomy (RARC) with extracorporeal diversion (extracorporeal RARC [eRARC]) [14,15].

We sought to determine the association between cardiorespiratory fitness, as measured by CPET, and major complications or hospital LOS in patients undergoing Intracorporeal RARC (iRARC). Our hypothesis was that the described CPET measures (AT and VEO_2), which are predictive of outcome for ORC and eRARC should also predict outcome in patients undergoing iRARC [14,15].

2. Patients and methods

2.1. Patients

Over a 45-month period, 128 patients underwent radical cystectomy at a single pelvic uro-oncology center. Overall, 17 patients underwent planned ORC: 7 patients had previous pelvic or perineal surgery, 2 had radiotherapy for prostate cancer, 2 patients had clinical T4 stage, 4 patients had a concurrent procedure, and 2 patients were randomized to open surgery as part of a randomized controlled trial comparing open cystectomy to minimal invasive cystectomy (BOLERO) (NCT01196403). The iRARC was performed in the remaining 111 cases (Fig.). CPET was performed on iRARC patients before cystectomy (median: 34 days). Technical aspects of iRARC have been previously described [16,17].

2.2. Ethics

All patients gave written informed consent for the results of their CPET to be stored on an institutional database. Local Research Ethics Committee approval was given for the collection of CPET data on an institutional database (reference: 12/LO/0192).

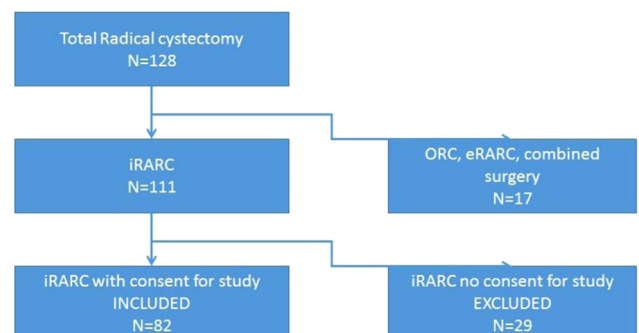


Fig. Flow diagram illustrating case selection.

Download English Version:

<https://daneshyari.com/en/article/6193911>

Download Persian Version:

<https://daneshyari.com/article/6193911>

[Daneshyari.com](https://daneshyari.com)