

Surgical management of posterior compartment defect in patients with pelvic floor dysfunction

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Abstract: **OBJECTIVE.** To find and assess a new surgical way of correcting posterior compartment defects according to the Integral System. **Method:** We performed a prospective study involving 82 patients with posterior compartment defects. We compared the results of 2 surgical methods: posterior intravaginal sling with sacrospinous fixation (PIVSSF) vs. posterior "patch" with sacrospinous fixation (PPSF). The research took place in The Clinical Hospital of Obstetrics and Gynaecology, Bucharest, Romania. **Results:** All patients who presented frequency and urgency improved their symptoms in both study groups. In all groups, there was a statistically significant reduction of pelvic pains and sacral pains. In those patients operated with PPSF, we found a significant improvement of haemorrhoids and urinary dysfunction compared with those operated with PPSF, with $p < 0,03$. **Conclusion:** PPSF might be an alternative method to solve posterior compartment defects, with fewer complications.

Keywords: Urogynecology; Pelvic floor; Posterior intravaginal sling; Posterior patch.

INTRODUCTION

The posterior compartment defects are the most challenging ones because the difficult anatomical spaces require complex surgical ways of approach and with serious potential complications.⁵ According to the Integral System, the aim of surgical treatment should be the recreation of the physiological disposition of ligaments.⁶ The keystone in re-establishing the apical anchoring system - level I in De Lancey classification is the posterior suspension of the uterus or the vaginal vault.¹ As we presented briefly in figure 1, there are 2 ligaments involved in the proper suspension level I: uterosacral ligaments and cardinal ligaments.

Biophysically, there are 2 vectors, one oriented posteriorly and one laterally, so the vectorial resultant should be oriented more or less in a lateral - posterior direction. The surgery must tend to fulfil this aim: the new structure must have a resulting suspension force oriented as mentioned before.

The posterior compartment approach is almost always intriguing. Laparoscopic sacrocolpopexy does not realize a convenient suspension of posterior vaginal fornix, because the final position is vertical, and does not respect the Integral System principles.⁷ The most appreciated element

used in surgical repair is the sacrospinous ligament. There are different techniques that use it for posterior suspension, using or not meshes. The first operation is Amreich – Richter, but now there are various techniques that require meshes.

The significant rate of complications limited this techniques worldwide, and especially in the USA.³ There is a possibility of rectal injury, haemorrhage in the ischiorectal fossa, nerve damage. Besides those, one may encounter infection or erosion of the mesh inserted. Considering this, we tried to find a simpler way of approaching the posterior compartment defects.

METHODS

The research took place in The Clinical Hospital of Obstetrics and Gynaecology "Prof. Dr. Panait Sârbu" in Bucharest. We performed a prospective study, involving 82 patients with pelvic floor dysfunction consisting in posterior defects. In this study we used 2 surgical techniques. The first one was posterior intravaginal sling with sacrospinous fixation (PIVSSF).⁴ It involves insertion of a posterior tape with the tunneller. This tape is afterwards suspended to the

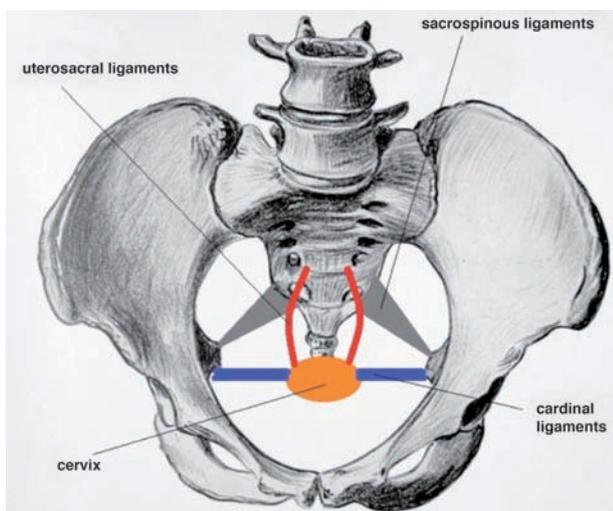


Figure 1. – The cardinal and uterosacral ligaments.

