Int Urogynecol J (2014) 25:81–89
DOI 10.1007/s00192-013-2166-z

ORIGINAL ARTICLE

Long-term follow-up after native tissue repair for pelvic organ prolapse

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Received: 17 April 2013 / Accepted: 18 June 2013 / Published online: 6 July 2013
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Abstract
Introduction and hypothesis There are large variations in reported frequency of recurrence and subsequent treatment after pelvic organ prolapse (POP) surgery. We hypothesized that native tissue repair entails high subjective satisfaction and good objective results, with low POP reoperation rates and few complications.
Methods The 1-year results of 699 women having had native tissue repair for POP at our urogynecological unit from 2002 to 2005 were evaluated using an internal quality control database. A short-form physician check list for patient subjective and objective outcomes has been routinely used for 1-year controls since 2002, and results are registered longitudinally in the database. Patients' medical records up to 2012 were reviewed for information on recurrent POP symptoms. A telephone interview was performed to assess POP recurrences potentially treated elsewhere. The cumulative incidence for reoperation was calculated comparing partial with complete (surgical treatment of all three compartments) native tissue repairs.
Results Subjective satisfaction was stated by 94 % of patients at the 1-year control, and 84 % had stage 0–I in any compartment using the POP Quantification (POP-Q) system. The 5-year reoperation rate was significantly lower in the complete vs. the partial (2.6 % vs. 8.9 %) repair group. Cumulative incidence of reoperation showed a slight but constant increase over the years.
Conclusions POP surgery using native tissue repair entails low reoperation rates with excellent subjective and objective results and should be the first choice in treating primary POP, providing use of adequate surgical technique.

Keywords Pelvic organ prolapse surgery · Recurrence rates · Long-term follow-up

Introduction

A large number of women will desire surgical repair for bothersome symptoms caused by pelvic organ prolapse (POP) during their lifetime. The reported lifetime risk of undergoing POP surgery is estimated to be 11 %–19 % [1, 2]. Population-based studies describing subjective and objective results after POP surgery report large variations in frequency of POP recurrence and subsequent surgery, ranging from 2.9 % to 30 % [2–7]. Results based on subjective symptoms also differ widely [8]. In addition, POP operating techniques and surgical traditions vary considerably between surgical centers and countries. There are no standardized definitions of cure following POP repairs, and the published long-term results after POP repairs are therefore not necessarily comparable [8, 9]. However, as many follow-up studies report a higher frequency of recurrence than we observe in our daily clinical urogynecological hospital setting [2, 5, 6], we decided to put our own long-term results under scrutiny.

In many countries, the use of mesh in POP repair has been increasing in recent years, with reported low short-term risk of POP recurrence. However, increased rates of postoperative complications and subsequent reoperations due to new and troublesome symptoms, especially those caused by mesh exposure, have been reported [10–12]. The potential for

Parts of the data were presented at the 42nd Annual Scientific Meeting of the International Continence Society (ICS), Beijing, China, October 17th 2012

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complications associated with POP repair using mesh, especially for sexually active women, are worrying [12], leading the US Food and Drug Administration (FDA) to issue a public health notification in 2008, with an update in 2011. In our department, native tissue repair is implemented for most patients with genital prolapse, and the use of vaginal mesh is limited to a very few selected cases of POP recurrences using biological mesh only. Synthetic grafts are exclusively used in sacocolpopexies, which in our unit are all done via laparoscopy and are limited to a small, select patient group of younger women. All patients with primary prolapse and the vast majority of those with secondary prolapse are operated with native tissue techniques and focus on appropriate anatomical reconstruction of all three vaginal compartments [13, 14].

Our hypothesis for this study, based on our clinical experience, was that individualized native tissue repair for POP, with the traditional Manchester operation (including repair of all three vaginal compartments) being the preferred procedure [13], can result in excellent subjective and objective outcomes with low long-term POP reoperation and complication rates.

