

Prolapse Surgery 4:

by Guenter K. Noé

Laparoscopic Sacro-Pexy

In 1910 the fixation of the vaginal apex to the promontory was described by Otto Kuestner [1, 2]. Via a laparotomy the cuff was sutured to the right side of the promontory. In most cases the vagina was stretched extremely with negative effects to the continence and resulting in enteroceles.

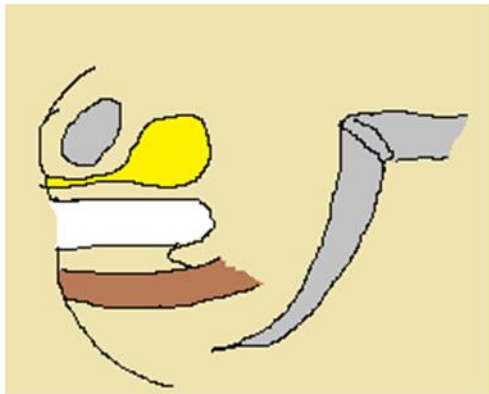


Fig. 4 Normal vaginal position

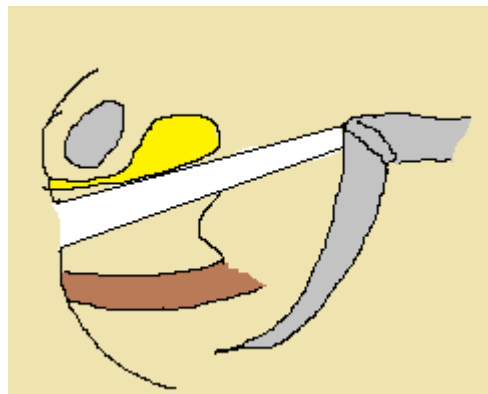


Fig. 5 Extension after fixation

G.A. Williams and A.C. Richardson in 1952 described an approach by using the aponeurosis fascia for the fixation of the apex. After a horizontal laparotomy the fascia was dissected into stripes of 1cm. The stripes were led around the rectus muscle lateral and sutured to the vaginal apex. As the fascia measured 7-8 cm maximal a relevant ventralisation resulted with a high risk of enterocele development. Heidenreich und Greve reported a success rate of 64% in 2009 [3].

Lane first described the implementation of mesh for sacral colpopexy in 1962 [4]. This enabled the surgeons to fix the vagina with low tension and in the natural position. One year later Ulfelder reported the successful performance of the same approach [5]. In the following years multiple variations were reported and many application studies have been published over decades [6-8]. Still Sacro-Colpopexy is defined the “Gold Standard” as reference for new approaches.

Nowadays there are two types of sacro-colpopexy dominating the scene.

- One way is to fix the vault by a Y-shaped mesh, fixing 2 or 3 cm of the anterior and posterior part of the vagina. Additionally vaginal or concomitant laparoscopic procedures are performed.
- The other way is to perform an extensive preparation of the vaginal anterior and posterior wall. Anteriorly the vagina is exposed until the urethra is reached. Posteriorly the complete recto-vaginal septum is opened and the levator muscles are cleared. An extended Y-shaped mesh or additional meshes are fixed as deep as possible. The fixation is performed by suturing, tackers or glue.

Most surgeons fix the distal part to the promontory, some by tackers or screws and some by suture or mixed. The fixation on sacral vertebra 2 is rarely performed although it represents the natural vaginal axis.

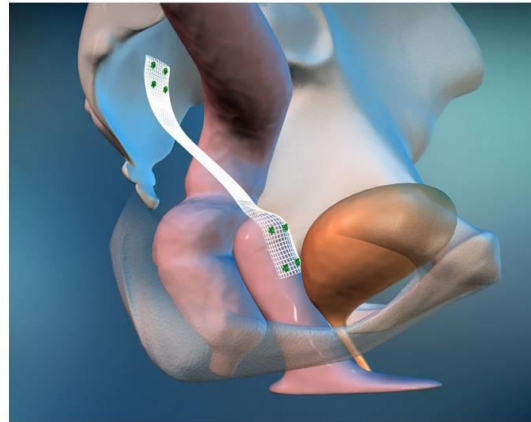
Fixation S2

The following pictures illustrate an approach for the fixation at S2 with running sutures [9]. The proximal part is fixed to the cervix. Alternatively a Y-shaped mesh can be fixed to the vault.

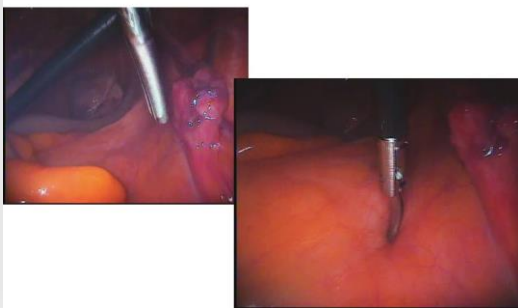
As the longitudinal ligament is very thin tackers cannot be fixed at the level of S2 or will hit the sacral bone. This can cause pain or osteomyelitis.

The dissection starts by identifying the promontory. To avoid harming the hypogastric nerves the first incision should be made in the lateral third of the region (1).

