

Total pelvic organ prolapses and its surgery with meses: Adventure or cure?

Abstract

Total pelvic organ prolapse is a condition that is frequently seen in elderly women and presents with defecation and urinary system dysfunctions and impairs quality of life.

Study objective: While preparing this study with its results, our aim was to evaluate the positive effect of minimally invasive repair with mesh on impaired organ functions, anatomy and quality of life in patients with obvious pelvic organ prolapse.

Design: Among the people who applied to the gynecology and proctology outpatient clinic within a certain time period, the files of the patients with complaints stated below were scanned. The determined parameters were collected and evaluated prospectively. Statistical study was done with SPSS 15.0.

Patients: The patients were those who applied to the gynecology and proctology outpatient clinic. Patients with complaints of vaginal/pelvic fullness, constipation, fecal incontinence, and prominent vaginal tissue prolapse between the legs were selected to participate in the study.

Measurement and main results: Laparoscopic promontofixation was performed on 8 patients with overt pelvic organ prolapse (POP-Q III and IV), among those who applied to the outpatient clinic with complaints of pelvic fullness, pain, difficult urinating, constipation or overt organ prolapse between 2015-19. Pelvic dysfunction, difficult urination and defecation function of these patients were evaluated. Pelvic organ distress, urinary distress, and colorectal distress inventory questionnaires were administered to the patients before and during follow-up and the measurements were compared. Complications related to surgery and recurrence was also monitored during follow-up. In those patients followed for an average of 29.5 months. Surgical recurrence was observed in one patient and various surgical complications were observed in 4/8 patients. At the end of the comparative evaluation of the questionnaires, it was determined that the patients' pelvic function and difficult urination improved with surgery. However, an improvement could not be demonstrated in defecation function.

Conclusion: Laparoscopic promontofixation should be kept in mind as a surgical method that can provide functional improvement in selected patients with overt pelvic organ prolapse.

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Introduction

Pelvic organ prolapses (POP) is a troublesome condition that affects multiparous women, reduces the quality of life and causes pelvic dysfunction. It is symptomatic in only 12%, although it is present in an average of 40% elder individuals. Those symptomatic women face to surgery in their lifetime about 10-13%.^{1,2}

POP is the protrusion of the uterus, vagina, female bladder and/or post hysterectomized vaginal cuff with small or large bowel throughout the birth route. This is sort of perineal herniation seen after the weakness of the main ligament and muscle structures. It is possible that the combination of anatomic, genetic, reproductive factors and lifestyle influence in a woman life³ Pelvic organ prolapse categorizes 3 compartments. In such a herniation both anterior wall prolapses (cystocele) and posterior wall prolapse (rectocele) will occur. Vaginal vault prolapse will come down and become visible. POP is common in females over 50years old and multiparous ones. Obesity, previous pelvic surgeries, chronic constipation that makes intraabdominal pressure increased and heavy sports have the same effect and poor living conditions are also factors in the emergence of POP.⁴⁻⁶ As the weight starts to increase. A progress from bulge to prolapse is seen. There is no regression with weight loss. Forty percentages of elder females has a clinical finding. But 10-12% of

these people have their daily life adversely affected. Nearly half of the patients (40%) have difficult urinating, stress incontinence (37%), and difficulty in defecation (50%). Defecation can be facilitated by pressing (splinting) the posterior wall of vagina.⁷ The symptoms are not related how big or where to locate the bulge.^{8,9}

The POP is a dynamic state. The upper part of the vagina in woman is horizontal in normal situation when she is standing. The increase in intraabdominal pressure makes this position semi-vertical then the genital orifice widens. The main factor that keeps the pelvic floor in its anatomical position is the levator ani muscle and fibrous ligaments (cardinal and uterosacral ligaments). Where the fibromuscular structure together is known to prevent collapse of pelvic floor. The levator muscle makes an important part of pelvic floor. It has been reported that the pubovesical part of this muscle is damaged in 34-55% of patients with pelvic prolapse. In normal women the damage rate is 16%. Damage to the muscle is seen in 13-36% of women who have had a normal delivery. Damage to the levator muscle is one of the most important causes of enlargement of the vaginal orifice and initiating the descent. In this region atmospheric and abdominal pressure are in balance. However, if the vaginal wall collapses from the anterior to the level of hymen due to muscle injury or laxity, that creates a great pressure on fibrous structures which connect uterus and vagina to the pelvic bones.¹⁰⁻¹⁴

The aim of the study is to evaluate the anatomical improvement of the surgical procedures using mesh on pelvic organ prolapse, to see the adverse effects, and to show positive effect on patient’s daily life in short and medium follow-up period.