Materials and methods

This was a population-based prospective study of all patients operated with native tissue repair techniques for POP from 2002 to 2005 at the Urogynecological Unit of the Gynecological Department at Oslo University Hospital, Ullevål. Since 2002, preoperative and 1-year follow-up data at this unit have been longitudinally stored in an internal clinical quality database. This department serves as both a local hospital for the city of Oslo, taking care of a population of about 300,000 women and as a tertiary referral center for other regions of Norway. Native tissue repair is the preferred surgical method for almost all patients, and procedures are individualized for optimizing anatomical results and reducing the risk of relapse. The predominant technique is a three-compartment vaginal repair known as the Manchester procedure. This procedure includes an anterior colporrhaphy, with separation of the cardinal and sacrouterine ligaments from the cervix. The ligaments are shortened and transposed to the anterior aspect of the isthmus, which results in elevation and backwards displacement of the vaginal apex, thereby stretching the anterior wall. In our opinion, the latter is the most important step in treating most cystoceles. The extent of cervical amputation depends on the degree of cervical hypertrophy and is not essential when the cervix is short. The crucial part of this midcompartmental procedure is that the ligaments are shortened and transposed and is not the amputation of a normal-sized cervix per se. An extensive posterior repair is only performed when necessary, but reconstruction of the perineal body to support the anterior wall and thereby avoid recurrences is frequently part of the procedure [13]. For elderly women who are not sexually active and do not want the option of vaginal intercourse, obliterative surgical procedures (colpocleisis) are used. In order to minimize the risk of urinary incontinence and extensive scarring, the preferred colpocleisis method is a partial procedure using levator ani muscle suturing to obtain semiobliteration of the vagina [15]. In our unit, urogynecologists, or residents with assistance from experienced urogynecologists, operate the majority of POP patients.

From 2002, all patients operated for POP are registered prospectively in an internal clinical quality-control database and scheduled for a routine 1-year follow-up with a urogynecologist or general gynecologist. At this 1-year control, patient information is registered according to a standard checklist used by the physician, containing questions on POP symptoms, altered sexual function, urinary obstructive symptoms or incontinence, altered bowel function, and use of local or systemic estrogen therapy. Subjective satisfaction was defined as being completely cured or improved from the prolapse problem, with options in the checklist being cured, improved, unchanged, and deteriorated. All postoperative complications occurring within the first postoperative year are also registered. The clinician carries out a pelvic exam and classifies any POP findings in stages 0–IV according to the POP Quantification (POP-Q) system recommended by the joint International Continence Society/International Urogynecological Association (ICS/IUGA) terminology report on female pelvic floor dysfunction [16]. The doctor fills out the checklist, and a secretary enters the data into an electronic database.

For this study, objective and subjective 1-year follow-up results were extracted from the standardized electronic database for all patients operated for POP from 1 January 2002 to 31 December 2005 (n=726). We excluded patients operated with sacrocolpopexies (n=20, using synthetic mesh) and vaginal repairs using biological mesh (n=7) from the analyses, as these procedures cannot be classified as native tissue repairs (Table 1).

To evaluate 5-year reoperation rate and cumulative incidence of reoperation for the entire follow-up period, the hospital medical records for the same patients were reviewed until the end of February 2012 to rule out any surgery for recurrent POP not entered into the database. We performed a telephone interview during 2011–2012, finalized at the end of February 2012, to register any patient with a repeat POP surgery performed at other hospitals. All patients still alive were contacted, with the exception of women who had already undergone repeat POP surgery at our department (n=40), one woman postponing recurrent POP surgery with use of a pessary (n=1), women with recent sufficient information in their medical records due to a recent visit (n=14). We were unable to obtain information on five patients due to

Table 1 Pelvic Organ Prolapse (POP) procedures performed in 2002–2005 (n=726)

	Primary operations (n=663)		Previous POP surgery (n=63)		Total POP surgery (n=726)		Native tissue repairs (n=699)	
	Percent	No	Percents	No.	Percent	No.	Percent	No.
Manchester	63.2	419	19.0	12	59.4	431	61.7	431
Posterior colporrhaphy	12.8	85	7.9	5	12.4	90	12.9	90
Anterior colporrhaphy	6.0	40	19.0	12	7.2	52	7.4	52
Colpocleisis	4.1	27	7.9	5	4.4	32	4.6	32
Enterocele operation	3.0	20	17.5	11	4.3	31	4.4	31
Vaginal hysterectomy	3.9	26	1.6	1	3.7	27	3.9	27
Sacrospinous fixation	2.8	19	9.5	6	3.4	25	3.6	25
Isolated amputation of the cervix	1.5	10	1.6	1	1.5	11	1.6	11
Total	97.4	646	84.1	53	96.3	699	100.0	699
Laparoscopic sacrocolpopexy	2.1	14	9.5	6	2.7	20	Not included in the study analyses	
Anterior biological mesh	0.2	1	6.3	4	0.7	5		
Posterior biological mesh	0.3	2	0.0	0	0.3	2		

institutionalization in nursing homes; four patients emigrated from the country. A total of 547 patients were contacted by phone. All nonresponders were called five times before resigning (n=33/547). This implies that we were unable to obtain information on 42 patients and that 514 patients ended up being interviewed by phone. During the telephone interview, we asked for any subjective symptoms of POP and whether the patient had been treated for POP in other centers during the postoperative years. Women complaining of new POP symptoms were offered an outpatient consultation to evaluate the need for further treatment (n=17).

