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Editorial

The Role of Pre-Assessment in Oesophageal Cancer Surgery

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National figures for oesophagectomy mortality in the United Kingdom have been steadily dropping (12% to 9%) since the late 1990's.[1] More recently, these figures have improved significantly as shown in the 2016 annual report of the UK National Oesophago-Gastric Cancer Audit (NOGCA), revealing a post-oesophagectomy 90-day mortality rate of 3.2%.[2] Despite this, surgical treatment for oesophageal cancer still carries significant morbidity, often quoted up to 64%.[3] While centres of excellence maintain high standards of surgery and improved surgical techniques, with minimally invasive techniques potentially reducing physiological stresses on patients, we are perhaps being less conservative in our selection of patients for surgery; all having varying influences on the overall risks.

Pre-assessment of patients over the last 2 decades has dramatically changed. We have moved from pre-assessment being performed by the most junior members of the surgical team in the past, to the current system with dedicated consultants and nurse specialists, specializing in peri-operative medicine. This has been shown to decrease cancellations of surgery, reduce length of stay in a number of surgical specialities and potentially improve the outcome.[4,5]

The primary aim is to balance the impact of the stress of surgery and the overall physiological reserve of the patient, to provide some idea of the individual's risk of morbidity and mortality. Based on this initial assessment, any specific risks would be highlighted and strategies to mitigate these would be implemented, thus, attempting to tip the balance to lower those risks.

RISK ASSESSMENT

Currently, a number of scoring systems are used to evaluate the co-morbidities and physiological reserve in patients. All have limitations and relatively poor specificity but by combining scores, evaluation could be improved. The most commonly used scoring system worldwide is the American Society of Anaesthesiologists (ASA) Physical Status. Its limitations include lack of specificity and a large inter-assessor variability.[6] Others are Lee's Revised Cardiac Index and POSSUM score.[7] Another well-known system is the Charlson Comorbidity Index, which determines increased risk based on the number and severity of each of the co-morbidities the patient has. This has been validated both in gastric and oesophageal cancer as a predictor of mortality.[8] Repeatedly, age has not been shown to be a predictor of morbidity and mortality; rather, the co-morbidities and the overall fitness of the patient need to be weighed to determine the overall risk.[9]

Frailty is therefore becoming one of the strongest predictors of outcome in oesophagectomy patients. Associated with frailty is sarcopenia, which is recognised as a global quantitative marker of frailty, and could potentially be used to assist with assessment. Here sarcopenia, which is age-related muscle mass and strength loss, should be differentiated from cachexia, which may be due to malignancy or its treatment with chemotherapy.[10]

Cardiopulmonary exercise testing (CPET) is increasingly being used to risk stratify patients undergoing complex gastrointestinal surgery. Anaerobic threshold (AT) has been extensively associated with cardiovascular risk stratification in many surgical subspecialties. In oesophageal cancer resections, an AT of less than 11 ml/kg/min has been shown to be an indicator of increased cardiopulmonary complications as well as predicting a higher rate of unplanned intensive care unit admissions.[11] More recently another marker that is considered to perhaps be an even more accurate predictor of cardiopulmonary complications is the

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maximum oxygen uptake (VO_2 max). In a Japanese study of 91 patients who had undergone radical oesophagectomy for cancer with 3-field lymph node dissection, VO_2 max was found to correlate with cardiopulmonary complication rate, with a minimum cut-off at 800 ml.min^{-1}.m^{-2}.[12] Patients with VO_2 max above that had a low cardiopulmonary complication rate and it was recommended that radical oesophagectomy was safe within that patient cohort. On the contrary, with a VO_2 max between 700 to 799 ml.min^{-1}.m^{-2}, a cardiopulmonary complication rate of 44% was shown, whereas when the VO_2 max was dropping below 699 ml.min^{-1}.m^{-2}, cardiopulmonary complication rate was in the area of 86%. Certainly, further work in this area is sorely needed to exploit this useful mode of assessment.

PRE-HABILITATION

CPET has been used successfully in orthopaedics and more recently in colorectal cancer to improve post-operative recovery.[13,14] Ongoing clinical trials are underway looking at the effect of pre-habilitation in patients undergoing treatment for oesophageal cancer.[15] The approach is of a trimodal one to improve a patients overall well-being through exercise, nutrition (protein supplementation), and psychological support (anxiety reduction). This is believed to have a greater impact on patients through improved compliance and marginal gains.[13,16,17]

OPTIMISATION

As the patient's journey prior to surgery often involves investigations and possible treatment with neo-adjuvant chemotherapy, there is an opportunity to improve the co-morbidities to further reduce peri-operative risks weeks before surgery. Smoking cessation, anaemia control, hypertension and diabetic management are but a few conditions that these patients often have as well. Optimising these prior to surgery could reduce their overall peri-operative risks.

FUTURE

Pre-assessment for oesophageal cancer is continuing to improve with models of care learnt from other areas of medicine and surgical sub-specialties. Enhanced recovery principles along with tailoring patient's pre-operative care through pre-habilitation could greatly improve oesophageal surgical outcome with development of adequate evidence-based support.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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