Appendix 1.

#	Searches
1	vaginal prolapse.mp. or exp Uterine Prolapse/
2	prolapse.mp.
3	urol$.mp.
4	gyn$.mp.
5	3 or 4
6	2 and 5
7	exp rectocele/
8	(rectocele or rectocoele).mp. [mp=ti, ab, ot, nm, hw, ps, rs, ui, tx, kw, ct, sh]
9	exp cystocele/
10	(cystocele or cystocoele).mp. [mp=ti, ab, ot, nm, hw, ps, rs, ui, tx, kw, ct, sh]
11	pelvic floor/su
12	exp Surgical Mesh/
13	exp vagina/ or exp rectum/ or exp bladder/
14	12 and 13
15	or/1,6-11,14

Schimpf MO, Abed H, Sanses T, White AB, Lowenstein L, Ward RM, et al. Graft and Mesh Use in Transvaginal Prolapse Repair: a systematic review. Obstet Gynecol 2016;128.
The authors provided this information as a supplement to their article.

Appendix 2. Studies of the Posterior Vaginal Compartment

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Biologic graft versus no graft										
Paraiso 2006[16] (16), N=106	RCT (A)	Porcine small intestinal submucosa graft (Fortagen) (32)	Posterior colporrhaphy (37) or Site-specific native tissue repair (37)	17.5±7	7/106 (6.60%)	Bp > -2 at 12 mo: Fortagen 12/26 (46%) Native 4/28 (14%) Site-specific 6/27 (22%), p=0.02	PFDI, PFIQ (NS) Global index of improvement (NS)	PISQ-12 (NS) Dyspareunia (NS)	No graft exposures or complications during study period.	Prolapse of any compartment during the study period: Fortagen 3/29 (10%) Native 1/33 (3%) Site-specific 2/37 (5%), NS
Sung 2012[17], N=160	RCT (A)	Porcine subintestinal submucosal graft (67)	Posterior colporrhaphy (70)	12	23/160 (14%)	Ap or Bp ≥ -1 at 12 mo: Graft 8/67 (12%) vs. Native 6/70 (9%), p=0.5 Bulge symptoms: Graft 2/64 (3%) vs. native 4/58 (7%), p=0.4 Defecatory dysfunction symptom composite outcome failure: Graft 28/64 (44%) vs. native 26/58 (45%), p=0.9	PFDI (specific items) (NS)	Postoperative dyspareunia: Graft 7/56 (12.5%) vs native 4/57 (7%), p=0.3	No graft exposures or complications during study period.	One patient in each group returned to OR for incisional problems.
Grimes 2012[18], N=193	Retrospective cohort (C)	Multiple biologic grafts including cadaveric or porcine dermis (69); 57% had graft-only surgery, 43% had some native tissue repair augmented with graft	Posterior colporrhaphy (38%) or site-specific (62%) native tissue repair (124)	35.8	317 patients underwent surgery during time period;193 fit inclusion criteria with ≥12mo follow-up	Bp ≥ -1: Graft 14/69 (20%) vs native 17/124 (14%), NS	PFDI (specific items) (NS) Satisfaction (NS)	Dyspareunia and bother (NS)	Graft 1/69 (1%) vs native 0/124	Prolapse overall: Graft 10/69 (15%) vs native 4/124 (3%), p=0.01 Posterior prolapse: Graft 2/69 (3%) vs native 1/124 (1%), NS
Synthetic non-absorbable mesh versus no graft										

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Musaev 2009[19], N=163	Prospective Cohort (C)	Self-tailored polypropylene mesh placed via transperineal incision to puborectalis muscles (22)	Transvaginal levatoroplasty (68) Transperineal levatoroplasty (73)	12-13 mo	Not Reported	Anatomic failure (definition not reported): Mesh 5%, Transvaginal levatoroplasty 27.3% Transperineal levatoroplasty 9%, p NR	Constipation (NS) Levator spasm 90% in levatoroplasty group (both transvaginal and transperineal)	Improved 45% in mesh group, instrument not stated; 40-50% had dyspareunia in both levatorplasty groups	Not reported	Not reported

Appendix 3. Studies of the Anterior Vaginal Compartment

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Biologic graft versus no graft										
Gandhi 2005[20], N=154	RCT (C)	Cadaveric fascia lata (Tutoplast) (76)	Anterior colporrhaphy (78)	Median 13	1/154 (1%)	POP-Q Stage ≥ 2: Graft 16/76 (21%) vs. Native 23/78 (29%), p=0.23	Bulge, pain, slow urine stream symptoms, NS	Not reported	Not reported	None reported
Chaliha 2006[21], N=28	Retrospective Cohort (C)	Porcine small intestine submucosa (14)	Anterior colporrhaphy (14)	24	Not reported	Mean Ba on POP-Q, NS	P-QOL (NS)	Not reported	No erosions noted	None reported
Handel 2007[22], N=119	Retrospective cohort (C)	Porcine dermis anchored to pelvic sidewalls (Pelvicol) (56)	Anterior colporrhaphy (18)	13.5	20/119 (17%)	Grade ≥ 2 cystocele BW: Graft 20/56 (36%) vs. Native 1/18 (6%), p NR	Not reported	Not reported	Extrusion: 12/56 (21%) graft patients	Extrusion: 2 patients in graft group required removal
Guerette 2009[23], N=94	RCT (B)	Bovine pericardium collagen matrix (Veritas) (47)	Anterior colporrhaphy (47)	24	22/94 (23%) at 12 mo 35/94 (37%) at 24mo	POP-Q Ba > -1 at 12 mo: Graft 5/35 (14%) vs. Native 8/37 (22%), p=0.54 at 24mo: Graft 4/17 (24%) vs. Native 10/27 (37%), p=0.51	UDI (NS)	PISQ-12 (NS) Dyspareunia at 12mo: Graft 3/20 (15%) vs. Native 3/16 (20%), p NS	Vaginal epithelial healing abnormalities, all treated in office: Graft 9/47 vs. Native 13/47, NS No erosions/exposures.	None reported
Feldner 2010[24] and 2012[25], N=56	RCT (A)	Porcine small intestine submucosa (SIS) (29)	Anterior colporrhaphy (27)	12	0/56 (0%)	POP-Q stage ≥ 2 based on Ba: Graft 4/29 (13.8%) vs. Native 11/27 (40.7%), p=0.03	P-QOL (NS)	Dyspareunia at 12mo: Graft 5/29 (17.2%) vs. Native 4/27 (14.8%), NS FSFI (NS)	No erosions noted	None