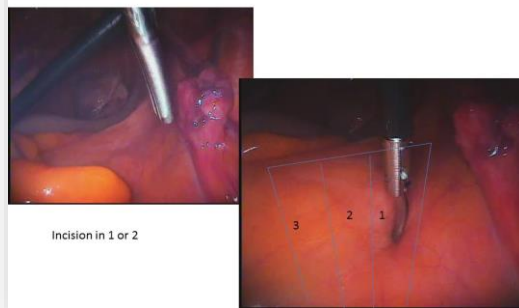
Sacropexy S2 fixation



Identification of the promontory

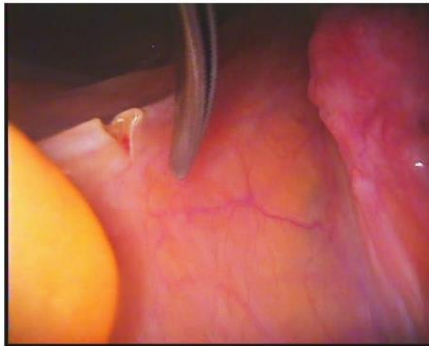


Identification of the promontory



A short incision is made and the gas distends the peritoneum. This enables a superficial opening of the peritoneum and lowers the risk of harming the hypogastric nerves.

Superficial incision

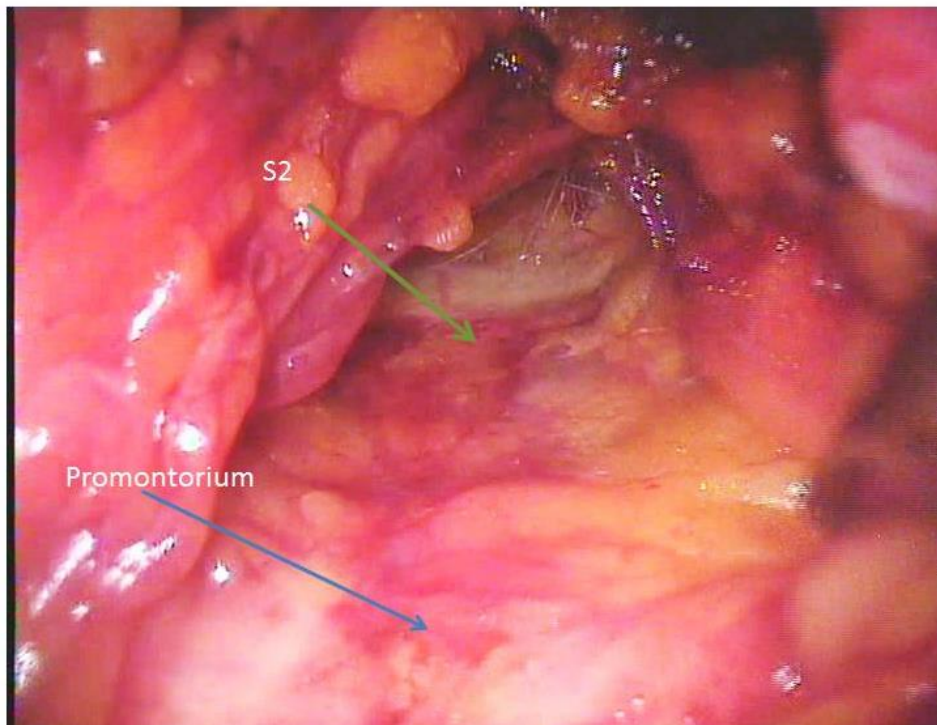


Distention to avoid cutting

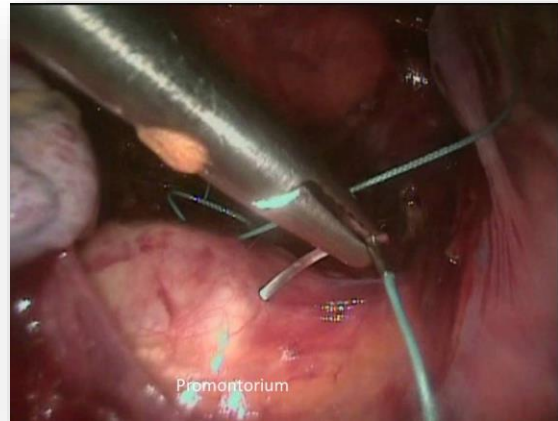
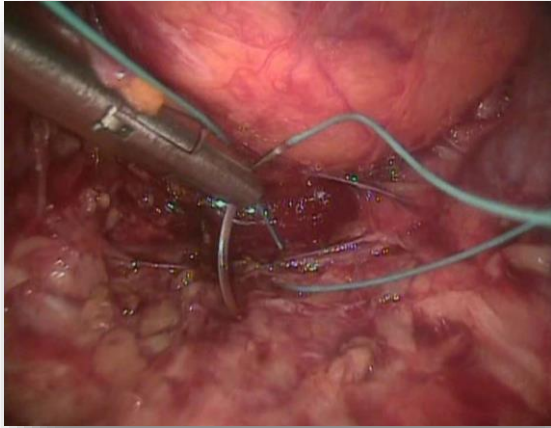


The longitudinal ligament is exposed first over the promontory. The fatty tissue is lifted up to approach the posterior side of the Waldeyer fascia. Crossing vessels have to be dissected very carefully. The management of bleedings in this area is very sophisticated.