Patients and methods

Patients Among all individuals who applied to the gynecology and proctology outpatient clinics. Some of the patients applied with the complaint of only constipation. After a complete physical examination, it was found that there was also perineal prolapse. These women stated only constipation complaints because they applied to the proctology outpatient clinic. During course of the study the patients who had protrusion from the vaginal orifice when standing up or during defecation were selected. The average age of selected 8 patients in a certain time interval is 66 years. Most of all have had previous perineal surgery. Body mass index (BMI) is in favor of obesity. Except for one, the others live partly sedentary. They are all multiparous women. Patients had complaints of difficult defecation and urinary incontinence also. The main complaint in this small group of patients was protrusion of genitalia. Although this situation made the diagnosis easier, it had a very bad effect on the patient’s quality of life. All our patients had additional complaints related to urination and defecation like stress incontinence and constipation (Table 1). The patients were those who had multiple deliveries, had a sedentary life, often had obesity problems, defecating more and more difficult because they neglected to go to the specialist for a long time, and had urinary incontinence. Some of them had previously had surgery in that area. When evaluated, the patients have one or more of the risk factors shown in Table 2.

Staging of the disease

There is multiple classification to consider when being staged the perineal prolapse. Of those, Pelvic organ prolapse-quantification system (POP-Q) was the most frequently used and we also used that classification^{7,15} in our patients (Table 3). We did not have a trouble making a quantification of POP. In all our patients, we observed that the lower genital tract tissues and organs came out of the vagina after a small effort. Of the patients all, applied as stage III or IV (Table 1) (Figure 1).



Figure 1 Total Pelvic organ prolapse, 2: after surgery perineal view.

Examination of the patients

During the examination, the patient should lie on her back (supine position) with her head raised at an angle 45 degrees. A patient with mass protruding spontaneously throughout the vagina or a mass in the vaginal space after the Valsalva maneuver done requires a complete physical examination. Diagnosis was done easily, as noted above. The urogenital organs were visible when the patient stood up or after the Valsalva maneuver with little effort, protruding through the vaginal route. To assess anterior wall, prolapse of vagina a fixed speculum is placed on the posterior wall as if to immobilize the wall and the patient is instructed to perform the Valsalva maneuver. To evaluate posterior wall, prolapse of vagina a reverse application is required. If a herniation as large as the first phalanx of the index finger is seen from out of the vagina during digital rectal examination (D’Allemare sign), that was stated as rectocele. If the diagnosis is not made at the end of the examination, the patient is raised, and same procedures are repeated. Further examination of the patient may also be required. If the patient has problems with urination, multi-channel urodynamic tests should be performed.^{16,17} That shows how much the patient will benefit from what kind of surgical procedure and gives information about whether

Table 1 Patients’ demographics, diagnosis and treatment characteristics

Age (years)	Delivery	Social Status	Previous surgery	Most common symptom	POP-Q classification	BMI (kg/m ²)	Vaginal discharge	Difficult urinating (DU)/ Stress incontinence (SI)	Difficult defecation (DD)	Surgery (2 Meshes promonto fixation)	PO complications	Follow-up (mo.s)
67	4	Housewife	H-BSO	prolapse	IV	33	discharge	SI	DD	yes	SBO	54
64	2	Teacher ®	H-BSO	prolapse	IV	27	Discharge + ulcer	SI	.	yes	Mesh displacement (recurrence)	47
71	3	Housewife		bulge clearly visible	III	41	N/A	SI	.	yes	.	36
68	5	Housewife		prolapse	IV	30	discharge	DU	DD	yes	Bleeding	31
77	3	Nurse (R)	Hysterectomy	prolapse	IV	31	ulcer	SI	.	yes	.	27

Table Continued...