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Hviid 2010[26], N=61	RCT (B)	Porcine dermis (Pelvicol) (30)	Anterior colporrhaphy (31)	12	7/61 (11.5%)	POP-Q Ba ≥ -1: Graft 2/28 (7%) vs. Native 4/26 (15%), NS	KHQ (NS) Subjective failure of bulge symptoms: 1 in each group (3%), NS	Not reported	One graft exposure treated in office	Recurrence: 2 native and 3 graft patients underwent prolapse reoperation Incontinence: 1 patient in each group underwent sling surgery
Menefee 2011[27], N=99 in three arms	RCT (A)	Paravaginal repair augmented with self-tailored porcine dermis attached to arcus bilaterally (31)	Anterior colporrhaphy (32)	24	21/99 (21%)	POP-Q stage ≥ 2 (Ba of -1 or greater): Native 14/24 (58%) vs. graft 12/26 (46%), p=NS Composite failure: Complaint of a bulge on POP-DI and stage ≥2 prolapse: Native 3/24 (13%) vs. Graft 3/26 (12%), p= NS	PFDI, PFIQ (NS)	PISQ-12 (NS) de novo dyspareunia: 3/24 native group vs. 2/26 in graft group	Graft group 4%, healed with estrogen therapy	Recurrence: 2 patients in graft group, 0 in native group
Meschia 2007[28], N=206	RCT (C)	Porcine dermis (Pelvicol) (100)	Anterior colporrhaphy (106)	12	5/206 (2%)	POP-Q Ba ≥ -1: Graft 7/98 (7%) vs. Native 20/103 (19%), p=0.02	VAS for satisfaction (NS) Prolapse, incontinence symptoms (NS)	Dyspareunia: Graft 7/47 (15%) vs. native 5/48 (10%), p NS	Exposure: 1/98, graft removed	Erosion: 1 patient in graft group had implant removed

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Robert 2014[29], N=57	RCT (A)	Small-intestine submucosa graft (SIS) (28)	Anterior colporrhaphy and modified vaginal paravaginal repair with permanent sutures (29)	12	1/28 mesh group (1.75%)	POPQ stage 2 (Ba ≥ -1): 12/27 (44%) mesh, 11/28 (39%) native, NS	No difference on PFDI, PFIQ (NS); satisfaction high in both groups, no p given. Pain reported by 4 mesh patients, 3 native patients.	PISQ-12 no difference, change in sexual activity status not different between groups at 12mo (NS)	Not reported	Mesh group: 1/28 for urinary retention, 1/28 for ongoing pelvic pain (2 surgeries); 1/29 in the native group returned for release of midurethral sling
Synthetic absorbable mesh versus no graft										
Weber 2001[30], N=109	RCT (B)	Polyglactin 910 (Vicryl) (34)	Traditional (35) or ultralateral anterior colporrhaphy (35)	Median 23.3	26/109 (24%)	POP-Q Stage ≥ 2: Traditional 23/33 (70%) vs ultralateral 13/24 (54%) vs mesh 15/26 (58%), NS	Urinary symptoms, prolapse severity, NS	Dyspareunia, NS	1/34 patients in mesh group, treated in office	None reported

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Madhuvrata 2011[31], N=66	RCT (B)	Polyglactin 910 (Vicryl) (35)	Anterior colporrhaphy (33)	24	12/66 (18%)	Not reported	POP-SS, NS No residual prolapse symptoms: 6/25 (24%) mesh vs 8/29 (28%) native, p=0.28 VAS for QOL and satisfaction scores, NS 5/51 (10%) had pain not related to intercourse, groups not specified ICI-UI - urinary and bowel symptoms, no difference	Dyspareunia, NS	6/66 patients required suture removal (mesh vs native group not specified) and 2/32 patients required removal of some mesh	Bleeding: 1 patient returned to OR for bleeding, group not specified Prolapse recurrence: 2 patients from native group underwent repeat anterior repair, 2 mesh and 1 native repair patient underwent posterior repair Rectal prolapse: 1 patient in native group Pessary placement: 3 mesh patients
Synthetic non-absorbable mesh versus no graft										
Julian 1996[32], N=24	Prospective cohort (C)	Self-tailored polypropylene mesh (Marlex) (12)	Anterior colporrhaphy (12)	24	0/24 (0%)	<u>BW grade 2 or greater:</u> Mesh 0/12 (0%) vs. native 4/12 (33%), p<0.05	Not reported	Not reported	3/12 patients had mesh erosions, all treated in office	None reported
Bai 2007[33], N=100 (Additional 38 patients underwent laparotomy for repair and are not discussed here)	Prospective cohort (C)	Self-tailored polypropylene mesh fixed to arcus at 4 points (28)	Anterior colporrhaphy (72)	12	0/138 (0%)	<u>POP-Q Stage ≥ 2 at anterior wall:</u> Mesh 0/28 (0%) vs. native 1/72 (1.4%), NS	Not reported	Not reported	Erosion: 1/72 (1.4%) native vs 1/28 (3.6%) mesh, NS	None reported

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Handel 2007[22], N=119	Retrospective cohort (C)	Polypropylene mesh anchored to pelvic sidewalls (25)	Anterior colporrhaphy (18)	13.5	20/119 (17%)	Grade ≥ 2 cystocele BW: Graft 20/56 (36%) vs. Mesh 1/25 (4%), p NR	Not reported	Not reported	Extrusion: 1/25 (4%) mesh group	None reported
Nieminen 2008[35] and 2010[36]; Hiltunen 2007[34], N=202	RCT (A)	Self-tailored 4-arm monofilament polypropylene mesh (Parietene light) (104)	Anterior colporrhaphy (97)	36	22/202 (11%)	POP-Q Stage ≥ 2 based on Aa or Ba: Mesh 14/105 (13%) vs. native 40/97 (41%), p<0.0001 All types of recurrence: Mesh 30/105 (29%) vs. native 49/97 (51%), p=0.002 Bulge symptoms: Mesh 10% vs. native 19%, p=0.07	Symptomatic recurrence, NS Urinary incontinence, NS	Sexual activity rate and function scores, NS	Exposure 20/104 (19%), 14 required mucosal closure or partial resection	Postop bleeding: 1/104 mesh patients returned to OR, p NS Reoperation rate overall, NS Anterior wall reoperation: 9/96 native, 0/104 mesh Erosion: 8/104 mesh
Nguyen 2008[37], N=76	RCT (A)	Polypropylene mesh inserted using trocar-based kit (Perigee) (37)	Anterior colporrhaphy (38)	12	1/75 (1.3%)	POP-Q Stage ≥ 2 based on Aa or Ba: Mesh 5/38 (13%) vs. native 17/38 (45%), p=0.002	POPDI, UDI better in mesh group (p=0.01) CRADI better in native group (p=0.04) PFDI overall and PFIQ, NS	PISQ-12, NS De novo dyspareunia 4/26 (16%) native vs. 2/23 (9%) mesh, NS	Extrusion: 2/37 (5%), treated in office	Recurrence: 1/38 in native group