Statistical analyses were performed using Statistical Package for the Social Sciences (SPSS_PC), version 18, and R version 2.15. Data on patients and surgical procedures are presented as frequencies (%). A cumulative incidence for reoperation (defined as any new surgery for POP following a previous POP repair) was calculated to compare native tissue complete repairs with native tissue partial repairs using a competing risk model [17]. This model was chosen because the study population consisted of relatively elderly patients, with a significant number of deceased patients during the postoperative study years due to causes unrelated to POP surgery (n=88/699), thereby adequately presenting the risk of new surgery based on living patients. The different parameters were evaluated comparing complete and partial repairs using the chi-square test (Table 2), which was also used to compare the same parameters after stratifying patients into preoperatively small (stage II) and large (stages III–IV) prolapse.

The study was approved according to institutional and national regulations. Quality-control studies are exempt from regional ethical committee evaluation in Norway, and written patient consent is not necessary when quality-control parameters are evaluated for treatment already in use. The department head gave study approval, and the institutional personal data officer approved data handling and clinical patient interviews. Methods, definitions, and units conform to the standards recommended by the ICS/IUGA joint report on the terminology for female pelvic floor dysfunction [16].

Results

Figure 1 shows the cohort of patients who had POP native tissue repair at our department between 2002 and 2005. Long-term follow-up data include patients lost to follow-up. Six hundred and ninety-nine patients underwent vaginal POP surgery with native tissue repair techniques and had a median age of 67 years at the time of surgery. Most operations were for primary POP (92.4 %; 646/699), whereas 7.6 % (53/699) were reoperations for POP. Several reoperations were on patients referred from other gynecological centers.

The different types of POP surgical procedures performed in our unit from 2002 to 2005 are shown in Table 1. The Manchester operation was the preferred procedure, performed in 61.7 % of procedures, using native tissue repair. Table 2 depicts subjective and objective findings at the 1-year follow-up comparing native tissue complete (Manchester operations and colpocleisis) with partial repairs. In Table 3, colpocleisis are excluded in order to better present the separate results of the Manchester operations. Partial native tissue repairs included posterior repairs (posterior colporrhaphies and enterocele operations), anterior colporrhaphies, as well as midcompartmental operations for apical defects without concomitant repair in both anterior and posterior compartments (e.g., sacrospinous

Table 2 One-year postoperative results and reoperations following native tissue pelvic organ prolapse (POP) repairs (n=699)

	Total number of patients in database	Complete repairs (Manchester/ colpocleisis) (n=463)	Partial repairs (n=236)	Total	P value
Percentiles (25/50/75)					
Age (years)	699	57/68/77	55/64/74		P=0.022
Percents (number of patients/total in group)					
Preoperative stage	689				P=0.429
Stage II		35.2 % (160/454)	38.3 % (90/235)	36.3 % (250)	
Stage III–IV		64.8 % (294/454)	61.7 % (145/235)	63.7 % (439)	
Postoperative stage	641				P=0.014
Stage 0–I		87.0 % (361/415)	78.3 % (177/226)	83.9 % (538)	
Stage II		9.4 % (39/415)	14.6 % (33/226)	11.2 % (72)	
Stage III		3.6 % (15/415)	7.1 % (16/226)	4.8 % (31)	
De novo incontinence	657				P=0.328
Urgency		5.4 % (23/429)	7.0 % (16/228)	5.9 % (39)	
Stress		2.8 % (12/429)	5.3 % (12/228)	3.7 % (24)	
Mixed		0.5 % (2/429)	0.4 % (1/228)	0.5 % (3)	
Total, de novo incontinence		8.6 % (37/429)	12.7 %(29/228)	10.0 % (66)	
Urinary retention	656				P=0.601
Minimal		12.1 % (52/428)	14.5 % (33/228)	13.0 % (85)	
Severe		1.6 % (7/428)	2.2 % (5/228)	1.8 % (12)	
Dyspareunia	648				P=0.314
Yes		8.3 % (35/423)	10.7 % (24/225)	9.1 % (59)	
Postoperative complications	676				P=0.082
Hematoma		5.6 % (25/445)	4.3 % (10/231)	5.2 % (35)	
Infection		0.7 % (3/445)	3.0 % (7/231)	1.5 % (10)	
Other		3.1 % (14/445)	2.2 % (5/231)	2.8 % (19)	
Subjective result	661				P=0.037
Improved		95.4 % (411/431)	90.9 % (209/240)	93.8 % (620)	
Unchanged		3.0 % (13/431)	4.3 % (10/240)	3.5 % (23)	
Deteriorated		1.6 % (7/431)	4.8 % (11/240)	2.7 % (18)	
Reoperation rate	699				
1 year		0.9 % (4/463)	1.7 % (4/236)	1.1 % (8)	P=0.326
5 years		2.6 % (12/463)	8.9 % (21/236)	4.7 % (33)	P<0.001

