

Technique and outcomes about a new laparoscopic procedure: the Pelvic Organ Prolapse Suspension (POPS)

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SUMMARY: Technique and outcomes about a new laparoscopic procedure: the Pelvic Organ Prolapse Suspension (POPS).

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Pelvic organ prolapse suspension (POPS) is a recent surgical procedure

for one-stage treatment of multiorgan female pelvic prolapse. This study evaluates the preliminary results of laparoscopic POPS in 54 women with a mean age of 55.2 and a BMI of 28.3. Patients underwent at the same time stapled transanal rectal resection (STARR) to correct the residual rectal prolapse. We had no relapses and the preliminary results were excellent. We evaluated the patients after 1 year follow-up and we confirmed the validity of our treatment. The technique is simpler than traditional treatments with an important reduction or completely disappearance of the pre-operative symptomatology.

KEY WORDS: POPS - Prolapse - Laparoscopy - Pelvic floor.

Introduction

Symptomatic pelvic organ prolapse (POP) can have an important impact on general health-related quality of life (QoL) and interfere, as a disability, with physical mobility, pain, emotional reaction, social isolation, energy and sleep (1). The impact of pelvic floor disorders on health related QoL is similar to the impact of other chronic and debilitating conditions as stroke, cancer, diabetes and dementia (2). Lifetime risk of undergoing at least one surgical procedure for prolapse and urinary incontinence (UI) is 11-18 % by the age of 79 years old and the reoperation rate for recurrence of these disorders is 29,2% (3). Over the next 30 years, demand for services to care for female pelvic organ diseases will increase at twice the rate of growth of the same population and the number of surgeries for UI and POP will increase substantially over the next 40 years (4). The high

prevalence of POP results in high socio-economic costs and a significant impact on quality of life of these patients.

Literature review in terms of colorectal pathology brings out some important observations: there is an unacceptable percentage of obstructed defecation syndrome (ODS) not resolved with conventional surgical procedures. The impact of surgical correction of prolapse symptoms on ODS remains unclear. There are few studies that explore this issue and the data that exist are mixed. Several studies suggest an improvement in constipation levels (5), while others demonstrated a worsening in symptoms or a significant degree of new-onset constipation (6). Furthermore, pre-operative clinical and instrumental evaluations rarely include anatomical-functional examinations of the rectum, thus neglecting that the rectum is one of the pelvic organs that has a high impact in pelvic dynamic, being daily more subjected to mechanical strains. If ODS persists or is created *de novo* in patients undergoing surgery for POP, this often results in intense straining which represents a daily mechanical stress on all the pelvic organs and supporting structures. We do not exclude that this could be a major cause of the high rate of relapse after conventional surgery. For these reasons, we believe that correcting ODS is a prerequisite in order to avoid relapses and im-

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prove the quality of life. This is achieved by avoiding procedures that interfere with the rectal function, such as the closure of Douglas, and that correct the rectal prolapse and rectocele. Based on these assumptions, we employed the POPS (Pelvic Organs Prolapse Suspension) and we report the surgical technique and preliminary results.

Patients and methods

We enrolled 54 women with symptomatic pelvic organ prolapse. The interview and some investigations were part of routine preoperative and postoperative assessment. Standard history consisted in age, parity, Body Mass Index (BMI), menopausal status. Symptoms and signs about multiorgan pelvic prolapsed were ODS, fecal incontinence, rectocele, rectal prolapse, enterocele, stress urinary incontinence, urinary urgency, distance of vaginal vault to sacro-pubic line. We used specific Longo score to assess ODS and Wexner score to evaluate impairment of fecal incontinence. We examined the patient in gynecological position following these steps: perineal examination, combined rectal and vaginal examinations at rest and under straining. We staged uterine prolapse by a speculum, using "Half way system". All patients underwent preoperative cytology of the cervix and ultrasound examination of the uterus to detect abnormalities. Urodynamic studies, including uroflowmetry, cystomanometry, pressure flow studies and residual urine volume, were reserved for patients affected by urinary disorders. Rx dynamic pelvigraphy (contrasting bladder, vagina, rectum and bowel) were performed in all patients. This examination gave us the following parameters: rectocele depth, extent of rectal prolapse, distance between the vaginal vault and sacro-pubic line, grade of cystocele, distance from the vaginal vault to the pubis and to the sacrum, descent of the perineum at rest and under maximum strain, the distance from the most caudal point of Douglas compared to the sacro-pubic line. Follow-up is planned at 1, 3, 6, 12 months: we repeated the questionnaire regarding pelvic organ prolapse disorders, clinical evaluation, ODS and fecal incontinence scores. We repeated Cinedefecography 3 months after surgery. The study program follows all patients for at least 1 year, final data are under review and statistical analysis, however the preliminary results, are very interesting.