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Sivaslioglu 2008[38], N=90	RCT (B)	Self-tailored 4-arm monofilament polypropylene mesh (Parietene light) (45)	Anterior +/- paravaginal repair (45)	12	5/90 (6%)	POP-Q Stage ≥ 2: Mesh 4/43 (9%) vs. native 12/42 (28%), p=0.004	P-QOL (validated in Turkish) improved in both groups, between groups NR	De novo dyspareunia: 2/43 (4.6%) mesh vs 0% native, p NR	Erosion: 3/45 (7%), all revised under local anesthesia	None reported
Ignjatovic 2010[39], N=76	Retrospective cohort (C)	Polypropylene mesh inserted using trocar-based kit (Anterior Prolift) (37)	Anterior colporrhaphy (39)	12	4/80 (5%)	POP-Q Stage ≥ 2 based on Ba: Mesh 4/37 (11%) vs. native 20/39 (52%), p=0.0004 Bulge symptoms: Native 6/39 (15%) vs. mesh 2/37 (5%), p<0.001	P-QOL, NS Continence rate, NS	FSFI mean score: 29 native (n=22) vs 27 mesh (n=21), p NR	Erosion: 4/37 (10.8%) mesh patients	"Additional surgery": 13 cases mesh vs 5 in native group, p=0.04
Altman 2011[40], N=389	RCT (A)	Polypropylene mesh inserted using trocar-based kit (Anterior Prolift) (200)	Anterior colporrhaphy (189)	12	21/389 (5.4%)	Composite outcome: bulge symptoms and POP-Q stage ≥2: Mesh 69/176 (39.2%) vs. native 114/174 (65.5%), p<0.001	UDI summary score, NS UDI SUI score favored native repair, p=0.02 UDI Obstructive score favored mesh repair, p=0.01 Pain at any time point, NS	PISQ, NS	Mesh revision: 6/200 (3%) mesh vs 0/189 native, p=0.03	SUI: 5/186 (2.7%) mesh vs 0/189 native, NS Prolapse recurrence: 1/189 (0.5%) native vs 0/200 mesh, NS Mesh revision: 6/200 (3%) mesh vs 0/189 native, p=0.03 Reoperation during initial hospitalization: 2/200 (1%) mesh vs. 0/189 native, NS

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Menefee 2011[27], N=99 in three arms	RCT (A)	Paravaginal repair augmented with self-tailored polypropylene mesh attached to arcus bilaterally (28)	Anterior colporrhaphy (32)	24	21/99 (21%)	POP-Q stage ≥ 2 (Ba of -1 or greater): Native 14/24 (58%) vs. mesh 5/28 (18%), p=0.004 Composite failure: Complaint of a bulge on POP-DI and stage ≥2 prolapse: Native 3/24 (13%) vs. Mesh 1/32 (4%), p=NS	PFDI, PFIQ (NS)	PISQ-12 (NS) de novo dyspareunia: 3/24 native group vs. 2/28 in mesh group	Mesh group 14%, 2 patients required reoperation	Erosion: 2 patients in mesh group required revision Recurrence: 0 patients in either group
Lau 2011[41], N=115	Retrospective cohort (C)	Polypropylene mesh inserted using trocar-based kit (Perigee) (68)	Anterior colporrhaphy (47)	Median 14	2/115, 1.7%	POP-Q Stage ≥ 2: Mesh 1.5% vs. native 13%, p=0.02	Postoperative pain, NS Urinary frequency more improved in mesh group, p=0.03 SUI, NS	Not reported	Prolapse mesh erosion: 2/68 mesh vs. 0/47 native	Recurrence: 4/47 in native group

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Vollebregt 2011[42], N=125	RCT (B)	Polypropylene mesh inserted using trocar-based kit (Avaulta) (59)	Anterior colporrhaphy (62)	12	18/125 (14.4%)	POP-Q Stage ≥ 2: Mesh 9% vs. native 59%, p=0.02 Bulge symptoms: Feeling a bulge noted by 9% of each group at 12mo (NS) Seeing a bulge reported by 11% mesh vs 7% native (NS)	UDI, IIQ, NS	de novo dyspareunia: 3/20 (15%) mesh vs 2/21 (9%) native, p=0.7 Pre-existing dyspareunia resolved significantly more after native repair.	Exposure: 2/59 (4%), 1 required surgical revision	Overall: 6/59 mesh vs. 4/62 native, NS Recurrence: 3/62 (5%) in native group underwent anterior repair; 2 mesh and 1 native patient underwent posterior repair; 1 mesh patient underwent colpopexy; 1 native patient used pessary Erosion: 1/59 (2%) in mesh group
El-Nazer 2012[43], N=44	RCT (B)	Self-tailored polypropylene mesh (Gynemesh PS) (21)	Anterior colporrhaphy (23)	24	4/44 (9%)	POP-Q stage ≥ 2: Mesh 1/20 (5%) vs. native 6/20 (30%), p<0.05	POP-QoL: Voiding difficulty and vaginal bulge symptoms improved more with mesh (p<0.05)	Sexual activity rate and dyspareunia, NS	1/20 (5%) in mesh group	None reported
Turgal 2013 [44], N=40	Prospective cohort (B)	Monofilament macroporous polypropylene mesh placed using trocars (Sofradim) (20)	Anterior colporrhaphy (20)	12	0/40 (0%)	POP-Q stage ≥ 2 (leading edge ≥ -1): Native 5/20 (25%) vs. mesh 1/20 (5%), p=0.04	Bulging symptoms: native 25% vs mesh 5%, p = 0.04 OAB, bladder emptying, pain, UI, NS	Not reported	3/20 (15%), all underwent surgical revision, 2 cured, one persistent at 12 mo	Mesh erosion: 3/20 in mesh group

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Delroy 2013 [45], N=79	RCT (A)	Nazca TC (type 1 macroporous monofilament polypropylene mesh) (40)	Anterior colporrhaphy (39)	12	0/79	POPQ stage 2 (Ba ≥ -1) 7/40 (17.5%) mesh, 17/39 (43.6%) native, p=0.02	PQOL: No difference between groups, p>0.05	Dyspareunia: 2/21 (10%) sexually active women in mesh, 4/19 (21%) sexually active women in native	2/40 (5%) in mesh group all treated in office, 0/39 (0%) in native group	10/39 patients in native group underwent subsequent prolapse repair, 8 with mesh and 2 with native repair
deTayrac 2013[62], N=162	RCT (A)	Monofilament polypropylene mesh, Ugytex (72)	Anterior colporrhaphy (75)	17 (native) 16 (mesh)	29/162, (17.9%)	POPQ stage 2 (Ba ≥ -1) 7/66 (11%) mesh, 24/67 (36%) native, p=0.0006 Composite outcome including bulge symptoms: Failure in 31% mesh vs 52% native, p=0.007	PFDI, PFIQ - no difference (NS) except colorectal impact on emotional scale better in traditional colporrhaphy (p=0.04). Satisfaction high in both groups, p not given. Pain felt once during exam: 15% native group, 28% mesh group (p=0.06). More pain 6 weeks after surgery: 27% mesh, 14% native, p=0.05. Pain felt once: no difference. Pain on exam at 12mo: no difference.	PISQ-12 no difference (NS); de novo dyspareunia 1/14 native, 3/13 mesh, p=0.75. Postop dyspareunia in sexually active women: 5/24 (20.8%) native vs 6/22 (27.3%) mesh, p=0.75.	7/75 (9.5%), 4 required return to OR	Any reoperation 10/72 (13.9%) native, 8/75 (10.7%) mesh, p=0.55. De novo SUI 7/72 (11%) native, 8/75 (12%) mesh, p=0.83.

