



Review

Laparoscopic versus open surgery for colorectal cancer in the older person: A systematic review

S.J. Moug^a, K. McCarthy^b, J. Coode-Bate^c, M.J. Stechman^d, J. Hewitt^{e,*}^a General Surgery, Royal Alexandra Hospital, Paisley, Glasgow, United Kingdom^b General Surgery, Southmead Hospital, Bristol, United Kingdom^c Urology, Norfolk and Norwich Hospital, Norwich, United Kingdom^d General Surgery, University Hospital of Wales, Cardiff, United Kingdom^e Department of Academic Geriatric Medicine, Cardiff University, United Kingdom

HIGHLIGHTS

- Seven well conducted randomised controlled trials of open versus laparoscopic colorectal cancer surgery have included older people.
- Age alone should not be a barrier to laparoscopic colorectal cancer surgery.
- The effect of comorbidity in older people undergoing laparoscopic surgery is less clear and warrants further study.

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ABSTRACT

Background: Laparoscopic surgery is being increasingly offered to the older person.**Objective:** To systematically review the literature regarding laparoscopic colorectal cancer surgery in older people and compare to younger adult populations.**Study selection:** We included randomized controlled trials that compared open to laparoscopic colorectal cancer surgery. Older people were defined as being 65 years and above.**Outcome measures:** Overall survival and post-operative morbidity and mortality. Secondary endpoints were length of hospital stay, wound recurrence, disease-free survival and conversion rate.**Results:** Seven trials included older people, average age of approximately 70 years. Two reported data specific to older patients (over 70 years): The ALCCaS study reported reduced length of stay and short-term complication rates in the laparoscopic group when compared to open surgery (8 versus 10 days, and 36.7% versus 50.6% respectively) and the CLASICC study reported equivalent 5 year survival between arms and a reduction of 2 days length of stay following laparoscopic surgery in older people. In trials which considered data on older and younger participants all five trials reported comparable overall survival and showed comparable or reduced complication rates; two demonstrated significantly shorter length of stay following laparoscopic surgery compared to open surgery.**Conclusion:** Large numbers of older people have been included in well-conducted, multi-centre, randomized controlled trials for laparoscopic and open colorectal cancer surgery. This systematic review suggests that age itself should not be a factor when considering the best surgical option for older patients.© 2015 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Limited. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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* Corresponding author. 3rd Floor Academic Building, University Hospital Llandough, Cardiff, CF64 2XX, United Kingdom.

E-mail address: hewittj2@cardiff.ac.uk (J. Hewitt).

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1. Introduction

1.1. Background

As the population ages, a greater number of older people are presenting with colorectal cancer requiring surgical resection. Over the past 20 years laparoscopic surgery for colorectal cancer has become an increasingly common surgical option. This evidence base has been developed via a series of increasingly large and well-conducted studies, reinforced by numerous meta-analyses [1–3]. The majority of these studies were conducted in much younger populations [4]. Whether older people undergoing surgery present the same challenges as younger people is not known. Factors such as impaired wound healing, restrictions on mobility, frailty, sarcopenia, multi-morbidity and poly-pharmacy may influence the outcome of surgery. Whether laparoscopic surgery in the older person confers the same safety profile and benefit as the younger person has not been widely explored.

Our objectives were to determine the outcomes of laparoscopic surgery in comparison to open surgery and to systematically review the evidence base on which laparoscopic surgery is being offered to older people.

2. Methods

2.1. Systematic literature search

In December 2014, we systematically searched the literature and electronic databases (MEDLINE, Embase and Cochrane Library) using the following search terms as key words; colon, colorectal, rectum, sigmoid, laparoscopic, open, older person, elderly, neoplasm, cancer, tumour and malignant. We did not apply any language restrictions. We hand searched the reference lists of all selected trials and contacted trial authors. The full search strategy is given in [appendix 1](#).

2.2. Study design and participants

All randomized controlled trials (RCT) that compared open versus laparoscopic surgery for colorectal cancer were included. Our focus was on people aged 65 years and above and we excluded any trial that specified an upper age limit. We excluded any trial that included less than 100 participants in either randomized arm and trials published before 2000. The study was registered at the research registry, UIN 305.

2.3. Primary endpoints

Overall survival, post-operative mortality and morbidity.

2.4. Secondary endpoints

Length of hospital stay, port (or wound) site recurrence and conversion from laparoscopic to open surgery rate.

2.5. Data extraction

Two authors performed the literature search (SM and JCB) and three authors independently reviewed the articles for suitability and extracted the preselected endpoints (JH, MS and KM). Two authors (SM and JH) independently reviewed the studies to assign a Jadad [5] score to help assess the quality of the selected studies. Disputes were settled by mutual consent between all authors.

3. Results

We identified 1374 studies, 210 duplicates were removed. The remaining reviewed and the abstracts assessed. Following this 47 full papers were obtained. Of these 26 were excluded (no focus on colorectal cancer, contained less than 100 per randomisation arm, were published before 2000 or included an upper age limit). This left a total of 21 papers, derived from 7 study groups. The details are shown in the PRISMA diagram, [Fig. 1](#) [6]. The included trials and baseline characteristics are listed in [Table 1](#).

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