Age (years)	Delivery	Social Status	Previous surgery	Most common symptom	POP-Q classification	BMI (kg/m ²)	Vaginal discharge	Difficult urinating (DU)/ Stress incontinence (SI)	Difficult defecation (DD)	Surgery (2 Meshes promontofixation)	PO complications	Follow-up (mo.s)
63	11	House maid		bulge clearly visible	III	42	discharge +ulcer	SI	DD	yes	.	21
61	2	Housewife	H-BSO	prolapse	IV	29	ulcer	DU	.	yes	SBO	17
57	5	Teacher (R)	Hysterectomy	prolapse	IV	27	discharge	SI	DD	yes	.	3

H-BSO, hysterectomy+bilateral salpingooforectomy; SI, urine stress incontinence; DU, difficult urinating; DD, difficult defecation; SBO, small bowel obstruction; PO, Postoperative

Table 2 Risk factors for pelvic organ prolapse⁵

	Risk factors
General	Age in advance
	Multiparity
	High body mass index
	Connective tissue diseases
Familial	Chronically straining
	Long history of prolapse
Intraabdominal pressure	Chronic constipation
	Chronic cough
Obstetrics	Heavy lifting
	Vaginal delivery (multiple)
Surgery	Previous Hysterectomy
	Previous surgery for POP

Table 3 POP-Q classification

Pelvic organ prolapse quantification (POP-Q) system 15	
Stage	Description
0	No prolapse
I	>1 cm above the hymen
II	≤1 cm proximal or distal to the plane of the hymen
III	>1 cm below the plane of hymen, but protrudes no farther than 2 cm less than the total vaginal length
IV	Eversion of the lower genital tract is complete.

She will benefit from surgical treatment. Further similar diagnostic tests should be performed for patient with chronic constipation.^{18,19} Anal manometry and anorectal examination must be performed to evaluate anal continence. Defecography and transrectal ultrasonography (TRUS) should be used when necessary. It was a common way to perform cine or MR defecography if the patient was suspected of having rectocele. On the other way TRUS was used.

Statistical analysis

In the study, there was small group of patients with a limited number of individuals underwent one type of procedure. The same surgery was performed on that group. While expressing the results, descriptive statistics were used and mean values with standard

deviations for numeric parameters were reported. Non-parametric test was applied while evaluating the comparative results. and $p < 0.005$ were considered significant.

Surgical procedure; transabdominal mesh repair

From 2015 to 2019 eight selected patients with overt perineal prolapse had undergone laparoscopic transabdominal mesh repair (promontofixation) (MR). The surgery was done laparoscopically. After entering the abdomen through 4 ports (2 of ports, 10mm and 2,5mm) the pelvis, where operating area was cleared. Anatomic structures such as promontorium, vascular structures and middle sacral vein etc. were revealed. Top of the promontorium was dissected to make the anterior sacral membrane visible. Dissection was started over the sacral promontory. The incision of the peritoneum was continued inferiorly and turn to left laterally at the slightly above the peritoneal plication.. The rectovaginal space was dissected. Then anterior wall of the rectum was reached. Deep dissection was performed on both edges of the rectum in order to reach to puborectalis muscle. Vesico-vaginal dissection in 1,5-2cm deep was performed. The posterior mesh (Y-shaped) was sutured to the puborectalis muscles bilaterally. The anterior mesh was sutured to the vaginal edge in vesico-vaginal place. Both meshes were fixed superiorly by suturing to the pre-prepared place on top of the promontorium. The meshes were attached to the promontory with acceptable tension using by non-absorbable suture or non-absorbable tackers. Then, pelvic peritoneum was closed on the meshes by laparoscopic suturing. In general, the patient undergoing surgery had no uterus at all. Hysterectomy (laparoscopic) was performed if it was required.

Results

The patient population in this article originating individuals applied to both outpatient clinics within specified time period was evaluated. Their mean age was 66 (57-77) years. It was seen that the mean number of vaginal deliveries was more than that was 4 (4,37, SD:2,9) births. A mean body mass index (BMI) of the patients was 32,6 (27-41). Four of the 8 patients had previously undergone hysterectomy procedures. The common feature of these patients was the pelvic organ protruding from the vagina and causing the main problem. In all patients, what came out of the vagina became visible with little effort. POP-Q classification was grade III/IV in all. Patients had either vaginal discharge or ulcers on the protruding vaginal mucosa. Stress urinary incontinence (SUI) was present in most patients (6/8 patients). Difficulties in defecation were another annoying sign which out of 8, 4 patients had. These patients were those who had completely collapsed pelvic floor (both anterior and posterior wall and central part) and

had urinary and defecations problems together. It is understood that pelvic floor muscle function is completely impaired in these patients. Surgical hanging of the organ alone would not be beneficial. For this reason, it was planned to perform promontofixation surgery for pelvic floor repair. Posterior repair (promontofixation) with mesh was performed laparoscopically (transabdominal). Two of them converted to open surgery due to technical difficulties.