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Tamanini 2013[46] and Tamanini 2013[47], N=100	RCT (A)	NAZCA TC kit made of macroporous, monofilament polypropylene with four arms passed transobturator and near ischial spines (45)	Anterior colporrhaphy (55)	12	2/45 (4.4%) in the mesh and 1/55 (1.8%) in the native group	Stage 2 POPQ (Ba > -2): 7/43 (16.3%) in mesh vs 24/53 (44.5%) in native repair, p=0.006	ICIQ – VS, ICIQ-UI SF and OAB-V8, no difference in vaginal symptoms and LUTS	Not computed due to low sexual activity in both groups	4/45 (9.3%) in mesh group	Not specifically reported, 3 mesh and 2 native cases required "readjustment of suburethral mesh"; 1 mesh revision done but not specified where done; 1 mesh pt and 2 native pts underwent sling placement for SUI
Rudnicki 2014[48], N=161	RCT (A)	Porcine collagen-coated monofilament polypropylene mesh (Avaulta Plus) (79)	Anterior colporrhaphy (82)	12	7/161 (4.3%)	POP-Q stage ≥ 2: 9/76 (11.8%) mesh, 47/78 (60.3%) native, p<0.001	PFDI, PFIQ - no difference (NS) except POPDI, 10.7±14.5 mesh vs 16.0±17.2, p=0.044; new urinary incontinence: 5/76 mesh, 1/78 native, NS	PISQ-12 (NS); De novo dyspareunia: 2/76 (2.7%) mesh, 0/78 native	Erosions in 10/76 (13.3%) mesh	3 surgeries for mesh erosion, 2 mesh removals for infection.
Gupta 2014[49], N=106	RCT (B)	Macroporous, monofilament, vicryl-polypropylene mesh with four self-tailored arms (52)	Anterior colporrhaphy (54)	12	21/106 (19.8%)	Anterior wall ≥ -1 (stage 2): 2/54 (3.7)% native vs 0/52 mesh, p NR	Satisfaction: 50/54 (92.5%) native vs 48/52 (92%) mesh (no p value given) Mean blood loss (ml): 398±129 mesh vs 188±97 native, p=0.015	Not reported	4/52 (7.6%) in mesh group, 2 patients underwent excision, not specified where this was done.	2 patients underwent mesh excision, not specified where this was done.

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Lamblin 2014[50], N=68	RCT (A)	Polypropylene mesh inserted using trocar-based kit (Perigee) (33)	Anterior colporrhaphy & vaginal colposuspension with permanent suture (35)	12 & 24	1/68 (1.5%) @ 12mo 5/68 (7.4%) @ 24mo no difference between groups	POPQ stage ≥ 2: Mesh 0/33 (0%) vs. native 4/34 (11.8%), p=0.11 @ 12 mo Mesh 0/31 (0%) vs. native 5/32 (15.6%), p=0.05 @ 24 mo PFDI question 3 (symptoms of bulge) @ 24mo: answered yes by 6% of both groups, p=0.65	PFDI, PFIQ, NS	VAS, NS Both groups showed improvement. de novo dyspareunia: 1 patient in each group.	Erosion: 0/35 native vs. 2/33 (6%) mesh, 1 patient required mesh resection	SUI: 4/33 mesh patients and 3/34 native underwent midurethral slings Pain: 1 mesh patient underwent additional prolapse procedures for dyspareunia, 6 mesh patients underwent repairs for dyschezia Mesh: Partial excision in 1 mesh patient
Wong 2014[51], n=183	Retrospective cohort (C)	Macroporous, monofilament, polypropylene mesh inserted using a trocar-based kit (either Perigee, n= 51, or Prolift, n=49) (100)	Anterior colporrhaphy (83)	4.47 yrs for native group, 3.45 yrs for mesh group, p<0.001	0/183	POP-Q stage ≥ 2: 33/100 (33%) mesh, 46/83 (55%) native, p=0.002	Satisfaction: 54/83 (65%) native vs 82/100 (82%) mesh (p=0.04) Recurrent prolapse symptoms: 24/83 (29%) native vs 20/100 (20%) mesh (p=0.25)	Not reported	Not reported	Not reported
Multiple types of grafts versus no graft										

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Reid 2011[52], N=108	Retrospective cohort (C)	Vaginal paravaginal repairs augmented with macroporous monofilament polypropylene mesh (Gynemesh n=15 or Marlex n=4), or porcine small intestine submucosa crosslinked collagen matrix (Surgisis ES, n=89)	Vaginal-paravaginal repair (59)	23 (graft/mesh) 55 (native)	None reported	BW grade ≥2: Mesh 3/19 (16%) vs. graft 7/89 (8%) vs. native 18/59 (31%), p=0.004	Bulge symptoms: Mesh/graft 6/92 (6.5%) vs. Native 10/52 (19.2%), p=0.02 SUI and OAB rates, NS	de novo dyspareunia: 6 mesh/graft and 2 native patients, P NR	2/4 Marlex, 1/15 Gynemesh and 0/89 Surgisis	Mesh problems: 3/19 mesh patients underwent removal
Graft/mesh versus other types of graft/mesh										
Leboeuf 2004[53], N=45	Prospective cohort (C)	Modified "four-defect repair" using porcine dermis graft (Pelvicol) (19)	"Four-defect repair" with polyglactin mesh (Vicryl) (24)	15	2/45 (4.4%)	BW grade ≥ 2: Pelvicol 3/19 (15.8%) vs. Vicryl 0/24 (0%), p NR	SEAPI score improved in both, between-group p NR	Not reported	None noted	None reported
Handel 2007[22], N=119	Retrospective cohort (C)	Porcine dermis anchored to pelvic sidewalls (Pelvicol) (56)	Polypropylene mesh anchored to pelvic sidewalls (25)	13.5	20/119 (17%)	Grade ≥ 2 cystocele BW: Graft 20/56 (36%) vs. Mesh 1/25 (4%), p NR	Not reported	Not reported	Extrusion: 12/56 (21%) graft vs. 1/25 (4%) mesh	Extrusion: 2 patients in graft group required removal

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Natale 2009[54], N=190	RCT (B)	Self-tailored polypropylene mesh (Gynemesh) (96)	Self-tailored porcine dermis graft (Pelvicol) (94)	24	0/190 (0%)	POP-Q point Ba ≥-1: Mesh 27/96 (28%) vs. graft 41/94 (44%), p=0.06	All urinary symptoms improved in both groups, no between-group p values reported P-QOL: Graft group better for domains of social limitations (p=0.04) and emotions (p=0.02), all others NS	PISQ improved with graft vs. mesh, p=0.03	Erosion: Mesh 6/96 (6.3%) vs graft 0/94 (0%), p=0.02; all treated with revision/resuturing	None reported
Novi 2009[55], N=117	Retrospective cohort (C)	Porcine dermis graft (Pelvicol) (72)	Cadaveric dermis graft (Alloderm) (45)	21 (Pelvicol) 25 (Alloderm)	7/117 (6%)	BW anterior vaginal wall stage ≥ 2: Pelvicol 8/72 (11%) vs. Alloderm 21/45 (47%), RR 0.45 (95% CI, 0.1-0.8)	Functional status, NS	Satisfactory sexual activity: 58% Alloderm vs. 63% Pelvicol, p<0.05 Dyspareunia rate, NS	No graft erosions in either group Suture erosions in 2/45 Alloderm and 4/72 Pelvicol, all removed in office	None reported

