Current practice in abdominoperineal resection: an email survey of the membership of the Association of Coloproctology

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ABSTRACT

INTRODUCTION This study aimed to gain insight into current preferences for type of surgical approach and patient positioning in abdominoperineal excision of the rectum (APER), to identify whether these factors affect self-reported oncological outcomes and complication rates, and to assess the opinions of members of the Association of Coloproctology of Great Britain and Ireland (ACPGBI) with regards to the benefit of a national training programme for APER surgery.

METHODS Members of the ACPGBI were surveyed using a questionnaire designed to examine surgeon/departmental demographics, type of APER practised, audit of results and complications, opinions regarding extralevator APER (ELAPER) and opinions regarding the potential benefit of a national training programme.

RESULTS According to the survey, 62% of surgeons perform perineal dissection in the supine position and 57% perform a standard APER technique. Surgeons who only practise colorectal surgery ($p=0.002$) and surgeons performing prone dissection ($p<0.0001$) are more likely to perform ELAPER. Three-quarters (76%) audit their results for perineal wound complication rates. Over 80% audit their oncological outcomes. The vast majority (94.6%) of those who perform ELAPER believe there is a benefit to this method while 59.6% of those who do not perform ELAPER still believe there is a benefit to ELAPER. Only 50% feel that there should be a national training programme.

CONCLUSIONS There is a distinct discordance with regards to the APER technique. Among UK colorectal surgeons, although a significant proportion favours ELAPER, there remains a larger proportion still performing standard APER techniques.

KEYWORDS

Colon cancer – Colorectal surgery – Clinical audit – Survey

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Abdominoperineal excision of the rectum (APER) is becoming less commonly carried out^{1,2} as the boundaries for 'ultra low' anterior resections (AR) are pushed ever further. Furthermore, there is recognition that APER carries a worse prognosis than anterior resection for rectal tumours.^{3,4}

The poorer oncological results following APER when compared with anterior resection have encouraged a call for a change in approach and sparked interest in optimising the surgical techniques employed. Holm *et al* described the 'extended APER',⁵ which closely mirrors the original operation described by Miles in 1908.⁶ This technique (cylindrical or extralevator APER [ELAPER]) is described as resection of the levator muscle *en bloc* with the anal canal and lower rectum, without dissecting the mesorectum from the levator muscles. Holm *et al* also recommended performing the perineal portion of the operation in the prone jack-knife position.⁵

A culture shift in cancer surgery and surgical training means that the majority of colorectal cancers are now operated on by specialist colorectal surgeons. However, even among this group there is no universally agreed 'best practice' for APER. Surgeons often have strong preferences as to patient position and type of surgery, and this may well be linked to individual oncological results and complication rates. A development programme for the management of low rectal cancer was established in 2010⁷ and this may lead to some agreement regarding the best methods for performing APER and perineal reconstruction.

The aim of this work was to gain an insight into current preferences for type of surgical approach and patient positioning in APER. A further aim was to assess the opinions of members of the Association of Coloproctology of Great Britain and Ireland (ACPGBI) with regards to the benefit of a national training programme for APER surgery.

Methods

A questionnaire was designed to include questions related to: surgeon and departmental demographics; type of APER practised; audit of results and complications; opinions regarding ELAPER; and opinions regarding the potential benefit of a national training programme for APER. The questionnaire can be obtained from the authors if required. ACPGBI members were identified as those listed in the 2010 member directory and the questionnaire was sent electronically to the listed email address. Questionnaires were re-sent after three weeks to maximise the response rate. The data were collated with Excel® 2007 (Microsoft, Redmond, WA, US) and analysed using SPSS® v15.0 (SPSS, Chicago, IL, US).

Results

A total of 779 members in the 2010 ACPGBI membership directory had email addresses listed. There were 747 appropriate recipients (excluding those members whose email addresses were listed incorrectly or who replied to say they had retired or were not surgeons). Responses were received from 260 members (34.8%), of whom 206 (79.2%) completed the survey in its entirety.

Demographics

A median of four colorectal surgeons work in each unit (range: 1–22). In the majority of units (85.5%), all colorectal surgeons perform APER.