Not all variables were complete for all patients

fixations for isolated vault prolapse or following vaginal hysterectomies for isolated uterine prolapses). Vaginal hysterectomies (for coexisting indications) without vault suspension in combination with anterior/posterior colporrhaphies were also included in the partial native tissue repair group. Subjective satisfaction was 95.4 % for patients treated with total repair (Table 2), 95.0 % for Manchester operations (Table 3), and 90.9 % for patients treated with partial repair (Table 2). Postoperative hematomas were slightly more common in the complete repair group (5.6 % vs. 4.3 %); there was an inverse trend with regard to postoperative infections (0.7 % vs. 3.0 %), as shown in Table 2. Other complications, such as severe urinary retention, had an incidence of about 2 % in all groups. Postoperative sexual discomfort was described by 8.9 % (35/395) of women treated with a Manchester operation (Table 3) and 10.7 % (24/225) of women who received a partial repair (not significant) (Table 2).

Comparing results according to preoperative POP stage revealed similar subjective and objective success rates for patients with preoperatively small (POP-Q stage II) and larger (POP-Q stage III–IV) prolapses. However, patients with stage II tended to be slightly less satisfied [92.5 % (222/240) vs. 94.4 % (391/414)] and to have more dyspareunia [12.2 % (29/237) vs. 7.2 % (29/404)], but these differences were not statistically significant.

From patients' hospital medical records, 40 patients were registered as being reoperated at our department for a POP recurrence after initial surgery: 30 were within 5 years; two of

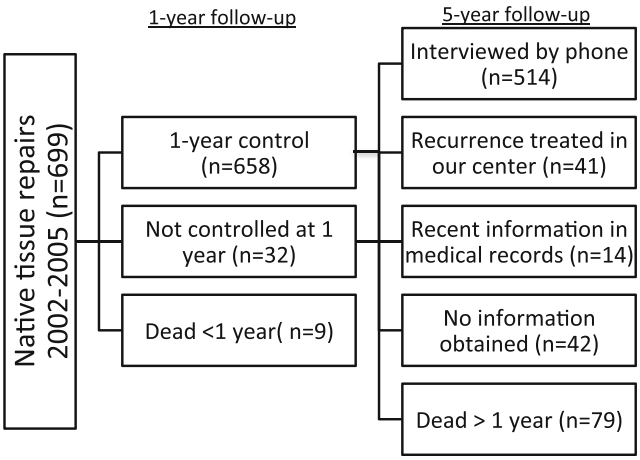

Fig. 1 Study follow-up after native tissue repairs for pelvic organ prolapse (POP) in 699 patients operated from 2002 to 2005

these 30 received more than one resurgery, and one of the 30 had additionally been reoperated at another surgical unit. One patient had a recurrence treated with pessary.

We managed to interview by phone, the majority of the patients contacted (94.0 %; 514/547). Only three reported repeat POP surgery outside the department, all within 5 years postoperatively. An expressed need for additional clinical follow-up due to subjective symptoms that could suggest POP were reported by 17 patients. All of them were evaluated in the outpatient clinic, and only seven of them had an objective POP (stage ≥II) and were offered treatment. As the study was finalized at the end February 2012, these patients were not included in the analysis. Figure 2 shows the cumulative incidence of reoperation for the complete repair group in comparison with the partial repair group.

