Laparoscopic approach of anorectal malformations: Have we learnt anything in the past 10 years?

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Since Bischoff, Martínez, and Peña analyzed the role of laparoscopy in the surgical treatment of anorectal malformations (ARMs) in 2015[1], comprehensive studies regarding this approach have been published, with surgeons widely sharing their experience.

In a recent conference held at the IRCAD, I discussed the current state of affairs and the progress achieved in this field of pediatric surgery. I still remember how exciting it was to watch Keith Georgeson present the first laparoscopic case in Sendai in 1999. As attendants, we were all deeply impressed by the accuracy of the technique and the innovative nature of this surgery, which turned out to be a game changer in the approach of these malformations.

In 2015, Peña and Bischoff established the specific indications for the laparoscopic approach –very high, prostatic, or bladder neck fistulas, as well as some exceptional cases of complex cloaca with a loose rectum, absence of or short vagina, low vagina, and high rectum.

The first reviews of the laparoscopic approach revealed a wide array of technical complications, including an increase in the incidence of rectal prolapse from 3% (in the conventional approach) up to 52%, primarily as a result of wide rectal dissection and early colostomy closure[2]. In addition, laparoscopy used to be contraindicated by the presence of persistent residual urethral diverticula caused by an incomplete resection of the fistula in rectobulbar fistulas, since such diverticula predispose to calculi, infections, and malignancy.

So… what's new?

A study on ARMs by a Japanese group[3] comprehensively analyzed all surgical techniques used, and compared the conventional vs. the laparoscopic approach, while enhancing control with cystourethroscopy and the use of clips or an endoscopic guide to divide the fistula. However, no functional follow-up, which is key to assess clinical results, was included.

A 2023 study published in the *Medicine* journal[4] compared 88 patients undergoing rectobulbar fistula surgery –45 posterior sagittal anorectoplasty (PSARP) cases and 43 laparoscopy cases. Functional results were similar, with the dissection method proving particularly significant. It is recommended to dissect the distal rectal portion of the submucosa from 0.5 cm proximal to the urethra –opening the anterior rectal portion–, to detach the mucosa from the fistula until the urethral-rectal mucosal junction has been reached, and to use a PDS 5/0 suture or hem-or-lock according to the length of the muscle cuff.

In this respect, a new study provided a new intraluminal endoscopic approach of the rectum to facilitate the closure of the rectourethral fistula in a safer manner, and to avoid leaving a residual diverticulum[5]. This method was applied to a series of patients with bladder and prostatic rectourethral fistulas, and the results were compared with those from bulbar rectourethral fistulas, with similar clinical and anatomical outcomes.

Technological advances such as indocyanine green (ICG) to mark and locate the rectourethral fistula[6] are also to be mentioned.

Colonic descent in cases where the rectum cannot be descended due to mispositioned colostomies or insufficient rectal segment was also recently assessed[7]. Laparoscopic results are comparable with those of conventional surgery, but with longer operating times and a longer hospital stay.

In spite of this, laparoscopy is still associated with more cases of urethral diverticula and transitory neurogenic bladder, whereas PSARP typically involves more urethral injuries, which usually have a good progression as they are treated intraoperatively[8]. This means the laparoscopic technique should be refined, and new approaches should be used to achieve results equivalent to those of open surgery.

Peña and Bischoff indications remain valid in institutions with little laparoscopic experience. However, with the

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new technologies and technical refinements, rectobulbar fistulas could be laparoscopically managed as long as the technique is accurate and rigorous.

Finally, non-surgical intestinal management remains essential in all atresias. The future will provide us with new technologies, such as robotic surgery, and others that are still to come but could further improve results.

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