Staplers for obstructed defecation syndrome

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A stapled technique for treatment of rectal mucosal prolapse was initially proposed by Pescatori, who published the first cases in 1997 [1]. Following that, Longo developed the first specific stapler (PPH 33 mm) for hemorrhoidopexy and popularized the technique worldwide. Additionally, using the same stapler, he developed another technique, stapled transanal rectal resection (STARR), to treat obstructed defecation syndrome (ODS) associated with rectocele or intussusception. With the PPH stapler, only a limited amount of tissue can be removed, the cartridge cannot be detached and the shaft inside the cartridge is covered by a tube. This makes it difficult for the surgeon to assess what is incorporated in the stapler, remove a large sleeve of rectum and remove a symmetric amount of tissue. With the development of new and more dedicated staplers like HEM EEA-33 (Covidien), TST STARR PLUS (Touchstone) and Transtar (Ethicon), it is currently possible for the surgeon to achieve all these technical goals. In this issue of *Techniques in Coloproctology*, Naldini et al. [2] describe in great detail the technique and results of circumferential removal of the rectal wall using the TST STARR PLUS stapler in patients with rectocele and internal prolapse associated with ODS.

Besides the choice of the stapler and the surgical technique to be used, the most important factor determining satisfactory functional results is careful patient selection. This is achieved by evaluating all the patients with standardized questionnaires, physical examination and imaging. The dysfunctions of the posterior pelvic compartment are like an iceberg [3]: Rectocele is the first anatomical defect to appear but there are always others not readily seen, such as rectal

intussusception or enterocele, or others such as anismus that can be found only after specific tests are performed. Based on this concept, it is mandatory to carry out a careful proctology examination and to confirm and quantify the physical findings with imaging tests such as cinedefecography, echodefecography (dynamic three-dimensional rectal ultrasound) and dynamic magnetic resonance imaging. It is also important to perform anal manometry to exclude anismus and evaluate sphincter function, and finally perform a urogynecologic evaluation before choosing the most appropriate surgical technique. Surgical treatment with a transanal stapled technique is indicated only if, after this comprehensive evaluation, the presence of rectocele, full mucosal prolapse and/or rectal intussusception is confirmed and anismus, enterocele, anterior or middle compartment prolapse, urge fecal incontinence or weak sphincters are excluded and only after the patient fails conservative treatment with fiber, laxatives and pelvic floor rehabilitation.

Which stapler and which technique? In patients with rectocele, the resection must be close to the dentate line (approximately 1.0 cm proximally) because the herniation starts at the anterior upper anal canal, as suggested by echodefecography [4], and consequently the herniation will persist if the stapled suture is positioned far above that level. Therefore, in female patients with rectocele associated with rectal intussusception, we have proposed the transanal repair of rectocele and rectal mucosectomy with one circular stapler (TRREMS) which may be performed with either the EEA-33 or TST STARR PLUS stapler [5]. These staplers make it possible to quantify the amount of tissue that must be removed and are associated with a low incidence of bleeding after firing which requires hemostatic suture (approximately 7%). In contrast, the PPH stapler has a limited capacity and haemostatic suturing is required in about 20% of patients [6]. In the TREMMS technique, the rectocele is first removed manually using a continuous suture about 2.0 cm from the dentate line. Following that, a purse-string suture is placed to include both the intussusception and the rectocele sutures in order to remove a symmetric wedge of tissue (Fig. 1). This technique has been shown to be safe and effective in

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Fig. 1 TREMMS procedure: a suture is initially placed at the base of the rectocele, the rectocele is removed and the suture is incorporated in the purse-string

prospective studies in women with ODS and grade III rectocele, demonstrating a significant reduction of the Wexner constipation score from 16 to 4 and a 90% anatomical cure on defecography [5]. In order to avoid rectovaginal fistulas, it is recommended to pull up the posterior vaginal wall using two Allis forceps during firing (Fig. 2).

Otherwise, in patients without rectocele and with rectal mucosal prolapse or intussusception, the apex technique [7] (using either the EEA-33 stapler or the TST STARR PLUS) or the technique proposed by Naldini et al. (using the TST STARR PLUS stapler) may be used. In the apex technique, the apex of the prolapse is identified and marked with four stitches, and then a purse-string suture is tied around the center rod of the EEA-33 stapler and passed through the most distal (4 cm) hole. Following this, a second purse-string suture 1.0 cm distal to the first is also tied around the center rod in order to remove more tissue and ensure a symmetric anastomosis (Fig. 3). Using this technique in 45 patients with rectal intussusception, the mean postoperative constipation score decreased from 13 to 5 and follow-up imaging demonstrated complete disappearance of rectal intussusception in all patients. Using the TST stapler, Naldini and colleagues quantified the amount of prolapsing tissue to be removed based on the amount found prolapsing into the circular anal dilator (CAD). In their experience, it was necessary to resect twice the length of the amount of tissue found in the CAD in order to free the CAD from the prolapse. The incorporation of tissue in the stapler was accomplished by placing six traction sutures pulled through the stapler's window at the time of firing as it is shown in their video [2]. In this fashion, they were able to eliminate both rectocele and internal prolapse. Although Naldini et al.

Fig. 2 It is very important to stay as far as possible from the vaginal wall. The authors routinely pull up the posterior vaginal wall with Allis forceps while firing the stapler

Fig. 3 Apex procedure after application of the second purse-string 1 cm distal to the first

did not report on anatomical recurrence, they show a reduction in the mean Wexner score from 17 to 5 and a 6% recurrence of ODS symptoms at 12 months.

The circumferential removal of the prolapsed tissue using the Contour Transtar stapler is also an efficient technique because it is possible to quantify the amount of tissue to remove and the stapled suture can be positioned close to the dentate line, consequently treating both rectal intussusception and the rectocele [8]. However, its main limitation is the high cost (six cartridges are required) and the operative time is longer.

Finally, Naldini and colleagues make a comparison between the amount of tissue removed with the TST STARR PLUS, the PPH03 and the Transtar. The median height of the surgical specimen of 5.6 cm (range 4.5–10 cm) and the surface area removed (average 45 cm²) by the TST STARR PLUS compare favorably with that of two firings of the PPH (average 37 cm²) or the multiple firings of the Transtar (average 54 cm²). The median height of the tissue removed using the EEA 33 is 5.9 cm (range 5–7.5 cm) which is comparable to that removed with the TST STARR PLUS [4].

In conclusion, new dedicated staplers are now available to resect rectocele and internal rectal prolapse transanally. Their common characteristics are the capacity to remove large amounts of tissue, the ability to monitor the amount of tissue incorporated and improved hemostasis. Together with more stringent selection criteria and improved knowledge of multicompartamental prolapse, this represents a progress in the treatment of the anatomical defects associated with ODS.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study formal consent is not required.

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