Discussion

Our study shows a 4.7 % 5-year reoperation rate for POP-operated patients in our clinic, which is significantly lower than that reported in many previous follow-up studies [2, 5,

Table 3 One-year postoperative results and reoperations: Manchester operations vs partial native tissue repairs (n=667)

	Number	Manchester operations (n=431)	Partial repairs (n=236)	Total (n=667)	P value
Percentiles (25/50/75)					
Age	664	56/67/75	55/64/74		P=0.237
Percents (numbers of patients/total in group)					
Preoperative stage	659				P=0.658
Stage II		36.6 (155/424)	38.3 (90/235)	37.2 (245)	
Stage III–IV		63.4 (269/424)	61.7 (145/235)	62.8 (414)	
Postoperative stage	617				P=0.02
Stage 0–I		86.7 (339/391)	78.3 (177/226)	83.6 (516)	
Stage II		9.7 (38/391)	14.6 (33/226)	11.5 (71)	
Stage III–IV		3.6 (14/391)	7.1 (16/226)	4.9 (30)	
De novo incontinence	630				P=0.341
Urgency		5.0 (20/402)	7.0 (16/228)	5.7 (36)	
Stress		3.0 (12/402)	5.3 (12/228)	3.8 (24)	
Mixed		0.5 (2/402)	0.4 (1/228)	0.5 (3)	
Dyspareunia	620				P=0.461
Yes		8.9 (35/395)	10.7 (24/225)	9.5 (59)	
Postoperative complications	645				P=0.135
Hematoma		5.1 (21/414)	4.3 (10/231)	4.8 (31)	
Infection		0.7 (3/414)	3.0 (7/231)	1.6 (10)	
Other		2.9 (12/414)	2.2 (5/231)	2.6 (17)	
Subjective result	633				P=0.062
Improved		95.0 (383/403)	90.9 (209/240)	93.5 (592)	
Unchanged		3.2 (13/403)	4.3 (10/240)	3.6 (23)	
Deteriorated		1.7 (7/403)	4.8 (11/240)	2.8 (18)	
Reoperation rate	667				
1 year		0.9 (4/431)	1.7 (4/236)	1.2 (8)	P=0.381
5 years		2.8 (12/431)	8.9 (21/236)	4.9 (33)	P<0.001

Not all variables were complete for all patients

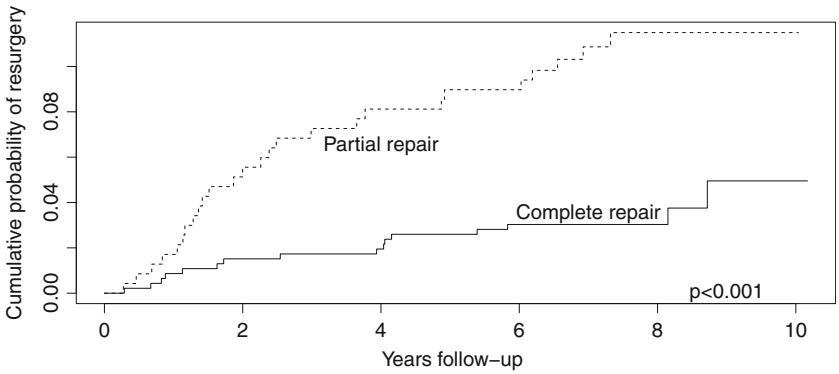

Fig. 2 Cumulative incidence of reoperation following native tissue repairs for pelvic organ prolapse (POP) 2002–2005 (n=699)

6]. This lower reoperation rate could possibly be due to demographic differences or reflect surgical techniques. Our study population had a relatively high median age (67 years) at the time of POP surgery compared with other published studies [5, 18, 19], and there is a possibility that older women may have a higher threshold for wanting new surgery after recurrence if they experience minor subjective symptoms. However, other studies demonstrate that older age alone is not an independent risk factor for prolapse reoperations [3, 5].

We believe that our low reoperation rate is mainly explained by surgical technique. The majority of our patients are operated by urogynecologists with a special interest in pelvic floor anatomy and reconstruction. The prevalence of hysterectomy for benign causes is relatively low in our Norwegian population compared with other countries [20]. Most of our POP operated patients therefore have their uterus intact, enabling a shortening and repositioning of the cardinal/sacrouterine ligaments for apical support and elevation, as described in Methods. This method for fixation and elevation of the apex is rigorously used in our department when repairing anterior and midcompartmental prolapses. The continuous focus on clinical education and anatomical restoration techniques for POP using native tissue in our department is probably an important contributor to our good subjective and objective results.