All patients had difficulty in voiding. Half of the patients had difficulty in defecation before surgery. Complications were seen in 4 patients (50%) after surgery. Bleeding was an early complication in one patient. In the late postoperative period, small bowel obstruction was observed in 2 patients and displacement of the mesh was observed in 1 patient.

Pelvic floor impact questionnaire (PFIQ) was applied to patients before surgery. When bladder, bowel and vaginal functions were evaluated. The questionnaires were applied during the follow up to comprehend how much functional distress they had before the surgery and how effective the surgical treatment was. Those questionnaires were specifically evaluated in that limited series of 8 patient's undergone surgery with prosthetic mesh. Pelvic floor impact questionnaires (PFIQ-28) and urinary distress inventory questionnaires (UDI-6), coloanal distress inventory questionnaires (CADI-8), and pelvic organ prolapse distress inventory questionnaires (POP-DI-6) were administered to the patients before and after the surgery. While the patients were being followed up, it was reapplied to everyone reached, starting at least 18 months after surgery.

The questionnaires study was carried out during phone calls and inpatient visits to the outpatient clinic and little more than 1,5years after surgery. The mean follows up period of these patients was 29 months. The results of questionnaires evaluation applied to the patients before the surgery and during the follow-up are shown in Table 4. It was observed that the results improved after surgery when measuring the subgroups of both questionnaires (PFIQ and POP-DI). When the results were compared it was seen in this small cohort that the pelvic prolapse ($z=-2,03$, $p=0,043$) and urinary distress ($z=-2,02$, $p=0,043$) were significantly improved after surgery. However, we should take this result into consideration knowing that the problem with colorectal function does not give the desired result with this type of surgery ($z=-1,76$, $p=0,07$) (Table 5).

Table 4 the outcomes from Distress Inventory questionnaires

The results of pre-postoperative distress inventory questionnaires outcomes					
	N	Minim	Max	Mean	Std. Deviation
PFIQ Bladder-preop.	8	14,0	28,0	20,750	46,522
PFIQ Bowel-preop.	8	11,0	17,0	14,375	21,339
PFIQ Vagina-preop.	8	17,0	25,0	21,250	27,124
POP-DI 6	8	11,0	24,0	19,375	38,522
UDI-6	8	17,0	25,0	21,750	26,592
CADI-8	8	11,0	17,0	14,250	21,876
POP-DI 6 Follow-up	5	3,0	7,0	5,600	16,733
CADI-8 Follow-up	5	8,0	15,0	11,000	27,386
UDI-6 Follow-up	5	11,0	21,0	14,200	39,623

PFIQ, pelvic floor impact; POP-DI, pelvic organ prolapse-distress inventory; UDI, urinary distress inventory; CADI, colorectal distress inventory questionnaires

Table 5 it shows the analysis of the compared outcomes which measured pre and postoperatively

Comparing pre-postoperative distress inventory questionnaires's outcomes. ^b			
	POP_DI_FU - POP_DI	UDI_FU - UDI	CADI_FU - CAD
Z	-2,023 ^a	-2,023 ^a	-1,761 ^a
Asymp. Sig. (2-tailed)	.043	.043	.078

FU, follow-up; POP-DI, pelvic organ prolapse-distress inventory; UDI, urinary distress inventory; CADI, colorectal distress inventory questionnaires

Discussion

POP, which is more common in elder women, manifests itself with various symptoms and pelvic dysfunction. Most women wait until the symptoms of the disease become unbearable and may not go to the doctor. When signs of POP become apparent, it should be treated. If appropriate treatment is not given to the patient, it reduces the quality of life and adversely affects the patient. Treatments of woman with symptomatic pelvic organ prolapse include exercising the pelvic floor muscles, applying mechanical supports (pessaries) and surgical treatment. The goals of conservative treatment are to eliminate symptoms, reduce or arrest progression, and delay or avoid surgical treatment if possible. The patient's perception of the disease and related problems, and how helpful the treatment is, depend on both the degree of pelvic organ prolapse and how much the patient's expectation is.