Our survey population sampled surgeons with an average of 11.9 years of consultant experience (range: 1–39 years). Approximately a third (77/214, 36.0%) of these surgeons described themselves as colorectal surgeons while two-thirds (137/214, 64.0%) described themselves as general surgeons with a specialist interest in colorectal surgery.

The vast majority (94.0%) of surgeons personally perform APER operations. Surgeons typically perform 3–5 APERs per year (Fig 1).

Figure 1 Number of abdominoperineal resections performed by respondents in the preceding year

Patient positioning

Approximately two-thirds (146/236, 61.9%) of respondents performing APER carry out the perineal component with the patient in the supine (Lloyd-Davies/lithotomy) position. Those surgeons performing the perineal portion of APERs in the prone position are significantly more likely to be performing ELAPER than standard APER (79.5% vs 20.4%; Fisher's exact test, $p < 0.0001$).

Perineal defect repair

Common methods of closing the perineal defect included primary repair (52.6%), primary repair with omentoplasty (21.4%), biological collagen mesh (eg Permacol®; Covidien, Norwalk, CT, US) (13.2%) and myocutaneous flaps (12.8%). Other methods (including use of synthetic mesh or a varied approach depending on circumstances) totalled less than 1% of responses.

Surgeons performing standard APER were more likely to close the defect by primary repair than any other method (ANOVA, $p = 0.002$). Surgeons performing ELAPER were more likely to use methods other than primary repair to fill the defect (67% vs 33%) but this did not reach statistical significance.

Of the 30 respondents who use tissue flaps regularly to fill the perineal defect, 21 (70.0%) use vertical rectus abdominis myocutaneous flaps, with the remainder using various techniques (inferior gluteal artery perforator, gluteal, gracilis and fasciocutaneous V-Y based on perforators).

Type of APER procedure

Over half of the respondents performing APER (132/231, 57.1%) stated they perform a standard APER technique while 102 (44.2%) perform ELAPER. Thirteen respondents (5.6%) stated that their choice of technique depends on tumour stage/location or that they use a modified approach (eg excision of a cylindrical specimen without removing the coccyx or a partial levator excision).

Surgeons who only practise colorectal surgery are more likely to perform ELAPER compared with those also practising general surgery (chi-squared test, $p = 0.002$) but consultant seniority was not significantly associated with choice of APER technique ($p = 0.09$). Surgeons who performed ELAPER tended to work in larger units (ANOVA, $p = 0.02$).

Audit of post-operative complications

Only three-quarters of respondents (173/228, 75.9%) answered that they audit their perineal wound complication rates. The most common response given by surgeons for their rates of wound infection, wound breakdown and persistent sinus formation was 0–10% (47.0%, 51.9% and 85.9% of respondents respectively).

Oncological outcomes

Audit of involved margin rates, tumour perforation rates and local recurrence rates was undertaken by 92.3%, 81.9% and 85.0% of respondents respectively. The majority of surgeons answered that their involved margin, tumour perforation and local recurrence rates were 0–5% (71.6%, 86.3% and 70.8% of respondents respectively).

Training for extralevator APER

Seventy-six per cent of respondents believe that there is benefit to ELAPER. Of those respondents who do not believe there is benefit, comments included that some respondents practise a modified approach or that there are clear benefits in some cases but not routinely. Of the surgeons who perform ELAPER, the vast majority (94.6%) felt that there is benefit to this method. Interestingly, of surgeons performing standard APER, a small majority (59.6%) still felt that there was a benefit to the extralevator approach (chi-squared test, $p < 0.001$).

Fifty per cent of respondents felt that there should be a national training programme for ELAPER.

Discussion

Historically, the perineal portion of an APER has been performed in the supine lithotomy position. Anecdotally, however, the use of prone positioning seems to have become more common in recent years, with some suggesting that this allows the rectum to be 'prolapsed out' after opening the pelvis, thereby giving excellent visualisation of the planes anteriorly⁸ and reducing intra-operative perforations.⁹ It is clear from our survey that the vast majority of surgeons performing the extralevator APER technique are employing prone positioning for the perineal portion of the operation, as described by Holm *et al.*⁵ Nevertheless, in contrast to classical teaching, there are a number of surgeons who use the prone position for a standard APER. Despite this, our results suggest that the majority of UK colorectal surgeons are continuing to perform this part of the operation in the supine position.