The cumulative incidence of POP reoperations for both patient groups was very low (Fig. 2), but both the risk of reoperation with up to 10 years of follow-up and the 5-year reoperation rate were significantly lower among those operated with a procedure repairing all three compartments (Manchester operation or colpocleisis) compared with the group treated with a partial repair (P<0.001). Despite this not being a randomized controlled trial, we believe this difference stresses the importance of performing a complete repair when possible to avoid recurrences, focusing both on apical support and reconstruction of the perineal body. This is also supported in the literature, in which Dällenbach et al. demonstrated the absence of complete POP repair at the initial surgery as an independent risk factor for reoperations [3]. Our study also illustrates a linear relationship between time from surgery and reoperation rate (Fig. 2). This is consistent with findings by Gotthard et al. in a retrospective cohort study of 456 patients, which shows that many relapses are registered several years after initial surgery [4]. We believe that long-term follow-up after POP surgery is therefore necessary when assessing reoperation rates. The possibility for recurrences, even after many years, should be part of the information provided when counseling women prior to any POP surgery. However, as many such patients are elderly, a need for POP reoperation after several years may not necessarily be due to surgical failure but could, at least partially, represent de novo POP caused by weakened connective tissue support with advancing age.

In recent decades, many centers have developed a tradition of only operating the POP compartment causing symptoms (for instance, selective anterior colporrhaphy for a cystocele) with “site-specific” repairs, as minimal surgery is seen as the best practice. Reconstructions of the perineal body are therefore not done, especially not in younger women, due to fears of postoperative pain or dyspareunia. This approach stands in stark contrast to the tradition at our department, where the Manchester operation is by far the most implemented method. We postulate that long-term anatomical results of these partial repairs are inferior to the results in our population of mainly complete anatomical POP repairs.

Sexual discomfort was described at the 1-year follow-up by 8.9 % (35/395) of women who received a Manchester repair (Table 3). The question posed on dyspareunia at the 1-year control is intended to describe de novo dyspareunia. However, we do not have information on the number of patients who complained of dyspareunia, even before the surgery, as this is not systematically recorded in the patient preoperative medical records. However, due to these figures, we find it unlikely that performing the three-compartment POP repair technique increases the risk of dyspareunia significantly. Although we have no age-matched control group of women, we find this dyspareunia rate acceptable, especially when compared with studies reporting dyspareunia in

up to 62 % of patients after posterior POP repairs using synthetic mesh [21]. Our dyspareunia rate of 8.9 % is also considerably lower than the postoperative dyspareunia rate of 16–17 % described by Abramov et al. after both classic posterior colporrhaphy and native tissue site-specific repairs [22]. We believe our relatively low dyspareunia rate is due to careful reconstruction of the perineal body and also to systematically avoiding levator ani muscle suturing in sexually active women.

At the 1-year postoperative control, 95.4 % in the complete repair group, 90.9 % in the partial repair group (Table 2), and 95.0 % of those treated with a Manchester operation (Table 3) reported subjective satisfaction (reporting to be completely cured or improved from their POP symptoms). At the telephone interview 6–10 years after their POP surgery, 96.1 % of those interviewed (494/514) were still without symptoms suggesting POP, and only one of three of them had objective POP at clinical examination. This supports our initial clinical impression that appropriate native tissue repair gives results that are durable over time. Patients with a preoperative stage III–IV prolapse tended to be slightly more subjectively satisfied and have less dyspareunia at their 1-year control compared with those with lower-grade prolapses. This finding is compatible with our clinical tradition of restrictive counseling for operative POP surgery in women with minor symptoms from a low-stage POP.

Objective findings at the 1-year follow-up were slightly inferior to the subjective patient satisfaction, and this indicates that POP symptoms poorly correlate with objective POP staging, as also described by other authors [19]. Some patients may report no subjective postoperative bother, even with a postoperative grade II or a more prominent prolapse, and this could possibly be explained by the fact that anatomical changes provided by POP repair still cause subjective improvement. However, for most patients, clinical findings were in accordance with their subjective report, as 87.0 % of complete repairs (86.7 % of the Manchester repairs) and 78.3 % of the partial repairs had POP stage 0–I at the 1-year follow-up. Objective findings were significantly better among patients in the complete repair group (P=0.014, Table 2).