Laparoscopic surgical technique

We treated all patients before surgery with enema the same day of the operation and antibiotic prophylaxis (2 g Cephalosporin). General anesthesia was necessary in all cases. We placed the patient in lithotomy position with both arms near the body and the thighs spread moderately and bent upwards. After appropriate preparation and draping, we introduced a Foley catheter in the bladder and a circular anal dilator (CAD) of PPH kit (Ethicon Endo Surgery) through the anus and we fixed it by four stitches. We assessed the extent of rectal prolapse through a gauze mounted on a Klemmer clamp. The *équipe* position was: surgeon on the right side of the patient, first assistant to the left side of the surgeon, second assistant between patient's legs. The pneumoperitoneum was established via subumbilical open technique, and a 30° laparoscope was introduced. One 10 mm trocar was inserted under vision into the cross-between umbilical-transverse line in the right side and another 5 mm trocar was inserted symmetrically in the left side. The procedure included the following steps:

- 1) Peritoneum cavity exploration and patient in Trendelenburg (30° degrees).
- 2) A vaginal valve was pushed up the anterior fornix for adequate exposure into the pelvic peritoneum.

- 3) Using a 30x30 cm Prolene mesh (Ethicon J&J), V-shaped 25 cm length strips and 2 cm wide were prepared.
- 4) The mesh was introduced into the abdominal cavity through 10 mm trocar; 2-cm incision of the peritoneum, in the apex of the anterior vaginal fornix was made and the mesh was fixed by a n. 0 prolene stitch on the anterior vaginal vault or on the vaginal apex if the patient had hysterectomy.
- 5) On the right side, a 2-cm cutaneous incisions were made 2 cm above and 2 cm posteriorly to the anterior superior iliac spine. The aponeurosis of the external oblique muscle was incised and dissociating the fibers of the internal oblique and transverse abdominus muscles by scissors, the sub-peritoneum was reached. Through this incision a long Klemmer was introduced, and we can follow it through the transparency of peritoneum.
- 6) With this clamp, under laparoscopic vision a subperitoneal tunnel is practised until you reach the anterior fornix of the vagina. The tunnel passes 2 cm above the peritoneal reflection, 2-3 cm below the insertion of the round ligament in the internal inguinal orifice. So stretching the broad ligament with an upward pull, the tunnel is practiced in its lower third, reaching the anterior vaginal fornix; the tip of the clamp is then forced out of the peritoneal incision previously practised, one end of the V-mesh was taken out and pulled out through the sub-peritoneal tunnel.
- 7) Following the same steps the left strip of the mesh was pulled out.
- 8) The mesh was fixed to both the lateral vaginal fornices by two further stitches of 0 prolene. Pelvic organ suspension was achieved by making symmetrical tractions on both mesh strips.
- 9) The second assistant informed when the vaginal vault was suspended at the desired level to completely reduce the vaginal prolapse but avoiding excessive tension on the vaginal walls. This adjustment took place after exsufflating the CO₂.
- 10) Five cm of excess mesh strip was positioned tunneling the muscle's fascia, above the incision, and fixed by stitches vicryl 2 / 0. Skin was sutured with an intradermic suture. In the event that a hysterectomy has been performed we use two separate meshes, a right and a left that is sutured at the apex of the lateral walls of the vagina, remaining below perineum, thereby avoiding the possibility of contamination of the mesh due to the opening of the vagina and erosion of the mesh on the top of stump. In the event that the vaginal prolapse is prevalent posteriorly, the mesh is fixed on the posterior vaginal fornix; a uterine manipulator is useful because it offers appropriate exposure of the posterior vaginal fornix and Douglas pouch. In cases of advanced cystocele with redundancy and dystrophy of the anterior vaginal wall, the bladder-vaginal space is opened and to the V-shaped mesh another 5 cm wide and 10 cm long mesh is sutured, which will be applied and fixed in the vesico-vaginal space. The plication of round ligaments can be associated to this basic procedure in order to avoid uterine retroversion, raising Douglas by suspending the round ligaments to prevent uterine retroversion, raising Douglas suspending the anterior peritoneal surface to the mesh by making two small incisions on the iuxta-cervical broad ligament. Any sigmoid-rectal intussusceptions are corrected by fixing the meso-sigma distal to the left branch of the mesh. At the end of the procedure, through the circular anal dilator (CAD), an evaluation of the rectal prolapse was performed. If a residual recto-anal prolapse and /or an anterior rectocele persisted a STARR (Stapled Trans-Anal Rectal Resection) procedure was performed. Indications to the laparotomic approach are: previous Wertheim hysterectomy or other complex operations in the pelvis via laparotomic access, if hysterectomy for fibromatosis is planned, if a mesh for the reinforcement of the anterior vaginal wall and vaginoplasty is necessary.

