Long Term Outcome of Laparoscopic Assisted Anorectoplasty in Management if High Anorectal Malformations in Males

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Abstract

Aim of the Study: The purpose of this study is to evaluate the long term outcome of laparoscopic-assisted anorectoplasty (LAARP) in management of male children with high-type anorectal malformation (ARM).

Method: Forty patients with high ARM were operated between January 2005 and January 2014 were reviewed. All of them underwent LAARP. Age at operation, type of fistula, associated anomalies, complications and degree of continence were evaluated. Bowel functions were assessed using the Cleveland Clinic Incontinence Score. Ethical procedures including obtaining informed consent were conducted in accordance with the ethical standards of the Committee on Human Experimentation of Cairo University.

Main Results: The mean follow up period was (6.4±2 years).The type of fistulae were recto-bladder neck and recto-vesical (45% and 55% respectively) . Rectal mucosal prolapse occurred in 40% of patients. The rates of normal continence (score 0:4) (25%), mild incontinence (score 5:9) (30%), moderate incontinence (score 10:14) (30%) and severe incontinence (score 15:20) (15%). None of our patients included in the study suffered from constipation.

Conclusion: The long term functional outcomes after LAARP was satisfactory apart from rectal mucosal prolapse, however LAARP is a suitable method for management of ARM patients with higher type fistulae.

Keywords: *LAARP, PSARP, male imperforate anus, high anorectal malformation.*

Introduction

Since laparoscopically assisted anorectoplasty (LAARP) was first described by Georgeson et al[1] as an alternative to posterior sagittal anorectoplasty (PSARP), it has gained popularity for the management of patients with high anorectal malformations (ARMs). Surgeons adopting this approach believe that it offers advantages in terms of a better cosmetic outcome, in addition to accurate placement of the pull-through rectum within the muscle complex without division[2-6]. However, to the best of our knowledge, there is a paucity of articles comparing the functional outcomes of the two approaches[2, 6-12]. The aim of this study was to evaluate the long-term outcomes and complications of LAARP for high types of imperforate anus in males.

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Materials and Method

Patient Demographics: We reviewed the data of male patients of imperforate anus with high fistulae who underwent surgery in our institution from January 2005 to January 2014. Forty Five patients were operated on during this period and were asked to attend our paediatric colorectal clinic for assessment. All of them were managed by LAARP. Closure of colostomy was done for all patients after reaching the desired size of anal dilatation. Five patients were either lost to follow-up or refused to participate in our study. Patients with

sacral anomalies were excluded from the study.

The median ages of the patients at the time of assessment were 7.5 (range: 4-11) years. Operations were performed by a single surgeon. LAARP was performed as described by Georgeson et al[1]. Types of malformations were identified according to colostogram findings and were confirmed by operative findings (Fig. 1). 22 patients had recto-vesical fistulae, while 18 patients had recto-bladder neck fistulae.

Patients were reviewed retrospectively. The age at operation, associated anomalies and complications were compared.

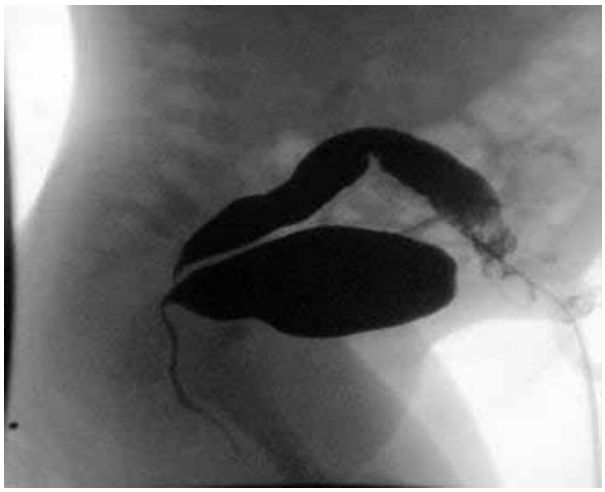

Fig 1: Distal colostogram showing Rectobladder neck fistula

Complications: The postoperative complications were evaluated. We examined anal stenosis, rectal prolapse and malposition of the rectum. The colon position within the muscle complex was assessed by MRI for patients suffering from any degree of incontinence. Malposition was defined as misplacement of the rectum outside the muscle complex along any length of the tunnel[10].