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Menefee 2011[27], N=99 in three arms	RCT (A)	Paravaginal repair augmented with self-tailored polypropylene mesh attached to arcus bilaterally (28)	Paravaginal repair augmented with self-tailored porcine dermis attached to arcus bilaterally (31)	24	21/99 (21%)	POP-Q stage ≥ 2 (Ba of -1 or greater): Graft 12/26 (46%) vs. mesh 5/28 (18%), p=0.015 Composite failure: Complaint of a bulge on POP-DI and stage ≥2 prolapse: Graft 3/26 (12%) vs. mesh 1/32 (4%), p=NS	PFDI, PFIQ (NS)	PISQ-12 (NS) de novo dyspareunia: 2/26 graft group vs. 2/28 mesh group	Mesh group 14% vs. graft group 4%, p NS; 2 mesh patients required reoperation, 3 mesh and 1 graft patient healed with estrogen cream	Erosion: 2 patients in mesh group required revision Recurrence: 2 patients in graft group, 0 in mesh group
Yuk 2012[56], N=87	RCT (C)	Anterior polypropylene mesh placed using trocar-based kit (4-point insertion, seraSIS Atom) (45)	Anterior polypropylene mesh placed using trocar-based kit (2-point insertion, seraSIS Atom) (42)	12	8/87 (9.1%)	POP-Q stage ≥ 2: 4-point: 0/40 (0%) vs. 2-point: 5/39 (13%), p=0.03	Urinary incontinence or constipation, NS	No patient in either group reported dyspareunia	Healing abnormality: 5/39 (12.8%) 2-point vs. 0/40 (0%) 4-point, p=0.03	None reported
Mourtialon 2012[57], N=230 (short-term results of initial 143 patients: deTayrac 2007[60])	Prospective cohort (C)	Macroporous, lightweight polypropylene mesh coated with hydrophilic film (Ugytex) self-tailored to 5x5cm and fixed to arcus tendineous fascia pelvis at four points (FG, n=31) or with two arms in retropubic space (RP, n=32)	Macroporous, lightweight polypropylene mesh coated with hydrophilic film (Ugytex) fixed via transobturator passage with two or four arms (TO, n=142)	25.8 (TO) 32.9 (FG) 32.9 (RP)	TO: 56/142, 39.4% FG: 2/31, 6.5% RP: 3/32, 9.4%	Anterior wall stage ≥ 2: TO, 8/86 (9.9%) FG, 1/29 (3.4%) RP, 9/29 (31%) p=0.004 for three-arm comparison	More women improved in FG than in TO (p<0.05 on PFDI) or RP (p<0.05 on PFDI and PFIQ). Postoperative pain at 6mo: 12/86 (14%) TO vs. 0/29 FG vs. 0/29 RP, p NR	No overall change in dyspareunia or sexual activity rate from baseline.	Erosion: 6/29 (20.7%) FG vs. 18/86 (20.9%) TO vs. 7/29 (24.1%) RP, p=0.13	Mesh erosion: 13.2% overall; 12/142 (8.5%) TO vs. 3/31 (9.7%) FG, vs. 4/29 (13.8%) RP, p NR Recurrence of prolapse: 7/86 (8.1%) TO vs. 2/29 (6.9%) FG vs. 0/29 RP, p NR

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Feiner 2012[58], N=106	Prospective cohort (B)	Anterior polypropylene mesh placed using trocar-based kit (Anterior Prolift) (52)	Anterior polypropylene mesh placed using trocar-based kit (Perigee) (54)	Prolift: median 11.0 Perigee: median 11.5	15/106 (14%) did not return for exam but 100% patients completed questionnaires	<u>POP-Q Stage ≥ 2:</u> Anterior wall (Aa and Ba): Prolift: 11% (5/46) vs. Perigee: 20% (9/45), p=0.23 All compartments: Prolift 22% (10/46) vs. Perigee 24% (11/45), p=0.76	Subjective success rates: Prolift 94% (49/52) vs. Perigee 96% (52/54), p=0.62 Satisfaction VAS, recommend to friend, undergo surgery again, NS APFQ bowel, bladder, prolapse scales, NS	APFQ sexual scores, NS de novo dyspareunia: Prolift 3/46 (11%) vs. Perigee 5/45 (16%), NS	Erosion: Prolift 3/52 (6%) vs Perigee 2/54 (4%), NS; one in each group required surgical revision	SUI: 5/52 (10%) Prolift vs 3/54 Perigee (6%) underwent obturator sling Prolapse: 1 Prolift patient underwent vaginal hysterectomy, 2 Prolift patients required "remodeling of the posterior wall" Erosion: 1 patient in each group Urethrolysis: 1 patient in each group Overall reoperation rate 13%, no between-group difference, p=0.33

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Farthmann 2013[59], N=200	RCT (A)	Polypropylene monofilament mesh with six arms (102) (PP)	Polypropylene mesh with absorbable coating of polyglycolic acid and caprolactone with six arms and identical size/shape (98) (PA)	36	12 mo: 13/200 (6.5%) 36 mo: 33/200 (16.5%)	<u>POPQ > stage I at 36 mo:</u> Anterior: 2/80 (2.5%) PP vs 9/88 (10.2%), p=0.06 Any site: 15/80 (18.8%) PP vs 12/88 (13.6%) PA, p=0.41	Satisfaction and pain on visual scales: no difference at 36mo (NS)	Not reported	Visible mesh ≥1cm2: 3 mo: 11/97 (11.3%) PP vs 3/93 (3.2%) PA, p=0.049 12 mo: 6/91 (6.6%) PP vs 6/96 (6.3%), p=1.0 36 mo: 6/80 (7.5%) PP vs 3/88 (3.4%), p=0.31 Cumulative: 18.4% PP vs 10.7% PA, no p given	For recurrent POP: 3/80 PP vs 3/88 PA, no p given For mesh exposure: 8/80 PP vs 4/84 PA surgeries in 11 patients
Mourtialon 2012[57] and deTayrac 2007[60], N=205	Prospective cohort (C)	Self-tailored monofilament polypropylene mesh with hydrophilic coating (Ugytex) fixed to ATFP at four points (FG, n=31) or obturator foramen (TO, n=142)	Self-tailored monofilament polypropylene mesh with hydrophilic coating (Ugytex) fixed with two arms into retropubic space (RP, n=32)	37.7	61/207 (30%)	<u>Cystocele stage ≥2:</u> RP 9/29 (31%) vs. FG 1/29 (3%) vs. TO 8/86 (10%), p=0.004	Fewest women improved in retropubic group compared to other groups (p<0.05 on POPDI, UIQ, CRAIQ, POPIQ)	de novo dyspareunia rate overall 12.8% at 12mo, groups not specified	Erosion: RP 7/29 (24%) vs. TO 18/86 (21%) vs. FG 6/29 (21%), NS; overall erosion reoperation rate 13.2%, not different between groups	Recurrence in all compartments: RP 0/29, TO 7/86 (8%), FG 2/29 (7%), p NR Mesh erosions: RP 4/29, TO 12/86, FG 3/29, p NR Postop bleeding complications: 2 patients with hematomas returned to 1, group not specified.