The patient was discharged two or three days after surgery.

Results

The data concerning 54 patients are in Table 1. We notice that 46 (85.18%) were in menopause. Symptoms of obstructed defecation were present in 47 patients (87.04%), while 7 (12.96%) suffered from active fecal incontinence. Using preoperative RX cinedefecography we found rectocele and rectal prolapse respectively in 49 (90.74%) and in 45 (83.33%) patients. Enterocele was detected in 38 patients (70.37%), but it is likely that, in some cases, the occlusion of the pelvis by the uterus impedes the visibility of these alterations. We also assessed the descent of the vaginal vault to the sacro-pubic line; in Rx pelvigraphy it was 4.3 cm. The mean operative time in patients with VLS POPS without additional procedures was 85 minutes (range 50 ' - 95'). Blood loss during POPS steps was almost always negligible, however intra- or postoperative transfusions were never required. The most frequent surgical complication (Table 2) was defecation urgency in 9 patients.

Follow-up is planned at 1, 3, 6, 12 months. We repeated: questionnaires regarding pelvic organ prolapse disorders; clinical evaluation; ODS and fecal incontinence scores. We repeated Cinedefecography 3 months after surgery in patients with surgical complications. There were not cases of *de novo* dyspareunia, and all patients with this preoperative affliction reported cure or significant improvement. The anatomical results evaluated clinically by "Half way system" were excellent, in particular hysterocoele was well corrected in 100% of cases. The pelvigraphy confirmed the excellent anatomical results: in only 1 patient a residual recto-anal intussusception and a residual rectocele was detected; she underwent STARR for symptoms of ODS. There was a significant improvement in the descent of the perineum, especially in patients associated to STARR. We did not find cases of vaginal prolapse relapse. We observed a great reduction about the distance between vaginal vault and sacro-pubic line (0.4 cm).

Discussion

We are aware that the proposed technique, if taken into account by urogynaecologists, will raise several arguments and will raise many doubts and perplexities. For this reason we wanted to develop a sufficiently long follow-up and many case studies with data to support our claims. We received by other colleagues who applied POPS, results that confirm that POPS associated to STARR procedure, produce more effective results than those reported in literature with traditional techniques, both trans-vaginal and colposacro-suspension. The high percentage of ODS in patients undergoing conventional

TABLE 1 - GENERAL DATA CONCERNING 54 PATIENTS. We notice that 46 (85.18%) were in menopause. Symptoms of obstructed defecation were present in 47 patients (87.04%), while 7 (12.96%) suffered from active fecal incontinence. Using preoperative Rx cinedefecography we found rectocele and rectal prolapse respectively in 49 (90.74%) and in 45 (83.33%) of cases. Enterocele was detected in 38 (70.37%), but it is likely that, in some cases, the occlusion of the pelvis by the uterus prevents the visibility of these alterations. We also assessed the descent of the vaginal vault to the sacro-pubic line; in Rx pelvigraphy it was 4.3 cm.