It is well established that APER yields higher circumferential resection margin (CRM) positivity, local recurrence, intra-operative perforation and lower survival compared with anterior resection.^{2-4,10} With standard APER, CRM positivity ranging from 25% to 40% is not uncommon.¹¹ West *et al* demonstrated with tissue morphometry that the extralevator technique removed significantly more tissue in the distal rectum and in all slices that contained tumour compared with the standard operation.^{8,9} A significantly greater distance was observed from the muscularis propria or internal sphincter to the anterior, posterior, and lateral resection margins ($p < 0.0001$).⁹ This was associated with lower CRM involvement (20.3% vs 49.6%; $p < 0.001$) and intra-operative perforations (8.2% vs 28.2%; $p < 0.001$).⁸ Bebenek showed similarly successful oncological outcomes (tumour perforation 4.3%, CRM positivity 7.6%, local recurrence 4.4% at 2 years, 5-year survival 68.3%) using an abdominosacral excision technique in the prone position for 210 low rectal cancers.¹²

With this evidence in mind, the question arises as to why a larger proportion of UK colorectal surgeons have not yet adopted ELAPER. The answer to this may lie in the fact that a number of surgeons have commented that the 'standard' APER they perform is very similar in scope to the extralevator approach described by Holm *et al*⁵ and they may therefore already perform a more radical 'standard' operation, thereby minimising the risks of perforation and margin involvement.

The poor results for standard APER alluded to above contrast sharply with the rates of margin positivity, tumour perforation and local recurrence reported by participants in this survey, which are as low or lower than anything in the literature. The explanation for this is not clear. It may reflect the fact that some surgeons have already moved to an extralevator approach or that others already perform a more radical 'standard' approach. Whether these low rates are reflected in the National Bowel Cancer Audit database and future outcome data remains to be seen.

Although the majority of our respondents reported a belief that the extralevator technique carries a benefit (including a small majority of those not currently practising this technique), this was not reflected in a sentiment towards the establishment of a national training programme.

The national training scheme for laparoscopic colorectal surgery is now well established with over a third of the colorectal consultants in England involved as either trainee or trainer across 11 national training centres.¹⁷ Borne of a shortage in consultants trained in laparoscopic resection, this programme has been very well received and is supported by the government. Our results suggest that relatively few colorectal surgeons nationally perform the extralevator technique and one of the reasons may be a lack of structured training. The Low Rectal Cancer National Development Programme aims to improve cancer outcomes and the quality of life for patients with low rectal cancers.⁷ This includes discussion about patient selection for ELAPER and structured high quality training in the operative technique. It would be instrumental in the planning and delivery of a training programme for APER.

The authors recognise the seemingly low response rate (approximately 35%) in this survey. Web-based surveys do confer several advantages, not least of all cost as well as speed and accuracy of data collection.¹⁸⁻²⁰ Unfortunately, the most commonly cited disadvantage is a low response rate¹⁸ and therefore a perceived non-response bias.^{18,19,21} In fact, surveys (of any type) directed at physicians are often characterised by low response rates, with the offer of financial incentives shown to be the most successful method of maximising responses.²⁰ There has been work to show that despite lower response rates received through a web-based survey design, neither the demographic make-up of respondents nor the final result is necessarily affected significantly.¹⁹ Indeed, patterns of association may even be more robust.²⁰ The effect of response rate on the results in our survey is not definable but the response rate itself is within typical email survey limits.²²

Conclusions

There is a distinct discordance among colorectal surgeons with regards to techniques for performing abdominoperineal excision and preferences for patient positioning intra-operatively. The literature would support extralevator/cylindrical resection as providing better oncological results and therefore lower local recurrence but with significant increases in wound complications. We have shown that among UK colorectal surgeons, although a significant pro-

portion favour the extralevator type of resection, there remains a larger proportion still performing standard abdominoperineal excision techniques.