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Wong 2014 [61] N=229	Retrospective cohort (C)	Macroporous, monofilament polypropylene Perigee mesh kit (138)	Macroporous, monofilament polypropylene Anterior Elevate mesh kit (91)	Median 1.09 years	229 patients presented for exam of 338 who underwent surgery during the referent 7-year time period (67.8%)	POPQ ≥ Stage 2: 46/138 (33.3%) Perigee vs 60/88 (68.2%) Elevate, p<0.0001	Satisfaction and subjective cure: 37/138 (26.8%) Perigee vs 18/91 (19.8%) of Elevate, p=0.22	Dyspareunia rate in sexually active women: 20/158 (12.7%) Pelvic Pain overall: 17/229 (7.4%), no difference between groups with no data given, p=0.38	19/229 (8%): 12/138 Perigee vs. 7/91 Elevate, p=0.85	None reported

Appendix 4. Studies of the Apical Vaginal Compartment

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Synthetic graft versus no graft										
De Tayrac 2008[64], N=49	RCT (B)	Multifilament polypropylene tape (IVS Tunneller) (24)	SSLS (25)	16.8	2/49 (4%)	Anatomic failure, not defined: IVS Tunneller 1/21 (4.8%) vs. SSLS 0/24 (0%), NS Cystocele >1: IVS tunneler 1/21 (4.8%) vs. SSLS 6/24 (25%), NS Rectocele >1: IVS tunneler 0/21 (0%) vs. SSLS 1/24 (4.2%), NS Point C or D after surgery: -6.4±2.2 IVS vs. -6.4±1.7 SSLS, NS	Postoperative day #1 pain on a 10-point VAS: 1.3±1.6 (IVS) vs. 3.2±2.7 (SSLS), p=0.005 Global quality of life VAS, PFDI, PFIQ: NS except POPDI: higher rate of worsened symptoms in SSLS group, p=0.02 Satisfaction: 85.7% IVS vs. 79.2% SSLS, NS	PISQ-12: 13.6±9.3 (IVS) vs. 12.5±9.3 (SSLS), p NR Rates of sexual activity comparable between groups	Mesh: no IVS tape erosions seen; 2 reinterventions in each group for anterior wall erosion, not otherwise specified.	Prolapse recurrence: 1 patient in each group
Cosma 2014[65], N=122	Retrospective case-control (C)	Posterior Intravaginal Slingplasty (PIVS): multifilament polypropylene mesh (53) monofilament polypropylene mesh (8)	USLS with single polysorb stitch (61)	56.2 (PIVS) 57.7 (USLS)	All patients followed for ≥36 mo	POPQ stage ≥ 2 at any site: 14/61 (22.9%) PIVS vs 22/61 (36%) USLS, p=0.16	Subjective cure (no bulge): 56/61 (91.8%) PIVS vs 53/61 (86.9%) USLS, p=0.25 PFIQ, Wexner constipation score (NS)	PISQ-12: no difference (NS); 57.3% sexually active in PIVS group, 47.5% in USLS group	Erosion: 4/61 (6.5%) and fistula/abscess: 1/61 (1.6%), all in PIVS group and all treated in office	For mesh removal in fistula patient: 1 (1.6%) in PIVS group
Synthetic non-absorbable mesh versus synthetic non-absorbable mesh										
Deffieux 2009[66], N=87	Retrospective cohort (C)	Multifilament polypropylene mesh tape (IVS Tunneller) (53)	Monofilament polypropylene mesh tape (I-STOP) (34)	27	I-STOP: 5/34 (14.7%) IVS: 3/53 (5.7%)	Recurrence POP-Q stage 1 or greater: 9/53 (18%) IVS group (C point -6 to -1) vs 4/24 (14%) I-STOP group (C point >+1), NS	Not reported	de novo dyspareunia: 3 in IVS group, 2 in I-STOP group	IVS: 5/53 (9) plus 1 patient had erosion of midurethral sling. I-STOP: 0/34 (0%) plus 4 patients had erosion of midurethral sling.	Mesh extrusion: 6 patients in IVS group, 4 patients in I-STOP group. Recurrence: 2 patients underwent hysterectomy.

Appendix 5. Studies of Multiple Vaginal Compartments

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Biologic graft versus no graft										
Ramanah 2010[67], N=126	Retropsective cohort (C)	Porcine collagen dermal matrix (InteXen), placed in 3 compartments (63)	Anterior colporrhaphy with SSLS (63)	35.7-37.1	0/126 0%	POP-Q stage 2 or greater: InteXen 11/63 (17%) vs. Native 5/63 (8%), p=0.12 Bp stage 2 or greater: InteXen 4/63 (6%) vs. Native 2/63 (3%), p=0.40	Not reported	Postoperative sexual activity rate: InteXen 34/63 (54%) vs. native 29/63 (46%) (NS) Dyspareunia: InteXen 0/63 (0%) vs. native 1/63 (3%) (NS)	None	Symptomatic prolapse recurrence: InteXen 8/63 (13%) vs native 3/63 (5%), p=0.12
Dahlgren 2011[68], N=135	RCT (B)	Porcine acellular collagen matrix (Pelvicol) (69)	AP repair (66)	36	10/135 (7.4%)	POP-Q stage 2 or greater: Pelvicol 38/65 (58%) vs. native 41/61 (67%), NS	Subjective improvement: Pelvicol (85%) vs. native (84%), p not given Bulge symptoms: Pelvicol (16%) vs. native (3%), p < 0.05 Urinary/fecal incontinence, NS	Sexual activity rate and dyspareunia, NS	Two graft erosions treated conservatively	5 patients in each group had "relapse operation"
Synthetic absorbable mesh versus no graft										
Sand 2001[69], N=160	RCT (B)	Polyglactin 910 mesh (Vicryl) placed anteriorly at trigone and cuff; if needed, also placed posteriorly (80)	Anterior and possible posterior colporrhaphy (80)	12	17/160 (11%)	Cystocele BW Grade 2 or greater: Mesh 18/73 (25%) vs. native 30/70 (43%), p=0.02 Rectocele BW Grade 2 or greater: Mesh 6/73 (8%) vs. native 7/70 (10%), p=0.71	Not reported	Not reported	None	Not reported

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Synthetic non-absorbable mesh versus no graft										
Carey 2009[70], N=139	RCT (A)	Polypropylene mesh anterior and posterior self-tailored placement (Gynemesh PS) (69)	AP repair (70)	12	15/139 (11%)	POP-Q stage 2 or greater: Mesh 12/63 (19%) Native 21/61 (34%), p=0.07	PSI-QOL, UDI, IIQ, CCCS,Satisfaction VAS (NS)	de novo dyspareunia: 5/30 (16.7%) mesh vs. 5/33 (15.2%) native, NS	4/63 (6%) in mesh group, 3 treated surgically; 1 midurethral sling erosion in native group	Recurrence: 2 patients from native group underwent mesh prolapse repair Pain: 2 patients in native group underwent vaginoplasty for stenosis
Iglesia 2010[72], Sokol 2012[73], Gutman 2013[71], N=65	RCT (B)	Polypropylene mesh inserted with trocar arms using kit (Total or Anterior Prolift) (32)	AP repair, USLS (33)	36	17% (11/65) At 36mo: 51/65 (78%) reported QOL outcomes, 41/65 (63%) POP-Q exams	POP-Q stage 2 or greater @ 12 mo: Mesh: 20/32 (63%) Native: 23/33 (70%), p=0.45 POP-Q stage 2 or greater @ 36mo: Mesh: 11/20 (45%) Native: 11/21 (43%), p>0.99	12 mo: PFDI, PFIQ (NS) de novo SUI: 4/13 mesh vs 3/19 native, NS Subjective cure @ 36mo: Mesh: 23/25 (92%) Traditional 21/26 (81%), NS 36mo: PFDI, PFIQ (NS)	12 & 36 mo: PISQ, dyspareunia rate (NS)	Enrollment halted early due to 15.6% erosion rate in mesh group at mean follow-up of 7.2mo, 3/5 patients required surgical management, 1/3 had a later 2nd exposure 5/33 (15%) native group had suture exposure, all treated in office	Mesh group: 5/32 patients (3 surgeries for mesh erosion, 4 surgeries for prolapse) Native group: 0/33