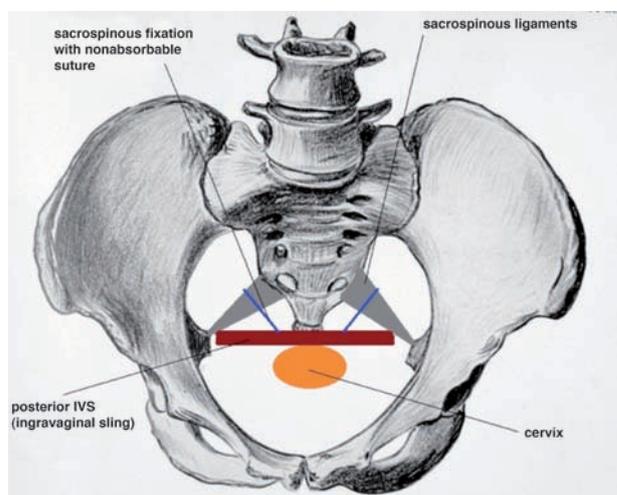


Figure 2. – The "in situ" disposition of posterior sling with sacrospinous fixation.

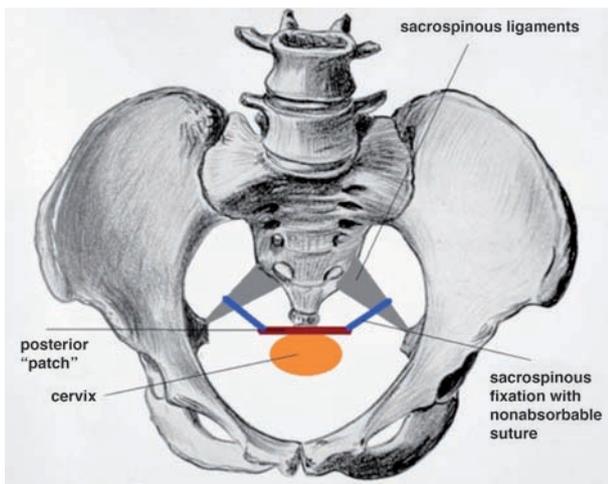


Figure 3. – The “in situ” disposition of posterior “patch” with sacrospinous fixation.

sacrospinous ligaments using the viper specially designed by Prof. Klaus Goeschen. There are few disadvantages with this method: the blind passage through the ischioanal fossa and the possibility of vascular and nerve damage, the potential injury of the rectum.

Even though, the final disposition respects the biomechanical targets - a posterior-lateral direction of suspension as we see in figure 2.

In attempting of avoiding those difficulties we tried to find a method which may provide an easier way of correcting these defects. We propose a method called posterior “patch” with sacrospinous fixation (PPSF). Thus, we used a polypropylene “patch” which was attached to the posterior side of the cervix or the vaginal fornix in cases with vaginal vault prolapse. This patch was also suspended to the sacrospinous ligaments - Figures 3 and 4.

We respected the biomechanical purpose, so we tried to evaluate the outcome. The initial group was divided in 2 subgroups: the first operated with PIVSSF, and the second one with PPSF. The statistics used student odd tests.

RESULTS

We analyzed both subgroups before and 6 months after surgery. All patients completed a pre- and postoperative questionnaire, benefited of clinical examination, preoperative urodynamics, pre- and postoperative echography.

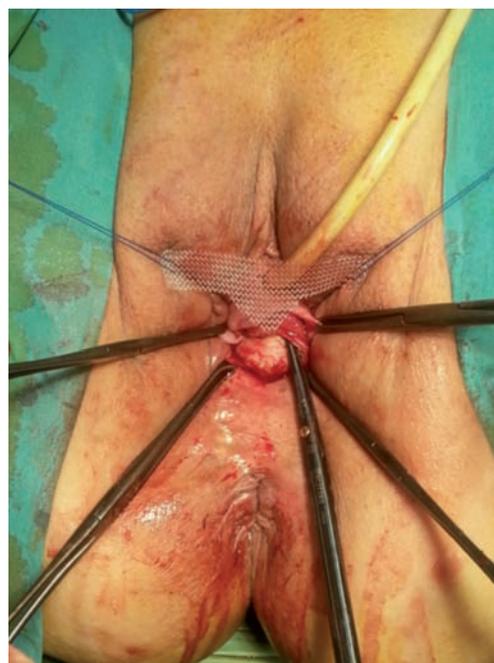


Figure 4. – The posterior “patch” - surgical view.