Functional Results

Bowel control for patients older than 3 years was assessed. Functional assessment was performed using the Cleveland Clinic Incontinence (CCI) score[13]. In this scoring system, the frequency of incontinence, in addition to the extent to which a person's life is altered, is evaluated using 5 questions assessing the type of incontinence (solid, liquid, gas, wears pad, lifestyle alteration). The frequency with which each type of incontinence occurs is rated on a scale from 0 (never) to 4 (always or 1/day). The frequencies are added to yield a total score, which can range from 0 to 20, with higher scores indicating higher levels of incontinence. A good outcome was considered when the patient was continent (score 0-4) or had mild incontinence (score 5-9). Poor outcome patients were those presenting with moderate (score 10-14) or severe (score 15-20) incontinence. Sphincter squeezing was assessed using Kelly's score[14]. Pena's criteria were used for assessment of constipation[15].

Statistical Analysis: Data were analysed using SPSS version 23. Student's t test was used to compare the mean age at operation, type of fistula and associated anomalies. The chi-square test was applied to compare the postoperative complications and the functional outcome. A value of $P<0.05$ was considered statistically significant.

Findingss: No statistically significant difference was observed for the age at the time of operation. Also no statistically significant difference was found between the types of fistulae included in our study, 22 patients had recto-vesical fistulae while 18 cases had recto-bladder neck fistula (55% vs 45% respectively).

All patients were followed up for more than 3 years; the median follow-up period was 6.4±2 years. Regarding anal stenosis occurred only in 2 cases (5%) while rectal prolapse was significantly more in our patients (Fig. 2). It occurred in 16 cases by a rate of 40% which is a high percentage.

Malposition of the rectum was found only in 2 cases (5%) while centrally positioned rectum was found in 95% of patients (Fig. 3A, 3B). If MRI failed to show a centrally placed rectum within the muscle complex, we termed it malposition of the rectum. The rate of strong sphincter squeezing (score 2) was found in 25% patients (10 cases). However, patients with weak squeezing (score 1) were (10%) 4 cases. Significantly more patients had no squeezing (score 0) (65%) 26 cases. None of our patients experienced recurrent fistula or rectal retraction.

The rates of voluntary bowel control (score 0-4) was found in 25% of patients, mild incontinence (score 5-9) was found in 30% of patients, moderate incontinence (score 10-14) was found in 30% of patients and severe incontinence (score 15-20) was found in 15% of our patients. Furthermore, none of our patients complaining of constipation.

Fig 2: Rectal mucosal prolapse post LAARP

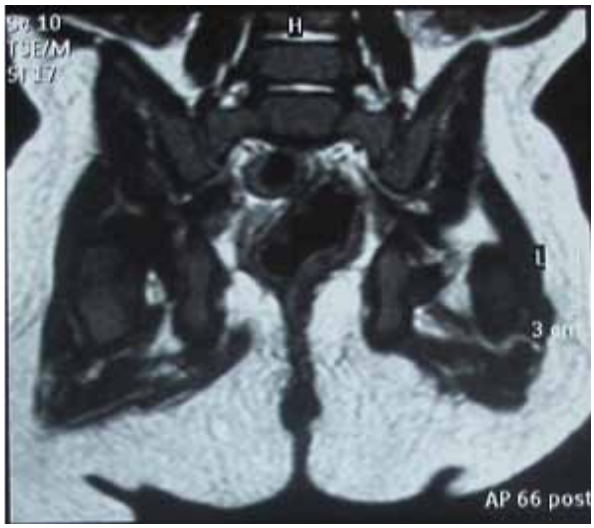

Fig 3A : MRI coronal section with centrally positioned rectum

Fig 3B: MRI sagittal section with centrally positioned rectum

Conclusions

We concluded that LAARP has satisfactory long-term outcomes. LAARP might even offer an advantage for patients with high recto-urinary fistulae presenting as recto-bladder neck and recto-vesical fistulae. LAARP is associated with a higher incidence of rectal prolapse. We recommend modification of this technique by performing application of an anchoring stitch on the rectum to the presacral fascia. Nevertheless, performing a study with a larger sample size and longer follow-up period is recommended to obtain more reliable results.