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Withagen 2011[74], Milani 2011[75], N=190	RCT (A)	Polypropylene mesh placed with trocars using Prolift kit: Anterior 40% Posterior 38% Anterior+Posterior 1% Total vaginal mesh 21% (93)	Anterior repair, posterior repair, vaginal hysterectomy, modified Manchester-Fothergill procedure, USLS, SSLS (97)	12	4/190 (2%)	<u>POP-Q stage 2 or greater in treated compartment:</u> Mesh 8/83 (9.6%) vs. native 38/84 (45.2%), p<0.001 Anterior wall stage 2 or greater: Mesh 4/51 (7.8%) vs. native 27/49 (55%), p<0.001 Posterior stage 2 or greater: Mesh 2/49 (4.1%) vs. native 14/57 (24.5%), p=0.003 Overall POP-Q stage 2 or greater: Mesh 41/83 (49%) vs. native 56/84 (66%), p=0.03	SUI, de novo pain, IIQ, UDI, Patient Global Impression of Improvement, NS Defecatory Distress Inventory: Pain (p=0.013) and incontinence (p=0.048) improved in mesh vs native	de novo dyspareunia at 12mo, NS PISQ-12, NS Mesh group had deterioration of behavioral/emotional subscale; native repair had improvement in physical and partner-related subscales. Native repair was associated with improvement (p=0.012) and mesh exposure was associated with decline.	14/83 (17%), 5 required surgery and 9 treated conservatively	Bleeding: One patient in native group Prolapse: 4/97 native underwent reoperation for treated compartment failure; 0/93 mesh patients underwent reoperation
Halaska 2012[76], N=168	RCT (A)	Polypropylene mesh inserted with trocar arms using kit (Total Prolift) (85)	SSLS (83)	12	17/168 (10%)	<u>POP-Q stage 2 or greater:</u> Mesh: 13/79 (17%) Native: 28/72 (39%), p=0.003	UIQ, POPIQ, de novo pain, SUI and OAB (NS)	PISQ, dyspareunia rate (NS)	Mesh exposure: 16/79, 20.8%; 10 required surgical revision	Recurrence: 3/83 native, 1/85 mesh

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Su 2014[77], N=210	Prospective Cohort (B)	Type 1 polypropylene mesh using Elevate anterior and posterior prolapse repair system and hysterectomy/hysteropexy with SSLF for vault prolapse (100)	AP repair, hysterectomy/hysteropexy with SSLF for vault prolapse (101)	12	9/210 (4.3%)	<u>POP-Q stage ≥ 2:</u> Anterior: 2/100 (2%) mesh, 13/101 (12.9%) native, p=0.006 Apical: Elevate 1/100 (1%) mesh, 4/101 (4%) native, NS Posterior: 0/100 mesh, 3/101 (3%) native, NS Overall: 3% mesh, 17% native, p=0.003	UDI-6, IIQ-7 (NS)	PISQ-12 (NS)	Mesh extrusion 3/100 (3%), p=o.o4	1/100 (1%) return to OR for vaginal mesh extrusion revision NS
Lopes 2010[78], N=32	RCT (B)	Polypropylene mesh placed posteriorly using kit (Nazca) (16)	SSLS, site-specific posterior repair (16)	12	2/32 (6%)	<u>POPQ points Aa, Ba, C, Ap, Bp, TVL:</u> No difference, p NS	KHQ (NS)	Not reported	Erosion: 5/16 (35.7%) mesh group, 1 required surgical revision	Recurrence: 1/14 mesh group Erosion: 1/14 mesh group
Cao 2013[79], N=173	Retrospective cohort (B)	Monofilament polypropylene mesh (Gynemesh) self-tailored and placed anteriorly and posteriorly, termed Modified Pelvic Floor Reconstructive Surgery (MFPR) (84)	AP repair (74)	Median 55-56 mo	15/173 (8.7%)	<u>POP-Q stage 2 or greater:</u> 12mo: mesh 7% vs. native 23% p=0.005 Longest postop visit: mesh 12% vs. native 35%, p=0.001 Posterior wall not different but improved anterior/apical results in mesh group, p>0.05	PFDI total score (NS); degree of score change preop to postop greater for mesh group (p<0.05)	de novo dyspareunia: 7/84 (8%) mesh vs 3/74 (4%) native, NS	Erosion: 3/84 (3.6%) mesh, all treated in office	Not reported

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Lo 2014[80], N=198	Retrospective cohort (B)	Perigee polypropylene graft + unilateral SSL via posterior approach with single polypropylene suture (114)	Anterior colporrhaphy + unilateral SSLS via posterior approach with single polypropylene suture (72)	59.6 (mesh) vs 62.6 (native)	All patients completed at least 36 mo follow-up	POPQ stage >1: Anterior: 0/114 mesh vs. 14/72 (19.4%) native, p<0.001 Apical: 0/114 mesh vs. 2/72 (2.8%) native, p=0.149 Posterior: 11/114 (9.6%) mesh vs. 9/72 (12.5%) native, p=0.408	Subjective cure: POPDI-6 difference pre to post: -5.2±4.8 mesh vs -3.5±4.6 native, p<0.001 UDI-6 and IIQ-7: No difference	PISQ-12: 29.0±5.4 in 67/114 pts (58.7%) mesh vs. 25.8±7.0 in 33/72 pts (45.8%) native, p=0.008	4/114 (3.5%), all treated in office	2/72 (2.8%) with apical failures in native group underwent mesh repair
Svabik 2014[81], N=70	RCT (A)	Prolift Total polypropylene mesh kit (36)	SSLS with two permanent sutures on the right and traditional AP repair (34)	12	0/70 (0%)	Leading edge of anterior, posterior, or apex at or beyond the hymen on exam; US showing bladder descent ≥ 10mm below the pubis: Exam: 1/36 (3%) Prolift & 22/34 (65%) SSLS US: 1 (3%) Prolift vs. 21 (62%) SSLS on US, p< 0.001 for both	12mo scores of Prolift vs. SSLS: UDI 22.7 vs 24.5, P=0.66 POPDI 15.3 vs 21.7, P=0.16 CRADI 15.5 vs 31.6, P=0.09 Stress incontinence on ICIQ-SF: 16/36 (44.4%) Prolift vs 10/34 (29.4%) in SSF, p=0.19	PISQ, NS Dyspareunia: 2/36 mesh vs. 1/34 native	3/36 (8%) mesh exposure in Prolift, 5/34 (15%) bleeding due to granulation tissue in SSF, all treated in office.	SUI: 11 pts in Prolift group and 3 in SSLS group underwent SUI sling placement at 3mo. Prolapse: 3 SSLS patients at 3mo with prolapse recurrence underwent mesh prolapse repairs. Exposure: 2 mesh excisions were performed at time of subsequent sling.