Dissection of the longitudinal ligament to reach S2

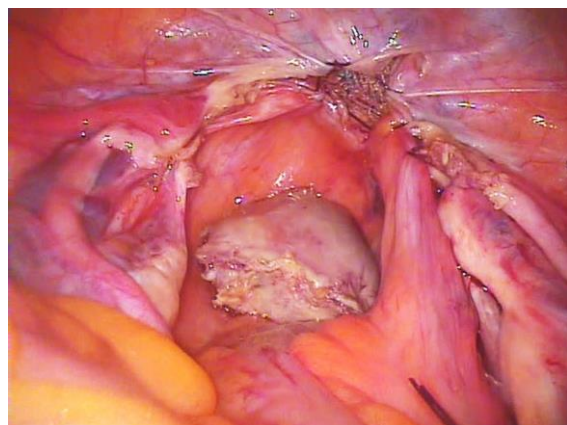
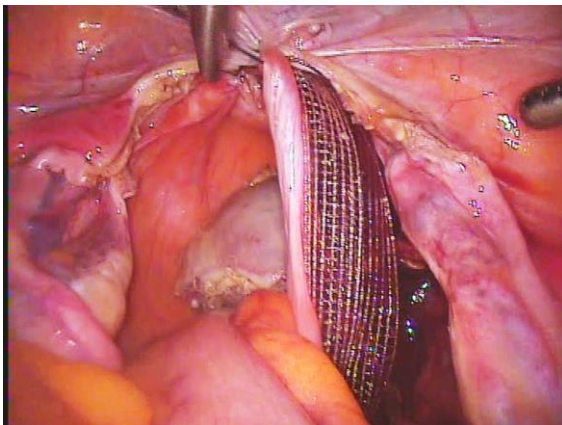
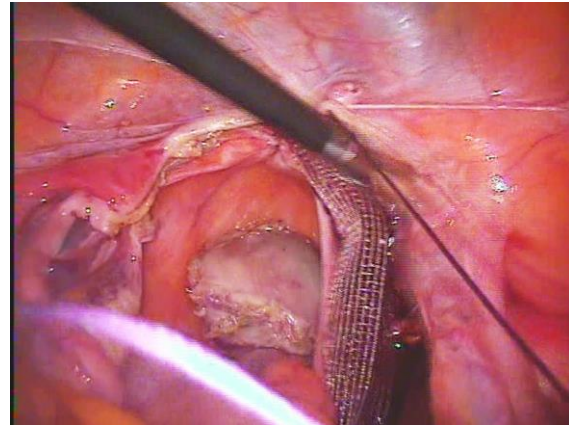
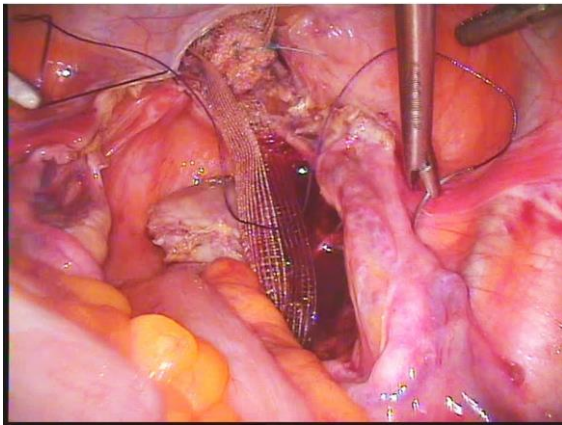
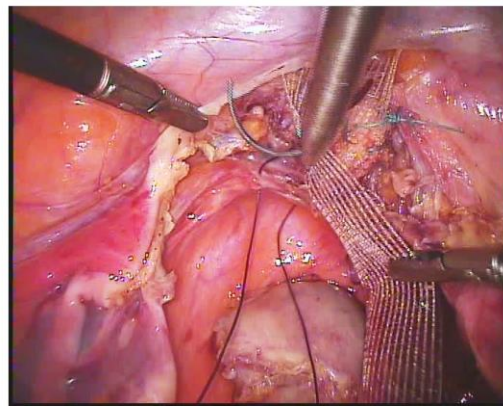
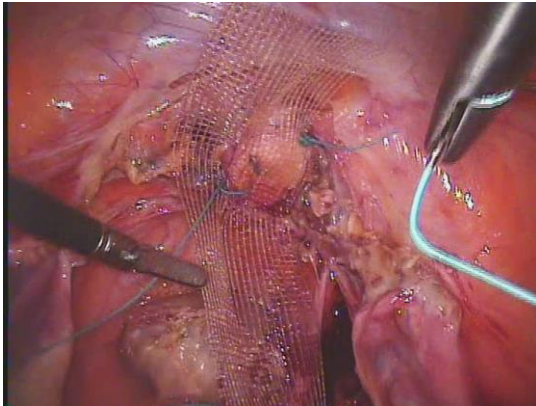