References

1. Tilney HS, Heriot AG, Purkayastha S *et al*. A national perspective on the decline of abdominoperineal resection for rectal cancer. *Ann Surg* 2008; **247**: 77–84.
2. Morris E, Quirke P, Thomas JD *et al*. Unacceptable variation in abdominoperineal excision rates for rectal cancer: time to intervene? *Gut* 2008; **57**: 1,690–1,697.
3. Marr R, Birbeck K, Garvican J *et al*. The modern abdominoperineal excision: the next challenge after total mesorectal excision. *Ann Surg* 2005; **242**: 74–82.
4. Nagtegaal ID, van de Velde CJ, Marijnen CA *et al*. Low rectal cancer: a call for change of approach in abdominoperineal resection. *J Clin Oncol* 2005; **23**: 9,257–9,264.
5. Holm T, Ljung A, Häggmark T *et al*. The extended abdominoperineal resection with gluteus maximus flap reconstruction of the pelvic floor for rectal cancer. *Br J Surg* 2007; **94**: 232–238.
6. Miles WE. A method of performing abdomino-perineal excision for carcinoma of the rectum and of the terminal portion of the pelvic colon. *Lancet* 1908; **2**: 1,812–1,813.
7. Low Rectal Cancer National Development Programme. <http://www.lorec.nhs.uk/> (cited February 2012).
8. West NP, Anderin C, Smith KJ *et al*. Multicentre experience with extralevator abdominoperineal excision for low rectal cancer. *Br J Surg* 2010; **97**: 588–599.
9. West NP, Finan PJ, Anderin C *et al*. Evidence of the oncologic superiority of cylindrical abdominoperineal excision for low rectal cancer. *J Clin Oncol* 2008; **26**: 3,517–3,522.
10. Wibe A, Syse A, Andersen E *et al*. Oncological outcomes after total mesorectal excision for cure for cancer of the lower rectum: anterior vs abdominoperineal resection. *Dis Colon Rectum* 2004; **47**: 48–58.
11. den Dulk M, Marijnen CA, Putter H *et al*. Risk factors for adverse outcome in patients with rectal cancer treated with an abdominoperineal resection in the total mesorectal excision trial. *Ann Surg* 2007; **246**: 83–90.
12. Bebenek M. Abdominosacral amputation of the rectum for low rectal cancers: ten years of experience. *Ann Surg Oncol* 2009; **16**: 2,211–2,217.
13. Chavarriaga LF, Lin E, Losken A *et al*. Management of complex abdominal wall defects using acellular porcine dermal collagen. *Am Surg* 2010; **76**: 96–100.
14. Han JG, Wang ZJ, Gao ZG *et al*. Pelvic floor reconstruction using human acellular dermal matrix after cylindrical abdominoperineal resection. *Dis Colon Rectum* 2010; **53**: 219–223.
15. Harth KC, Rosen MJ. Major complications associated with xenograft biologic mesh implantation in abdominal wall reconstruction. *Surg Innov* 2009; **16**: 324–329.
16. Loganathan A, Ainslie WG, Wedgwood KR. Initial evaluation of Permacol bioprosthesis for the repair of complex incisional and parastomal hernias. *Surgeon* 2010; **8**: 202–205.
17. National Training Programme for Laparoscopic Colorectal Surgery. <http://www.lapco.nhs.uk/> (cited February 2012).
18. VanGeest JB, Johnson TP, Welch VL. Methodologies for improving response rates in surveys of physicians: a systematic review. *Eval Health Prof* 2007; **30**: 303–321.
19. Fleming CM, Bowden M. Web-based surveys as an alternative to traditional mail methods. *J Environ Manage* 2009; **90**: 284–292.
20. Heiervang E, Goodman R. Advantages and limitations of web-based surveys: evidence from a child mental health survey. *Soc Psychiatry Psychiatr Epidemiol* 2011; **46**: 69–76.
21. van Gelder MM, Bretveld RW, Roeleveld N. Web-based questionnaires: the future in epidemiology? *Am J Epidemiol* 2010; **172**: 1,292–1,298.
22. Cook C, Heath F, Thompson RL. A meta-analysis of response rates in web- or internet-based surveys. *Educ Psychol Meas* 2000; **60**: 821–836.