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Dos Reis Brandão da Silveira 2015[82], N=184	RCT (A)	Prolift Total, Anterior, & Posterior polypropylene mesh kit (94)	SSLS with permanent suture on the right + AP site-specific repair if needed (90)	12	15/184 (8.2%)	Leading edge beyond the hymen (Ba, Bp, or C > 0): Native vs Mesh: Ba = 24/81 (29.6%) vs 12/88 (13.6%) P=0.019 Bp = 7/81 (8.6%) vs 2/88 (2.3%) P = 0.089 C = 13/81 (16%) vs 7/88 (8%) P=0.165	P-QOL better in mesh group: Native = 29.9 ± 17 (N=81) vs mesh = 24.2 ± 9.1, p=0.008	QS-F: Native 22.4 ± 13.8 (N=14) vs. mesh 21.8 ± 10.4 (N=25), p=0.9	Extrusion: Mesh 18/88 (20.5%) vs. native 6/81 (7.4%), p=0.027	Overall: Native = 3/81 (3.7%) all recurrence vs. Mesh = 7/88 (7.9%), 2 recurrence, 3 exposure, 1 dehiscence, 1 rectal extrusion; p NR
Graft/mesh versus other types of graft/mesh										
Long 2011[83], N=108	Retrospective cohort (C)	Polypropylene mesh inserted with trocars using kit (Prolift) (48)	Polypropylene mesh inserted with trocars using kit (Perigee/Apogee) (60)	12 (Prolift) vs. 20 (Perigee/Apogee), p<0.01	0/100 (0%) 130 patients eligible from time period, 22 excluded for incomplete records or use of anticholinergics	POP-Q ≥ stage 2 of any compartment: Prolift 1/48 (2%) Perigee/Apogee 3/60 (5%), p NS Prolift superior for anterior wall (p<0.01) but no differences of other compartments.	Urodynamic parameters, NS	Dyspareunia (worse or de novo): 16.7% Apogee/Perigee vs 25% Prolift, NS	Vaginal erosion: 8/48 (16.7%) Prolift vs. 6/60 (10%) Apogee/Perigee, NS	Mesh erosion: 7 Prolift and 4 Apogee/Perigee women required "debridement" after conservative measures failed; 1 required repeat revision

Study Author, year, number of patients	Study Design (Quality grade)	Graft Type (n)	Comparator (n)	Mean Follow-up (mos)	Loss to follow-up (n,%)	Anatomic Failure, (definition, N,%)	Symptomatic Outcomes	Sexual Function Outcomes	Mesh or graft exposure/erosion	Return to OR
Chen 2012[84], N=223	Prospective observational cohort (C)	Monofilament polypropylene mesh (Gynemesh) self-tailored and placed anteriorly and posteriorly, termed Modified Pelvic Floor Reconstructive Surgery (MFPR) (131)	Polypropylene mesh inserted with trocars using kit (Prolift) (92)	Median 36	Not reported	POPQ ≥ stage 2 of any compartment: 12 mo: MFPR 10% vs. Prolift 6%, p=0.25 Longest follow-up visit: MFPR 13% vs. Prolift 7%, p=0.13 Prolift superior for treatment of anterior (p=0.02) and posterior prolapse (p=0.01) at 12mo.	PFDI (lower score = better QOL): MFPR 36.8 ± 30.1 Prolift: 21.1 ± 23.5, p=0.03	de novo dyspareunia at 12mo: MFPR 6/131 (4.6%) vs. Prolift 2/92 (2.2%), NS	MPFR 5/131 (3.8%) vs Prolift 6/92 (6.5%), NS, all treated in office	Not reported
Lensen 2013[85], N=641	Retrospective cohort (B)	Macroporous monofilament polypropylene mesh inserted using kit (Prolift) (347)	Macroporous monofilament polypropylene and polyglecaprone-25 inserted using kit (Prolift+M) (222)	12	72/641 (11.2%)	POP past the hymen and vaginal bulge symptoms or surgical reintervention for prolapse: 26/340 (8%) Prolift vs 6/173 (4%) Prolift+M, p=0.07	PGI-I: no difference (NS) Any form of UI: no difference (NS) Bulge symptoms: no difference, no p given	Sexually active and dyspareunia rates – no difference(NS)	44/347 (12%) Prolift vs 12/222 (5%) Prolift+M, p<0.001	POP (treated or untreated compartments): 22/347 (6%) Prolift vs 2/222 (1%) Prolift+M, p=0.002 Mesh: 17/44 (39%) exposures Prolift vs 5/12 (42%) Prolift+M, p NR Hemorrhage: 0/347 Prolift vs 2/222 (1%) Prolift+M, p=0.96

Appendix 6.

Note: These individual categories pertain ONLY to repairs that address the specific compartment, with the exception of "multiple compartment". Thus, "anterior wall repair" pertains to surgical repair of only the anterior vaginal wall without planned graft/mesh repair of another vaginal compartment. We refer to biologic materials as "graft" and synthetic materials as "mesh".

ANTERIOR WALL ONLY

- When performing isolated anterior vaginal wall repair, we recommend native tissue repair compared to biologic graft (Strong).
- When performing isolated anterior vaginal wall repair, we suggest native tissue repair compared to synthetic absorbable mesh (Weak).
- When performing isolated anterior vaginal wall repair, we recommend use of synthetic nonabsorbable mesh, specifically polypropylene, for anatomic objective cure of prolapse and bulge symptoms compared to native tissue repair, although there is not enough evidence to find a difference for urinary incontinence, pain, dyspareunia, or reoperation rate. (Strong).
- We are not able to provide practice recommendations regarding specific graft or mesh use due to the heterogeneity of the studies in which different graft/mesh products are compared at the anterior vaginal wall.

POSTERIOR WALL ONLY

- When performing isolated posterior vaginal wall repair, we recommend native tissue repair compared with biologic graft (Weak).
- When performing isolated posterior vaginal wall repair, there is insufficient evidence to compare native tissue repair and the use of a synthetic nonabsorbable mesh.

APICAL COMPARTMENT ONLY

- When planning isolated repair of the vaginal apex via the vaginal route, we recommend native-tissue repair compared with synthetic nonabsorbable or absorbable mesh (Weak).

MULTIPLE COMPARTMENT REPAIRS

- When performing simultaneous repair of multiple vaginal compartments, we suggest native tissue repair compared to use of a biologic graft (Weak).
- When performing simultaneous repair of multiple vaginal compartments, we suggest native tissue repair compared to use of a synthetic absorbable mesh (Weak).
- When performing simultaneous repair of multiple vaginal compartments, we recommend use of a synthetic nonabsorbable mesh, specifically polypropylene, compared to native tissue repair for objective anatomic cure of prolapse (Strong). There is not enough evidence to find a difference for subjective cure, bulge symptoms, urinary incontinence, sexual function, pain, or reoperation rate.
- We are not able to provide practice recommendations regarding specific graft or mesh use due to the heterogeneity of the studies in which different graft/mesh products are compared for the simultaneous repair of multiple compartments.

Schimpf MO, Abed H, Sanses T, White AB, Lowenstein L, Ward RM, et al. Graft and Mesh Use in Transvaginal Prolapse Repair: a systematic review. Obstet Gynecol 2016;128.
The authors provided this information as a supplement to their article.