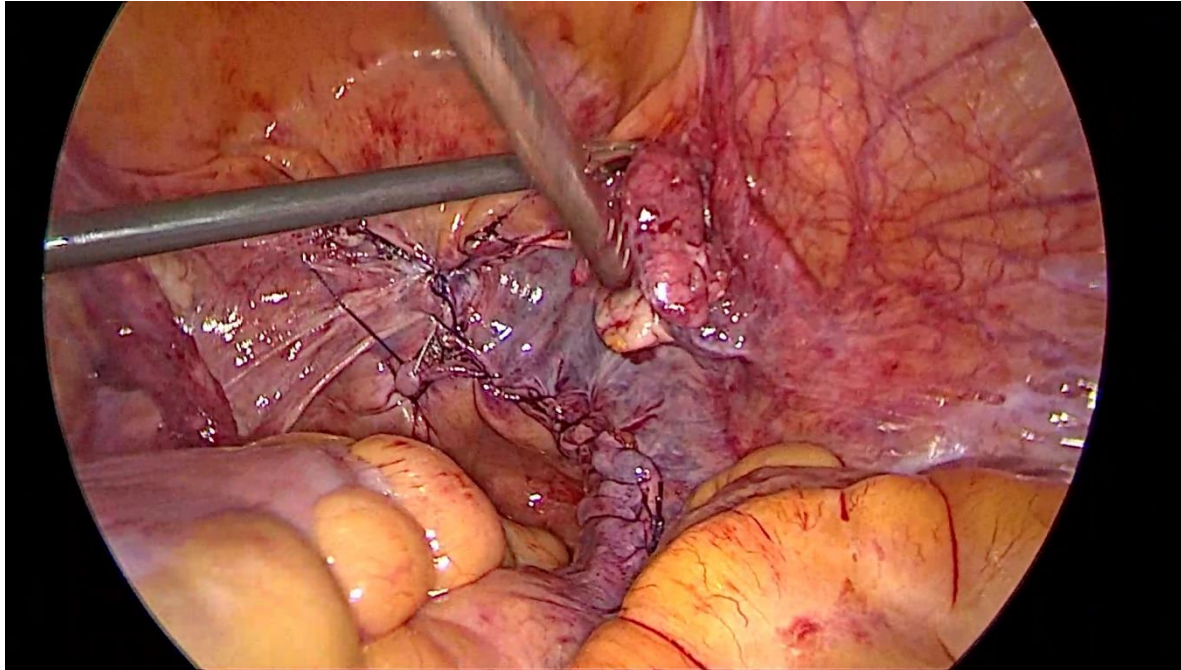
The mesh is armed with two threads. The first stitch of each thread is started on the level of S2. Additionally 2 or more stitches are performed in the direction to the top of the promontory. Finally both threads are knotted over the promontory.



After the fixation on the vagina or the cervical stump the peritoneum is closed with a running suture.

Peritonealising

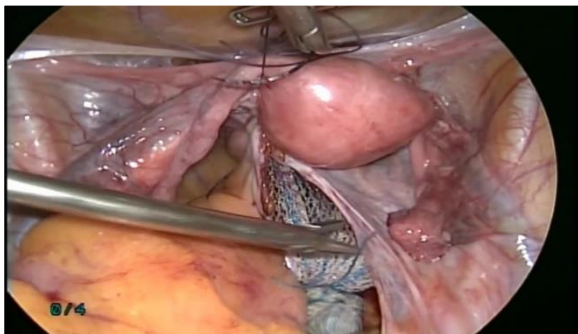
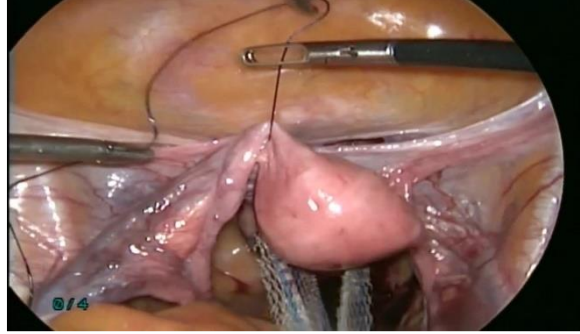
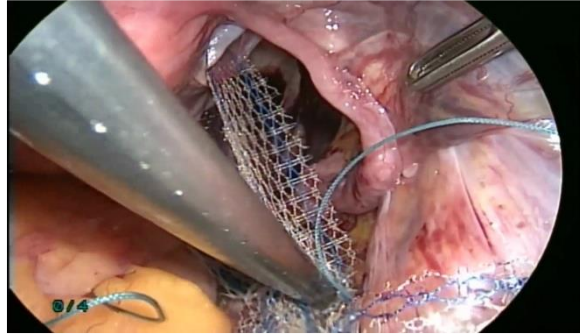