N°= 54 patients	Preoperative	Postoperative (follow-up: 1 year)
Age	55.2	
ODS	47 (87.04%)	4 (7.40 %)
BMI	28.3	
Menopause	46 (85.18%)	
Multiparous	50 (92.59%)	
Fecal incontinence	7 (12.96%)	0 (0.00%)
Rectocele	49 (90.74%)	4 (7.40%)
Rectal prolapse	45 (83.33%)	4 (7.40%)
Enterocele	38 (70.37%)	7 (12.96%)
Stress urinary incontinence	43 (79.62%)	5 (9.25%)
Urinary urgency	31 (57.40%)	3 (5.55%)
Distance of vaginal vault to sacro-pubic line	4.3 cm	0.4 cm
Relapses		0 (0.00%)

TABLE 2 - SURGICAL COMPLICATIONS IN THE IMMEDIATE POST-OPERATIVE TIME. Blood loss during POPS steps was almost always negligible, however transfusions intra-or postoperative were never required. The most frequent surgical complication was defecation urgency in 9 patients.

SURGICAL COMPLICATIONS	N°
Defecation urgency solved without drug therapy	9 (16.66%)
Defecation urgency solved with drug therapy	2 (3.70%)
Urinary retention	3 (5.55%)
Transfusions	0 (0%)

surgery for POP may be the cause of the high recurrence rate. In fact, ODS inducing more straining for evacuation, causes a more mechanical stress to the pelvis. It may, therefore, be a cause of partial or total recurrence. We reiterate that the rectocele is certainly a primary disease of the rectum, the dilation is due to a thinning or disappearance of the muscular layer of the distal rectum; posterior colpocele and related anatomical and structural alterations of the posterior vaginal wall must be considered secondary alterations. Therefore applying a mesh

between the rectum and vagina, while giving back a new look to the vagina, does not solve the cause and symptoms of ODS, increasing moreover the rate of dyspareunia and complications. In addition, the rectocele continuing to push on the mesh can be able to bring about recurrence colpocele and erosion of the mesh. For these reasons, the STARR, resecting rectocele and restoring muscular continuity, in addition to correcting recto-colpocele improves ODS. Any excessive posterior vaginal redundancy can be corrected by stretching and suturing the posterior vaginal fornix to the subperitoneal mesh of the POPS. The preservation of the uterus, suspending it in a natural position, involves significant surgical, functional and psychological benefits. In fact, all the complications related to hysterectomy are avoided, the uterus will continue to divide the pelvis into two compartments and modulate straining for evacuation and urination and at the same time prevents excessive dilation of bladder. Finally, we found that hysterectomy for women is a serious psychological trauma that can affect sexual activity. In reviewing the literature, we found that even Kapandji (7), in 1967, had proposed the suspension of the vagina, by tense subperitoneal skin-strips from the anterior superior iliac spines to the vagina. In the original description the

author completed the technique with routinely Douglassectomy and plastic of round ligaments. This of course leads to excessive anteriorization of the vagina resulting in the widening of the space of Douglas. In addition, the stiff suspension of the iliac spines prevents the natural movements of the vagina. However, the advantages of the lateral suspension is commendable.

Conclusions

In conclusion we believe that the procedure proposed by us was excellent in patients with the vagina walls elongated and that retain a good trophism. Our proposal must be understood as a contribution from coloproctologists to gynecologists for a better comprehension of the rectum's role in this surgery. We emphasized that the genital apparatus represents also the anatomical support for the bladder and rectum and, therefore, inevitably the genital prolapse implies serious anatomical and functional alterations of these organs. Obviously, the gynecologist remains a specialist to refer for POP, but it is desirable to have a greater multidisciplinary collaboration.

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