The anatomical results were similar in both groups - Figures 5 and 6.²

All patients presented symptoms like frequency, urgency and nocturia, pelvic pains or haemorrhoids. We studied the preoperative and postoperative dynamics of these variables within each group. We quantified frequency and nocturia with number of episodes per day and urgency, haemorrhoids and pelvic pains on a scale ranging from 0 to 3 in intensity as perceived by the patient.

After statistic analysis, with $p < 0.005$ in all subgroups, we found a postoperative improvement in these symptoms - Table 1. Analysing the uterine arteries velocimetry, we found a significant lowering of resistivity index in PPSF subgroup. A primary conclusion might be that this procedure significantly increases pericervical blood circulation.

Analysing both groups, we discovered a reduction of resistance index of uterine arteries in the PPSF subgroup.

Comparing the surgical outcome in these patients, we discovered a significant improvement in PPSF subgroup, with $p < 0.01$. All the other parameters taken into the discussion, did not differ significantly.

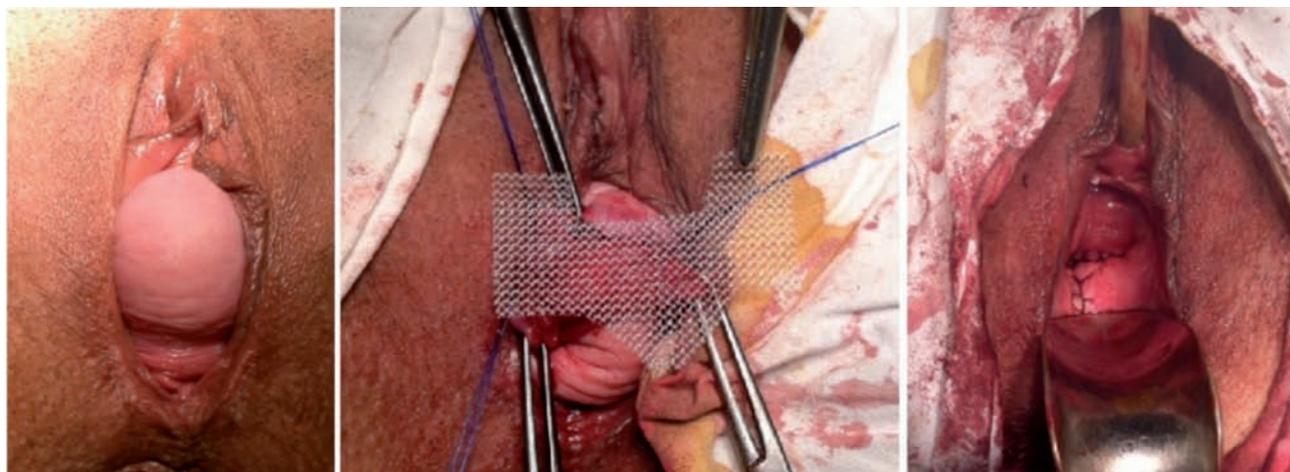


Figure 5. – PPSF in a patient with high degree of enterocele.

Statistics analysis of patients' variables.

M - mean value; SD - standard deviation; MSD - mean standard deviation; p - probability.