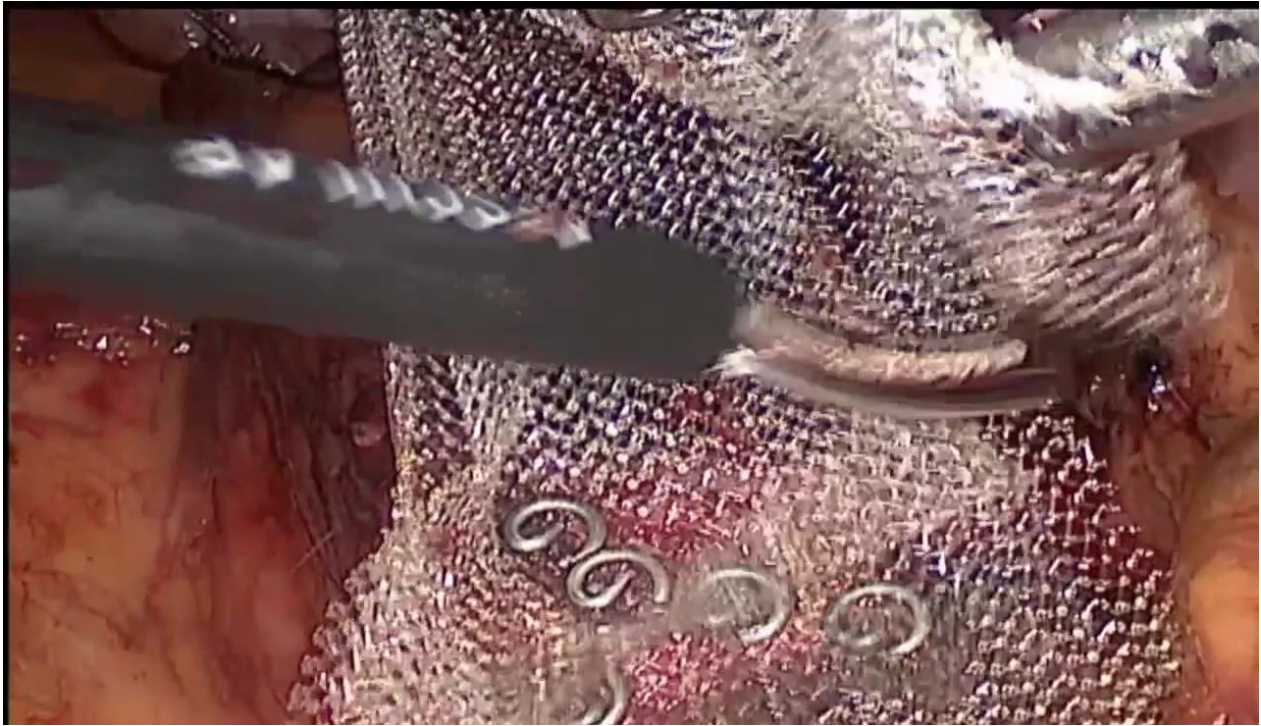


Fixation on the Promontory

As mentioned above the most common approach for the distal fixation is the use of tackers on the promontory. The following pictures show a hysteropexy. A mesh is let around the cervix and fixed to the promontory by PDS tackers.

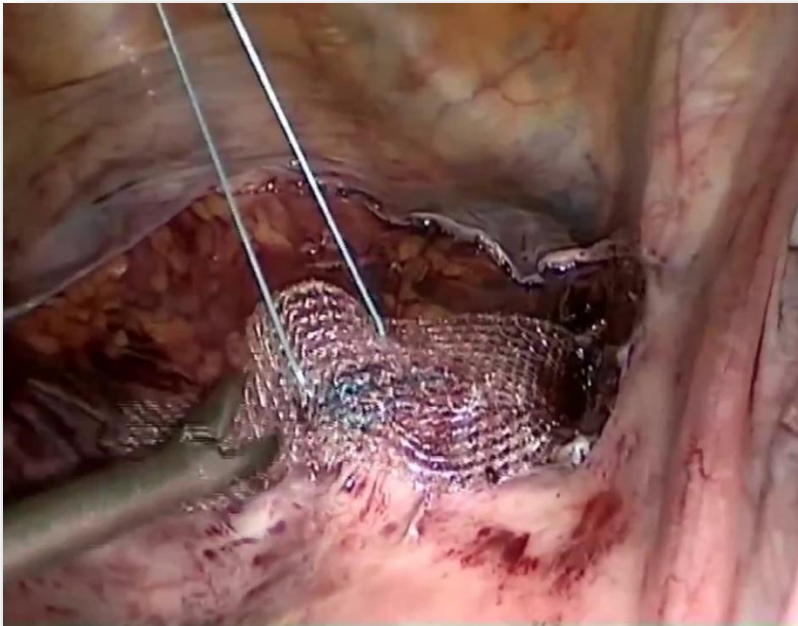
Disadvantage is the narrowing of the pelvic space. This can lead to obstructive bowel problems.