Level of Evidence: Level III.

Discussion

Although PSARP is the classic approach for cases of recto-prostatic and recto-bulbar fistulae[16,17], LAARP has been gaining popularity for treating patients with recto-bladder neck and recto-vesical fistulae. Indeed, the advantages of LAARP outweigh those of PSARP in terms of limited pelvic dissection, precise centralization of the rectum within the muscle complex and puborectalis muscle without division, preservation of the levator ani and muscle complex, accurate assessment of the fistula site, and reduced pain and wound complications, in addition to improved cosmesis[18]. However, no consensus exists on either approach in terms of long-term bowel control[19]. To the best of our knowledge, only a limited number of research studies that assess the long-term results of both approaches have been performed.

Rectal prolapse occurred in 40% (16/40) of our patients after LAARP. The rate of rectal prolapse post-LAARP ranged between 8.8% and 46%[3,20,21]. Jung et al[22], similar to our results, found rectal prolapse after LAARP in as many as 52% of patients. There are two possible explanations for this finding: the more rectal dissection associated with LAARP as well as a lack of rectal fixation within the muscle complex might contribute to this increased incidence. Therefore, some authors recommend the application of an anchoring stitch between the rectum and presacral fascia to avoid such complications during LAARP[23]. Bischoff et al reported a higher incidence in patients with recto-bladder neck and recto-vesical fistulae as a result of poor sacral and pelvic musculature[21]. Hence, securing the rectum to the presacral fascia, in addition to limiting rectal dissection, is essential to avoid such morbidity[21].

MRI was used to assess the position of the rectum

within the muscle complex in all cases. Only two patients (5%) had their rectum pulled away from the midline, despite that all patients were operated on by experienced paediatric surgeon. Patients with deviation from the midline and suffering from faecal soiling underwent redo anorectoplasty through a posterior sagittal approach. These results were similar to Tong QS et al[4], who reported a lower incidence of malposition of the rectum after LAARP. In contrast, Elbarbary MM et al[24] reported a higher incidence of malposition with LAARP. They assessed the centralization of the rectum at three transverse levels (levator ani, muscle complex and external anal sphincter); non centralized cases were either anterior in relation to the external anal sphincter or deviated to the right side of the muscle complex.

Anal stenosis occurred only in 5% (n=2) of patients. No patients experienced rectal retraction or recurrent fistula.

Regarding constipation, none of our patients suffered from constipation. a proposed explanation is that the preserved muscle complex in LAARP decreases the incidence of postoperative scarring, hence avoiding the associated decreased rectal sensation and subsequent recto-sigmoid dilatation with constipation and overflow soiling.

Concerning bowel function and soiling, LAARP appears to result in better long term outcomes. Kudou S et al[3] and Ming AX et al[12] found that LAARP and PSARP patients had similar bowel habits, despite that the age at the time of evaluation of faecal continence was younger in the LAARP group in both studies, suggesting that anorectal function in the LAARP group would improve over the long term. Additionally, in a Japanese multicentre study[7], faecal continence was evaluated using two types of scoring systems: the Kelly score and a newly developed system, the Japanese Study Group of Anorectal Anomalies Follow-up Project (JASGAP), which compared PSARP and LAARP and found no statistically significant difference.

Source of Funding: Self funding

Conflict of Interest: Age of pull-through and time at which bowel continuity was restored were relatively greater than those of other studies. This is due to the lack of specialized paediatric colorectal centres in the country and a large case load in our institution, in addition to reluctance of some caregivers as a result of low educational standards. Also, we used only the Cleveland Clinic scoring system to assess the functional outcome, which lacks objective parameters such as manometry. However, we believe that the history given by parents is the most important parameter to assess bowel control, rather than dependence on numerical values that may not reflect the patient's lifestyle

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