

Anterior Perineal PlanE for Ultralow Anterior Resection of the Rectum (The APPEAR Technique): A Video Demonstration

Khalid A. El-Gendy, BSc, MBBS, MRCS (Eng), Jamie Murphy, BChir, MRCS (Eng), Narinder S. Kullar, MBBS, MSc(MedEd), MRCS, Christopher L. H. Chan, BSc, PhD, FRCS (Eng), and Norman S. Williams, MS, FRCS (Eng)

Centre for Academic Surgery, Institute for Cell and Molecular Science, Barts and the London, Queen Mary's School of Medicine and Dentistry, University of London, London, England, UK

ABSTRACT

Background. Sphincter-saving rectal resections have become commonplace in the surgical treatment of malignant rectal pathology. However, restoration of gastrointestinal continuity by means of conventional techniques proves technically challenging in cases of very low rectal pathology, with resultant variable requirements for a permanent stoma. The APPEAR procedure (Anterior Perineal PlanE for Ultralow Anterior Resection of the rectum) is a novel sphincter-saving resection technique to restore gastrointestinal continuity in those who would otherwise require a permanent stoma with conventional abdominal resections. It ensures that the distal rectum is excised and the anastomosis is constructed under direct vision while simultaneously preserving the anal sphincter and its somatic nerve supply in their entirety.

Indications. This procedure is indicated in the following instances: proven lower-third rectal carcinomas where anatomical restrictions prevent satisfactory rectal dissection and/or transection with a potential inadequate distal clearance margin; ileoanal pouch formation for ulcerative colitis or familial adenomatous polyposis where retained rectal tissue is at risk of future malignancy; short or strictured rectal stumps where pelvic dissection is hazardous and thus prevents restoration of gastrointestinal continuity.

Conclusions. The APPEAR technique is a feasible alternative sphincter-saving procedure to further reduce the requirement of permanent stoma in the treatment for ultralow rectal pathology; however, it is appreciated that a

larger study group with long-term follow-up is required. This technique should facilitate laparoscopic rectal resection because large and distal tumors can be dissected and excised through the perineal wound, ensuring adequate distal clearance and the anastomosis constructed under vision at an appropriate level. Furthermore, the requirement for an abdominal incision is avoided, improving cosmesis.

PROCEDURE

Patients receive full bowel preparation and administration of prophylactic antibiotics on induction. The operation is performed under full general anesthetic with muscle relaxant and the patient placed in the Lloyd-Davies position. A urethral catheter is inserted, and the skin is prepared and draped to allow access to both the perineum and abdomen.

Abdominal Phase

For ultralow rectal cancer, a midline abdominal incision is utilized and the left colon and splenic flexure fully mobilized in the conventional manner with the inferior mesenteric vessels divided and ligated. The abdominal operator then mobilizes the rectum as low in the pelvis as possible with a total mesorectal excision. In ulcerative colitis or familial adenomatous polyposis, a midline abdominal incision is utilized and a total colectomy and standard rectal dissection performed with a stapled ileal J pouch fashioned after adequate small bowel mobilization. The decision to perform the APPEAR procedure is made intraoperatively after trial dissection reveals that conventional sphincter preservation is not feasible or that significant residual rectal tissue will be retained.

Perineal Phase

A crescentic skin incision is made in the perineum midway between the vagina or base of scrotum and the anal verge. Subsequent dissection is facilitated by hydrodissection with the infiltration of 1 in 300,000 adrenaline saline solution into the rectovaginal/prostatic plane. Dissection is continued in a cephalad manner in the plane between the rectum and prostate or posterior vaginal wall by means of diathermy and sharp dissection until the abdominal operator is reached. Care is taken to avoid injury to the sphincter, prostate, vagina, or urethra. (See video.)

The rectum is freed both posteriorly and laterally from the surrounding pelvic floor musculature by means of diathermy. This is continued in a cephalad manner until the posterolateral plane created by the abdominal operator is reached. The abdominal operator transects the rectosigmoid junction by means of a transverse stapling device and passes the transected stapled distal end of the upper rectum through the perineal wound. Subsequently, the residual posterior attachments of the rectum are divided, and thus the rectum enveloped within the pelvic floor musculature is freed completely, if necessary down to the junction of the puborectalis and external anal sphincter. This region is termed the “rectal no-man’s land” and is defined above by the superior border of the levator ani and below by the superior border of the external anal sphincter.¹ Intraoperative measurements of the no-man’s land have demonstrated a variation between 4 and 12 cm.¹ Access to the rectum within the no-man’s land can be limited during both open and laparoscopic abdominal surgery by challenging pelvic anatomy during both dissection and subsequent rectal transection with the current stapling equipment available. This may potentially jeopardize resection margins and necessitate the excision of the anal sphincter mechanism. Furthermore, failure to excise the rectum within the no-man’s land in patients with ulcerative colitis or familial adenomatous polyposis patients may

result in the continuation of symptoms or risk of future malignancy.^{2–4}

Upon complete rectal mobilization, the rectum is transected either with a transverse stapler or by hand just above the anorectal junction, ensuring an adequate distal clearance margin. The proximal mobilized left colon or ileal pouch is delivered through the perineal wound, for cancer or ulcerative colitis/familial adenomatous polyposis patients, respectively. A coloanal or ileal pouch–anal anastomosis is constructed under direct vision by means of the appropriate circular stapling gun inserted through the anal canal. Alternatively, when a transverse stapler cannot be applied across the anorectal stump, the proximal colon or ileal pouch can be drawn through the stump and a transanal anastomosis constructed. A covering loop ileostomy must be constructed in all cases. Assessment of anastomotic integrity is performed at 3–6 months with a water-soluble contrast enema and examination under anaesthetic before consideration of reversal.

ACKNOWLEDGMENT Supported in part by Bowel and Cancer Research Trust. We thank David Futcher of Flowmotion for his technical skills, which were invaluable for the recording and editing of this video.

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