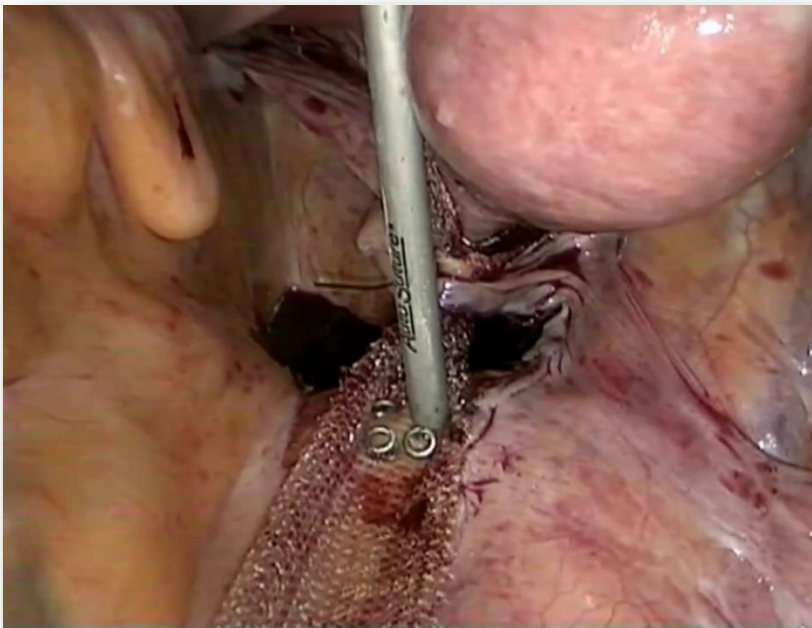


Non absorbable tackers are frequently used but show a higher risk of osteomyelitis.

For hystero-pexy often a necklace technique is used. A premanufactured mesh can be used or a combination of two meshes. The latter is accompanied by dead spaces between the meshes and can lead to a higher infection risk.



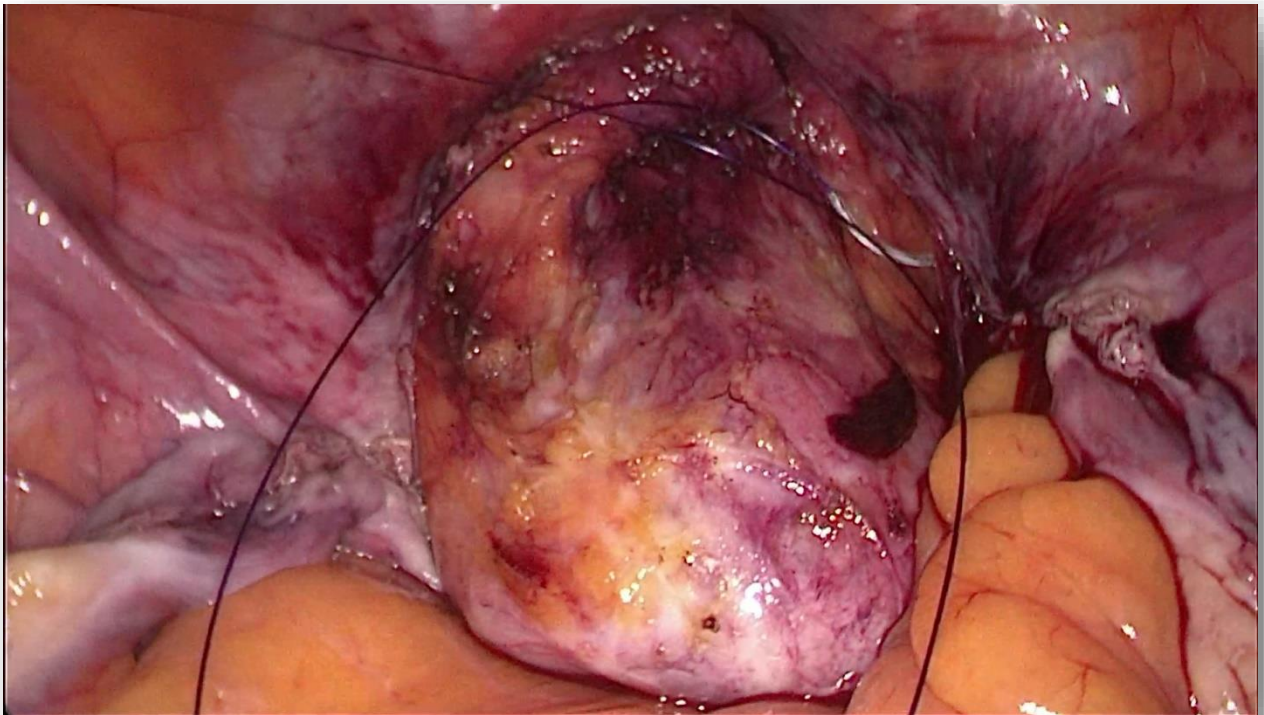
The necklace is sutured at the anterior side of the cervix.