De novo urinary incontinence [stress (SUI) and/or urgency (UUI)] following POP surgery is a well-known complication that may substantially reduce the patient's quality of life and is difficult to predict preoperatively [23, 24]. In our study, this was reported by 8.6 % for the complete repair group and by 12.7 % for the partial repair group. An incidence of postoperative combined SUI and UUI of 10.0 % (for the total patient group) is consistent with that previously described [23]. For all our POP procedures, de novo UUI at the 1-year follow-up was slightly more common than de novo SUI (complete repairs 5.4 % vs. 2.8 %; partial repairs 7.0 % vs. 5.3 %). We find it is important to communicate with patients preoperatively regarding the risk for bothersome UUI after POP surgery, as UUI is generally more challenging to treat than SUI [25]. However, we also know that UUI improves in some patients following POP surgery, especially if there was a high POP stage [26]. However, our preoperative data on urinary incontinence are not complete enough to report the incidence of urinary incontinence improvement following POP surgery. The clinical tradition at our department for treating women with combined POP and SUI is to postpone an incontinence procedure (tension-free vaginal tape). If the patient reports bothersome urinary incontinence of any type 3 months postoperatively, whether de novo, persisting, or worsening, she is urodynamically investigated and offered adequate treatment options.

This population-based prospective study was based on the total patient population surgically treated for POP at the largest urogynecological unit in Norway. Our data are prospectively and longitudinally recorded in an internal clinical quality-control database. In our opinion, our study results better reflect surgical outcomes in a routine gynecological setting, avoiding the selection biases of patient cohorts recruited to studies based on population-restricting inclusion and exclusion criteria. We also believe the use of a standard checklist for a structured 1-year follow-up patient interview by a limited number of physicians reduces the possibilities of misunderstanding and misinterpreting patient POP symptoms and signs.

Our study has some inherent limitations. Subjective symptoms registered at the 1-year clinical outpatient control may vary according to the patient's personal evaluation, meaning that symptoms interpreted by some patients as minor will by others be described as severe. In addition, it has previously been suggested that doctors tend to underestimate the patient's bother due to an eagerness of favorably interpreting results from self-accomplished surgery (or at least surgery in their own department). There was no blinding of the doctor performing the 1-year follow-up in regard to patient preoperative evaluation, and some 1-year follow-up interviews and objective evaluations were accomplished by the doctor who performed the surgery [27, 28].

To date there is no consensus or agreement in the literature as to whether subjective or objective results should be the basis for evaluation of surgical procedures, making it difficult to compare studies. Some studies report anatomical findings, whereas others report results according to quality-of-life questionnaires. One could also debate whether POP surgery should be viewed as successful when patients report symptom improvement or whether or not success criteria should include a complete remission of symptoms. Our view is that the patient's perception of symptoms must be the most important outcome, as the indication for POP surgery primarily is subjective distress. However, as a measure of objective success, it is also important to communicate

anatomic changes, which may also promote an understanding of why symptom improvement is or is not obtained. We therefore included both subjective and objective criteria for success in our postoperative evaluation [8, 9]. The slight but linear increase in POP reoperation rate found in our study over the postoperative years indicates that long-term follow-up is necessary when evaluating different types of POP repair.

From this nonrandomized population-based study, we conclude that native tissue repair for POP entails low reoperation rates and high patient satisfaction when carried out in a dedicated urogynecological unit. Based on our findings, we postulate that excellent long-term subjective and objective outcomes after native tissue POP repair are feasible in any unit performing POP repair. We believe there are fewer indications for synthetic mesh implants than advocated during the last decade, as results from properly performed native tissue repairs are excellent. Another advantage of native tissue repair over mesh use in POP repair is the substantial difference in operative material cost.

In conclusion, we strongly advocate that a unit in charge of POP repair should provide extensive training in classic anatomical POP repair techniques using native tissue in order to provide patients with a low-cost treatment option that has well-documented excellent long-term results and low risk for long-term complications.

Conflicts of interest S.H. Oversand: None.

A.C. Staff: None.

A.E. Spydslaug has received speaker fees and served as paid consultant for Pfizer.

R. Svenningsen has received speakers fees from Astellas. Travel grants from Pfizer, Astellas, Johnson & Johnson and Boston Scientific.

E. Borstad has received speakers fees from Pfizer, Astellas, and Lilly, and served on Advisory boards for Astellas and Lilly.

Funded by the institution.

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