Controversies in Abdominoperineal Excision

Torbjörn Holm, MD, PhD

KEYWORDS

• Rectal cancer • Abdominoperineal excision • Circumferential resection margin
• Intraoperative bowel perforation • Local recurrence • Cancer survival
• Perineal reconstruction

KEY POINTS

- Oncological outcomes after abdominoperineal excision (APE) in rectal cancer have not improved to the same extent as those seen after AR.
- The conventional synchronous combined APE is not a standardized procedure.
- Depending on tumor stage and patient characteristics and based on well-defined anatomic structures, three types of APE can be described, which differ in the extent of removed tissue.
- A more precise surgical approach may reduce tumor-involved resection margins and intraoperative bowel perforations, which likely will improve local control and survival for patients with low rectal cancer.

INTRODUCTION

The earliest surgical attempts to treat rectal cancer were via the perineum and the techniques used were exclusively extraperitoneal with extremely poor results. The perioperative mortality was high, functional results appalling, and local control very bad, with local recurrence rates up to 90%. Sir Ernest Miles, a surgeon at St Mark's Hospital in London, took an important step in the development of surgery for rectal cancer when he published an article, "A Method of Performing Abdomino-Perineal Excision for Carcinoma of the Rectum and of the Terminal Portion of the Pelvic Colon," on December 19, 1908, in *The Lancet*.[1] This was a thorough description of an APE of the rectum and has since been called the *Miles operation*. In his original description of the procedure, the rectum was bluntly mobilized down to the sacrococcygeal articulation, to the prostate, and to "the upper surface of the levatores ani" laterally, thus leaving the mesorectum attached to the pelvic floor. After this mobilization of the

No disclosures.
Section of Coloproctology, Department of Surgical Gastroenterology, Karolinska University Hospital, Stockholm 171 76, Sweden
E-mail address: torbjorn.holm@karolinska.se

Surg Oncol Clin N Am 23 (2014) 93–111
http://dx.doi.org/10.1016/j.soc.2013.09.005 **surgonc.theclinics.com**
1055-3207/14/$ – see front matter

rectum, a colostomy was created and the abdominal wall was closed. The patient was turned over and placed in the right lateral and semiprone position. Miles emphasized that the levator muscles should be divided "as far outwards as their origin from the white line so as to include the lateral zone of spread"; therefore, the perineal part of the operation included a wide excision of skin, fat, and pelvic floor (levator muscles).

The Lancet article had an enormous impact on the surgical community and for many decades the Miles operation was the gold standard procedure for all rectal carcinomas. The concept of removing the entire rectum, the anus, and the perineum in all patients with rectal cancer, however, was gradually abandoned. Increasing experience with bowel reconstruction, including developments of stapling instruments, led to a new concept of anterior resection (AR) and low AR (LAR), which became the standard procedures for tumors of the upper and middle rectum.[2–6]

For tumors of the lower rectum, most surgeons continued to perform APE, although the extensive perineal approach described by Miles was more or less neglected and the synchronous combined APE was introduced as a feasible procedure that became popular and gained widespread use in the treatment of low rectal cancer.[7] During the synchronous combined operation, the perineal part is carried out simultaneously with the pelvic part of the abdominal procedure, with the patient in the supine lithotomy, or Lloyd-Davies position; the rectum with its mesorectum is first mobilized down to the pelvic floor and the perineal surgeon then enters the pelvic cavity just in front of the coccyx, the levator muscles are divided on both sides, and, finally, the rectum is dissected off the prostate or the vagina and the specimen is delivered through the perineum.

Although there were gradual improvements in the treatment of rectal cancer during the twentieth century, local control remained a major problem after surgery, with local recurrence rates of up to 40% after potentially curative resections.[8] Therefore, irradiation to the rectum and to the pelvis, both preoperatively and postoperatively, was tried in order to improve local control. Preoperative radiotherapy has been evaluated in several large randomized trials and was shown to reduce local recurrence rates by 50% and to improve cancer-specific survival.[9,10]

With the development of total mesorectal excision (TME), as described by Heald and colleagues,[11,12] treatment results improved dramatically, both concerning local control and survival. Heald and colleagues[11] reported a local recurrence rate of approximately 5% and a cancer-specific survival of approximately 70% at 5 years, without radiotherapy.[12] Initially, these results were mistrusted by many surgeons but, due to extensive educational efforts, the technique was gradually accepted.[13] During the recent 15 to 20 years, the TME technique for rectal cancer resection has been introduced in many countries and, subsequently, the results with regard to local control and cancer survival have improved significantly. Local recurrence rates are now reported to be less than 10% in population-based studies.[14,15] The acknowledgment of TME as the standard surgical technique in the treatment of rectal cancer has resulted not only in improved local control and survival but also in increasing rates of sphincter-saving procedures and improved results concerning urogenital function.

Consequently, in the past 15 to 20 years, teaching rectal cancer surgery mainly focused on the operative technique of TME and AR. Although the technique used for the abdominal part of an APE was modified along the lines of TME, little attention was given to the perineal part of this procedure. Thus, most surgeons adopted the technique of sharp dissection under direct vision outside the mesorectal fascia down to the pelvic floor, with the aim of saving autonomic nerves and creating perfect specimen with an intact mesorectal fascia. The perineal part, however, was often completed in the conventional way, with dissection close to the external sphincter