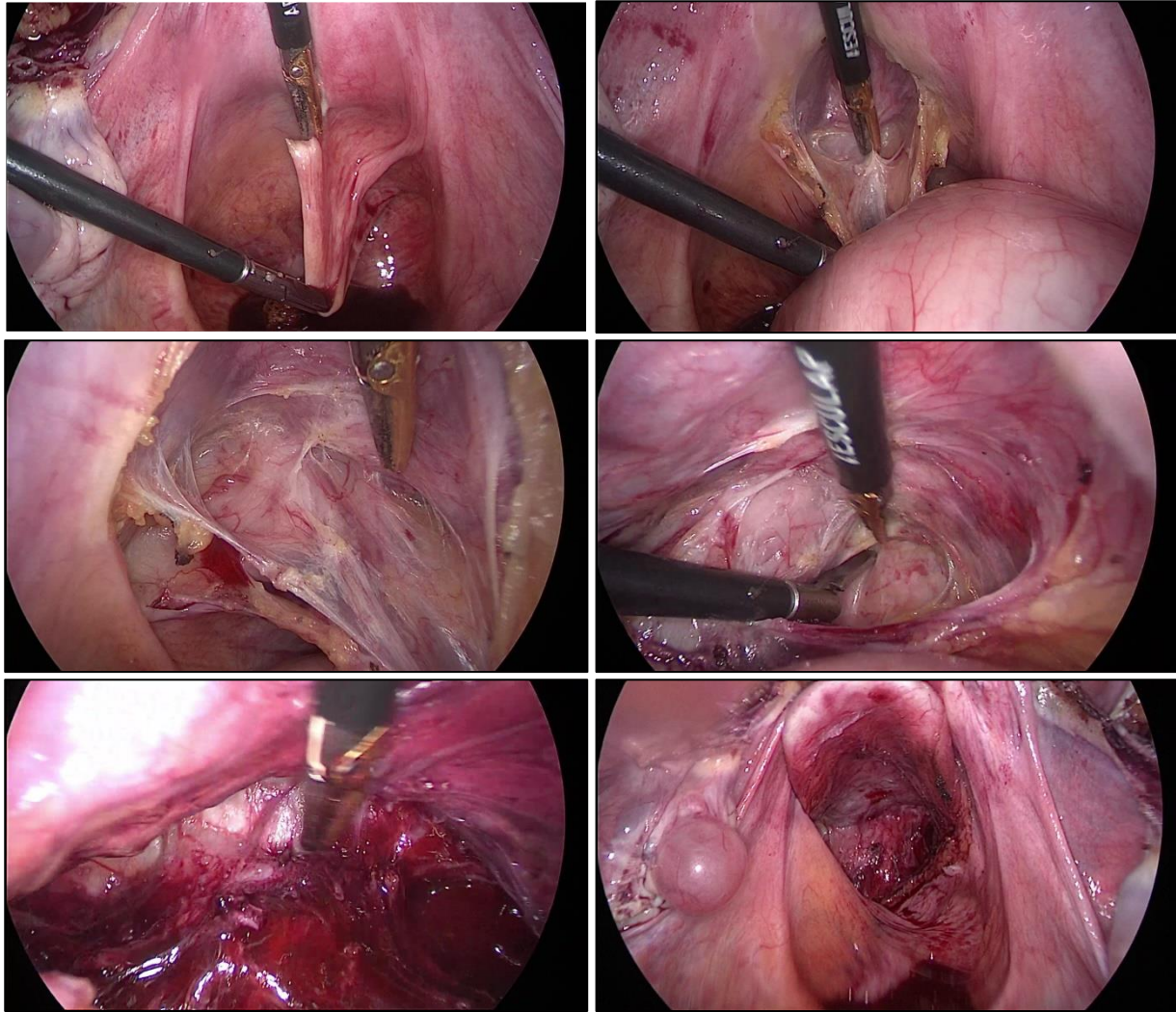
And the distal strip fixed to the promontory.

Fixation with extended Y-mesh

The idea to treat all compartments at once requires applying more mesh. Therefore the vagina is extensively dissected anteriorly and posteriorly.

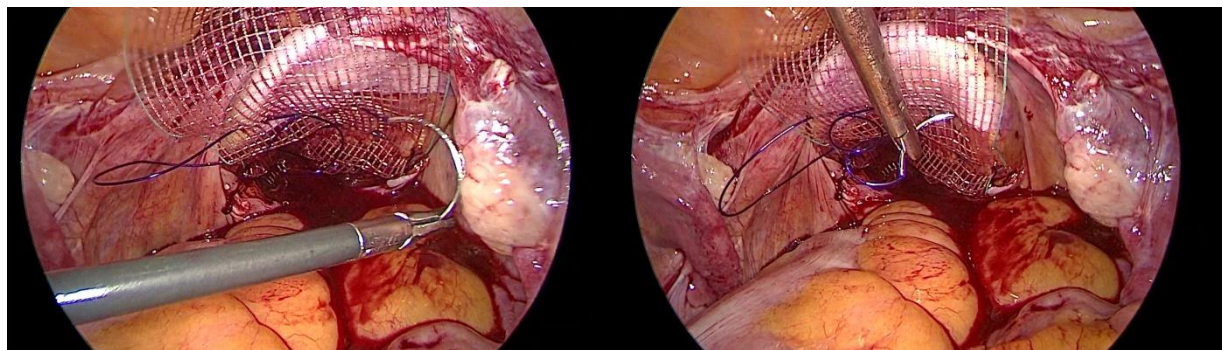


Anterior dissection of the vagina.



The pouch of Douglas is opened and the vaginal wall is approached. Here you can find an a-vascular plane and dissect in the direction of the anus.

