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Session 1: Should we be setting the standards for colorectal cancer care globally?

Commentary: Colon cancer surgery: pathological quality control is essential for optimal outcomes.

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Abstract

Following Professor Madoff's overview lecture and the experts' round table discussion Dr West and Prof Quirke provide a commentary of the major gains which could be made by improving and standardising the quality of colon cancer surgery.

As described by Professor Madoff in “Colon cancer – ten years behind the rectum”, efforts to improve and standardise the quality of rectal cancer surgery over the past thirty years have led to significant improvements in outcomes to a point where rectal cancer survival is now superior to that of colon cancer. Much of the progress in rectal cancer followed observations by pathologists that avoiding circumferential resection margin (CRM) involvement reduced the rate of local recurrence[1], and that this is best achieved by dissecting in the mesorectal fascial plane[2], and sometimes extending into the extralevator plane with abdominoperineal excision. Such pathological quality control is now routinely practiced around the world with CRM status and mesorectal quality reported and discussed in multidisciplinary meetings along with specimen photographs, which provide a permanent record of surgical quality.

Over the past ten years, we have demonstrated that similar differences in specimen quality can be observed following colon cancer surgery. A retrospective observational study in Leeds showed that specimens resected in the intact ‘mesocolic’ plane were associated with 15% better five year overall survival when compared to specimens with defects down to the muscularis propria[3]. This difference rose to 27% in cases with stage III disease. These observations were independently validated by the MRC CLASICC trial[4], where furthermore muscularis propria plane surgery was associated with significantly increased local recurrence compared to more intact surgery. Local pathologists in the international FOxTROT trial have for the first time prospectively graded the quality of colon cancer specimens using this three point mesocolic scoring system[5]. The trial has recently completed and the results and relationship to outcomes are eagerly awaited.

Complete mesocolic excision with central vascular ligation (CME) consists of surgery in the mesocolic plane with transection of the blood vessels at their origin. It is associated with a significantly higher mesocolic plane rate, a greater lymph node yield and excellent outcomes[6]. Using morphometry, we have shown that this technique is associated with the resection of more mesentery (centrally and longitudinally) when compared to conventional colon cancer surgery[6]. The technique can be effectively performed laparoscopically in expert centres[7], and importantly can be easily adopted by motivated teams following multidisciplinary training[8].

Japanese D3 surgery is based on similar principles to CME with equally excellent outcomes. The mesocolic plane rate is high and associated with the removal of significantly more central mesentery than conventional surgery[9]. Interestingly the Japanese remove less colon than CME surgeons but with similar outcomes suggesting that removal of the entire local drainage field is more important than the total number of nodes removed. This entirely follows the principles of central lymphatic spread and underpins the importance of CME, as first described by Jamieson and Dobson in 1908[10]. CME and D3 surgery are currently being compared in the Japanese T-REX trial.

The relative importance of the mesocolic plane and a high vascular ligation are as yet unknown. CME has a higher rate of both when compared to conventional surgery therefore it is very difficult to identify the additional benefit of central ligation. This is especially important given the description of increased morbidity with CME by some

centres. None of the studies that have compared high to low level ligation to date have standardised the plane of surgery first. Any benefit of high ligation is likely to be lost if significant defects are present in the mesentery. There is good evidence that the plane of surgery is very important and it is likely that a high tie provides some additional benefit, although which patients benefit and by how much remains elusive. It is unlikely to be of benefit in all cases therefore a stratified approach may be possible based on disease extent and fitness. Ultimately a randomised trial of high versus intermediate level ligation with standardised mesocolic plane surgery backed up by rigorous pathological quality control may provide these urgently needed answers.

There are major gains to be made by improving and standardising the quality of colon cancer surgery. Doubts about the value of a central ligation should not stall this process, which should be driven by pathologists providing meticulous quality control. It would be irresponsible of us all to allow another decade to pass without further in depth investigations into the importance of high quality of colon cancer surgery, more so because of the very large gains made in rectal cancer surgery.

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