Variable	Probabilistic invariants	PIVSSF		PPSF	
		Pre	Post	Pre	Post
Frequency	M	8.12	6.06	9.57	6.79
	SD	3.84	1.85	5.09	1.99
	MSD	0.66	0.32	0.96	0.38
	p	0.000565		0.000554	
Nocturia	M	2.03	1.24	3.0	1.32
	SD	1.59	0.87	3.37	0.94
	MSD	0.28	0.15	0.64	0.18
	p	0.000285		0.00783	
Urgency	M	1.67	0.58	1.82	0.89
	SD	1.19	0.61	1.12	0.8
	MSD	0.21	0.1	0.21	0.15
	p	6.15E-07		8.5E-05	
Haemorrhoids	M	0.91	0.42	0.57	0.18
	SD	0.88	0.61	0.63	0.39
	MSD	0.15	0.1	0.12	0.07
	p	0.000214		0.00529	
Pelvic pains	M	1.03	0.17	0.82	0.25
	SD	0.73	0.27	0.55	0.52
	MSD	0.127	0.52	0.10	0.1
	p	4.84E-08		5.68E-05	
Right uterine artery RI	M	0.84	0.83	0.88	0.83
	SD	0.1	0.08	0.06	0.05
	MSD	0.02	0.02	0.01	0.01
	p	0.465224		0.000134	
Left uterine artery RI	M	0.84	0.83	0.88	0.84
	SD	0.08	0.08	0.07	0.05
	MSD	0.01	0.02	0.02	0.01
	p	0.325242		0.00924	



Figure 6. – 28 Years old patient with uterine prolapse, operated vaginally with PPSF.

CONCLUSION

There are some symptoms related to the posterior compartment defect that significantly improve after vaginal surgery. Apparently, correcting anatomy we may achieve restoration of function. This observation is conformable with Integral System. We may conclude that when these symptoms associate with pelvic floor disorders, they are surgically curable. They also presented a significant improvement in pelvic pains in both groups.

PPSF proved to be an easy way of correcting level I defect, with minimum complications. In this way we avoided the theoretical injuries associated with PIVSSF. It also provides a satisfactory anatomical result, yet to be verified after a longer period of time.

PPSF might have a better result in pelvic and pericervical blood circulation. The better cure of haemorrhoids and the improvement of uterine velocimetry plead for that idea.

Larger studies, multicentric and randomized, are required to a more profound understanding and for a validation of this surgical method.

ACKNOWLEDGEMENT

This paper is part of Dr. Enache Traian's PhD thesis, defended on 30.10.2014 at the "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania, with the title: "Surgical reconstruction techniques using alloplastic material in pelvic floor disorders"

REFERENCES

- DeLancey JOL, Hurd WW. Size of the urogenital hiatus in the levator ani muscles in normal women and women with pelvic organ prolapse. *Obstet Gynecol* 1998; 91: 364-8.
- Enache T, Marinescu B., Andreea Enache, Cristina Neagu. Surgical cure of enterocele and rectocele, a new perspective (case-report). *Obstetrică și Ginecologia, revista Societății de Obstetrică și Ginecologie Nr. LXI, Nr. 2 - Aprilie - Iunie 2013.*
- Food and Drug Administration. FDA safety communication: UPDATE on serious complications associated with transvaginal placement of surgical mesh for pelvic organ prolapse. Silver Spring (MD): FDA; 2011. Available at: <http://www.fda.gov/MedicalDevices/Safety/AlertsandNotices/ucm262435.htm>. Retrieved July 27, 2011.
- Farnsworth B, Goeschen K, Müller-Funogea A: *Life-SuRgery: Sacrospinous Fixation*. Würselen, 28.4.2008.
- Mueller-Funogea I-A., Enache T., Andreea Enache, Marinescu B., Cristina Neagu. "Elitrocelul și rectocelul. Tulburările anatomice și funcționale ale compartimentului vaginal posterior. Fiziopatologie și remediu terapeutic" - *Zilele Medicale "Vasile Dobrovici"* - Ediția XI-a, 24-26 mai 2012.
- Petros PE Papa, *The female pelvic floor - function, dysfunction and management according to the Integral Theory -*, third edition - Springer Verlag 2010.
- Petros P, *The Integral system* *Cent European J Urol*. 2011; 64(3): 110-119.

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