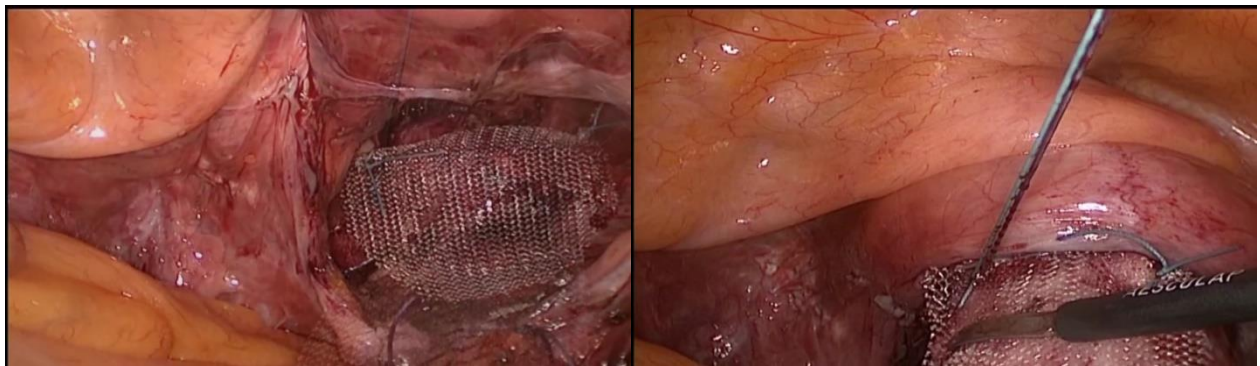
Bilateral the levator muscles are exposed. The aim is to cover the vagina with mesh. Posterior the mesh is usually fixed to the deep part of the levator muscle.



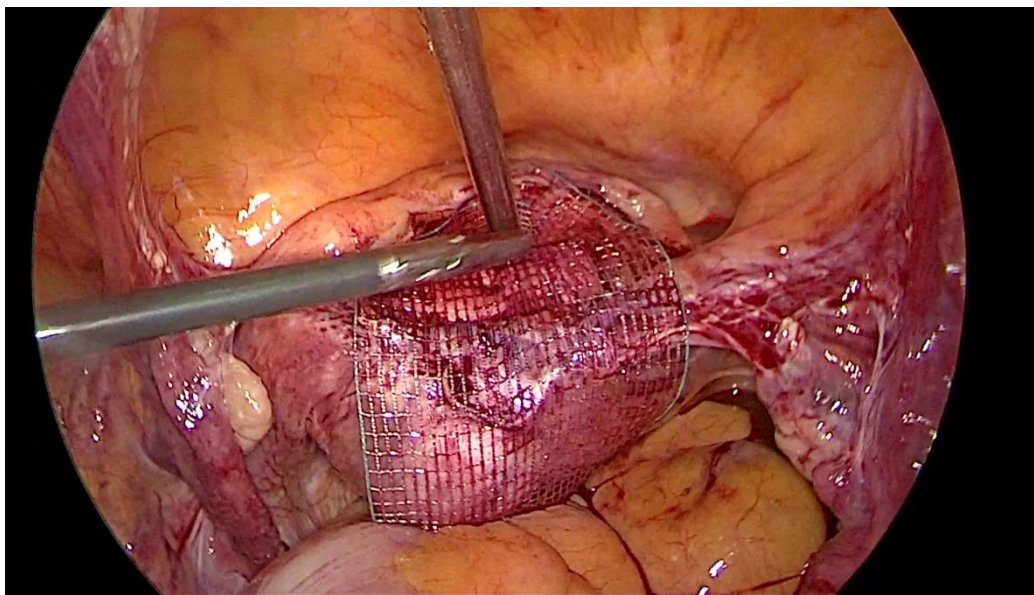
Here by running suture.



Alternatively by glue.



Other surgeons use one mesh posterior, one anterior (here sutured with extra corporal knot tying) and connect it with a third mesh to the promontory.



Here one mesh covers the posterior and the anterior wall.

There are multiple pre-manufactured meshes on the market. The problem is that we can find a lot of data about single studies and outcomes. But at the end we are far away from a standard. The outcome is good and the laparoscopic approach meanwhile the best for the patient.

Conspicuous is the high rate of de novo SUI in many studies. SUI over 10% after the surgery should be avoided. It may be caused by high traction and over correcting the vaginal axis in the direction of the promontory.

We have published 2008 data of 287 patients with de novo incontinence of 6,6%. The fixation was strictly performed at the level of S2.

Author	year	De novo SUI	n	obs. time
Chan, C. M	2013	23,00%	37	2,5
Leruth, J.	2013	23,60%	55	3
Thubert, T.	2013	14,80%	36	
Jama,	2013	46%	155	2
Park,	2012	18,70%		?
Andrea K.,	2012	32%	87	1
Khoshbakht,	2012	7%	31	0,5
Schaer,	2011	24%	98	?
Leveau, E.	2011	24%	91	4
Akladios, C. Y	2010	14,50%	45	1,5
North, C. E.	2009	50%	22	2
Claerhout, F	2009	7%	131	2
Misrai, V.	2008	13%	56	1,8
Banerjee, Noé;	2008	6,60%	287	1,8
Brubaker L	2006	40%	165	?

De novo constipation is a second problem of the sacral colpopexy. One risk is the harming of the hypogastric plexus. This can occur while entering at the promontory or during the preparation of the peritoneum in the direction of the vagina. Therefore some authors suggest the tunneling of the peritoneum. This may decrease the risk but ensures not completely the safety of the nerves.

Another problem is the loss of pelvic inner diameter. Especially in obese patients this can cause obstructive pain and defecations disorders. Alternatively a bi-lateral fixation technique like the NPP Pectopexy can avoid these problems.

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