There are two different treatment modalities that can be chosen for the treatment of POP. One of them is active exercise of the pelvic floor muscles and the other is one of the surgical methods. There are two different clinical approaches when it comes to surgery. The one is the point of view of obstetrician and the other is the point of view of colorectal surgeon. In fact, they are essentially similar approaches. However, several anatomical repair procedures have been demonstrated. In general, some surgical procedures prioritize tissue reinforcement with sutures, while other surgical approaches report anatomical repair with different type of meshes. An average of 11-19% of such patients required surgery in their life. In order to prioritize surgical application, it is necessary to score the degree of POP disease and to know how much it adversely affects urination, defecation and sexual functions. At the same time, the surgeon who will perform the procedure should clearly reveal whether the patient suffers from obstructive defecation diseases such as intussusception and rectocele. The surgeon has also skilled and known the results.^{2,20} However it was mentioned above, the use of various exercises and/or the use of pessaries for a non-life-threatening disease are prioritized. Surgery should be considered if there is no response to such treatments. While making that choice, the patient's expectations, and desire, improvement in quality of life and the experience of the surgeon (or center) performing the surgery are very important factors. As mentioned above, surgery is required for those in an average of 1-2/10 patients. Surgery is performed by suturing natural tissues in the anatomically defected area. However, after this treatment, 17-20% of the patients were reported to have a recurrence during follow-up. For this reason, the use of mesh repair method is accepted.^{19,21,22} When performing surgical treatment with mesh, respect with international guidelines should at least be kept in mind.^{23,24} Both the mesh related (such as texture, placement, shape, and size of the mesh) and patient related characteristics (obesity, inflammatory bowel disease, smoking etc.) will affect the surgical outcome. However, another matter as important as that is the experience of the surgical center or surgeon. As

it is known, large mesh size increases the complications.²⁰ Therefore, the use of mesh must be performed by an experienced surgeon (or center).

The incidence of complications after prolapse surgery and the deterioration of the patient's life quality in the recovery period are in question. Repeated surgery may be required as a complication what is more common in patients undergoing vaginal mesh surgery (VMS) compared to patients undergoing laparoscopic promontofixation (LP). Visible vaginal mesh is another serious complication. It is frequently seen in those who undergo VMS (12%). The incidence is 2-3% in surgery performed with LP or abdominal intervention.²⁰ Infection is another serious complication too. The proven risk of infection associated with mesh is quite small (<1%). However, when infection occurs, it is highly likely to be mesh related and colonize the mesh. Another important complication is mesh-fibrosis and it causes noticed pain. It can be seen at a rate of 4-11% related to type of the mesh used. De Novo dyspareunia is another complication seen with 14% in the literature, especially after the use of prolene mesh.²⁵

Before surgery, it was easy for patients to diagnose. However, in some of the patients, colorectal function was completed with physical examination and questionnaire study. For these patients, a rectal imaging, anal manometer, etc., showing the physiology of defecation. could not be done. After the same surgical procedure with meshes for all patients, functional evaluations were made with inventory questionnaires. The questionnaires reflect the changes in the urinary and defecation functions of the patients. All patients had difficulty in voiding. Half of the patients had difficulty in defecation before surgery. Complications were seen in 4 patients (50%) after surgery. Bleeding was an early complication in one patient. In the late postoperative period, small bowel obstruction was observed in 2 (25%) patients and displacement of the mesh was observed in 1 patient. Recurrence was seen in one (1/8- 12,5%) who had been re-operated, due to mesh migration.

On the other hand, for mesh use, it has been reported that especially porcine-derived meshes cause more recurrence than polypropylene meshes.²⁶ In a randomized study, after 5years of follow up, it was shown that anatomical recurrence was low in those operating by polypropylene meshes.^{27,28} It has been reported that silicone-coated polyester mesh and polytetrafluoroethylene-structured meshes used in sacrocolpopexy. In the study, we use small size polypropylene mesh. The end of each surgery the meshes were peritonialized under great care laparoscopically after suturing on the promontorium. It is possible to approximate to meshes to the promontory with tach also. But we did not use.

The small number of patients, the retrospective use of patient file data, the selection among patients from a single center outpatient clinic, the fact that one of the hospitals was a military hospital before, and the anatomical disorder being the main selection criterion are the shortcomings of this study.

Conclusion

In this small group of patients, laparoscopic promontofixation was performed and the patients were followed for a little over 2years. Patients had selected to undergo to the procedure, because exercise and other approaches are not therapeutic. Even though the number of patients was small, it was found that pelvic functions and urinary difficulty were improved in patients' wit POP who underwent the same surgery; complications and recurrence were also within the limits reported in the literature. Thus, Laparoscopic promontofixation is feasible and safe for the selected patients.

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Conflicts of interest

Authors declares that there is no conflicts of interest.

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