

# To Compare the Effectiveness of Traditional Anterior Colporrhaphy, Posterior Colpoperineorrhaphy with Site-specific Anterior and Posterior Repair for Pelvic Organ Prolapse

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## ABSTRACT

**Background:** Pelvic organ prolapse (POP) is a common health problem affecting 40% multiparous women above 35 years of age. Lifetime risk of women requiring surgery for recurrence is 10%. The POP is intricate due to complex pelvic anatomy, and difficulty increases due to tissue weakness, lack of evidence-based surgical guidelines, and lack of standardized definition for surgical success, which results in highly variable estimates of success.

**Aim:** To compare the effectiveness of traditional anteroposterior repair with site-specific repair with concomitant vaginal hysterectomy with respect to anatomical considerations by POP-Q and functional or symptomatic considerations, complications, duration of surgery, and recurrence.

**Materials and methods:** This hospital-based randomized controlled trial was carried out at a tertiary care hospital from January 1, 2013 to December 31, 2015 over a period of 3 years after obtaining ethical committee approval. All women attending the gynecological outpatient department having symptoms of mass coming out of vagina were subjected to detailed history and examination and 51 women underwent traditional anterior and posterior repair and 44 women underwent site-specific repair with concomitant hysterectomy, with random sampling according to computerized sheet. The effectiveness of both the surgeries was assessed and compared.

**Observations:** There was statistically significant improvement in all the sites of POP-Q points using traditional repair and site-specific repair. When compared, site-specific repair by POP-Q was better than traditional method.

**Conclusion:** Site-specific repair of decussated natural tissue has great curative potential, and success is attributable to site-specific repair, rather than nonspecific scar formation by traditional method. Thus, it is important to properly quantify the repair to be done, whether anterior or posterior, and perform site-specific repair.

**Keywords:** Pelvic organ prolapse, Site specific repair, Traditional repair.

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## INTRODUCTION

Pelvic organ prolapse is a common health problem affecting 40% multiparous women above 35 years of age, and the lifetime risk of women requiring surgery for recurrence of POP is 10%.

Pelvic organ prolapse affects psychological aspects, sexual behavior and, thus, quality of life. Etiology is thought to be multifactorial for POP. The treatment has evolved from antiquity to today. Women with symptomatic POP have bladder, bowel discomfort, as well as problems with sexual function. Reconstructive surgery for women with prolapse consists of some combination of resuspension of the vaginal apex and anterior and posterior vaginal walls. The choice of a primary surgical procedure for women with POP depends upon a variety of considerations, including the anatomic site of prolapse, presence of urinary or fecal incontinence, health status, and patient preferences.

The POP is intricate due to complex pelvic anatomy, and difficulty increases with time and tissue weakness; absence of evidence-based surgical guidelines and lack of standardized definition for surgical success result in highly variable estimates of success.

This has significant impacts on the ability to conduct, compare, and contrast clinical research in this area. Success of any reconstructive surgery depends on functional resolution of symptoms and anatomic resolution (in operated and unoperated compartments).<sup>1</sup>

Even today, there are no evidence-based guidelines to advice clinicians which surgical intervention to choose, thus letting the clinician in a quandary.

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## AIMS AND OBJECTIVES

To compare the effectiveness of traditional anteroposterior repair with site-specific repair with concomitant vaginal hysterectomy with respect to anatomical considerations by POP-Q and functional or symptomatic considerations, complications, duration of surgery, and recurrence.

## MATERIALS AND METHODS

This hospital-based randomized controlled trial was carried out at a tertiary care hospital from January 1, 2013 to December 31, 2015 over a period of 3 years after obtaining ethical committee approval. All women attending gynecological outpatient department having symptom of mass coming out of vagina were subjected to detailed history pertaining to demographic data, duration of prolapse, urinary symptoms as urgency, frequency, stress urinary incontinence, bowel symptoms as incomplete evacuation of bowel, dyspareunia, etc., affecting quality of life.

Detailed obstetric history mentioning parity, frequency of childbirth, duration of labor, baby size, instrumentation, and postpartum rehabilitation was asked for.

Menstrual history, family history of prolapse, history of precipitating factors as chronic cough, constipation, and mass in abdomen were also asked for. After thorough general examination, per abdomen, cardiovascular system, and respiratory system examination, detailed local examination was done to know the level of vaginal prolapse, stage of prolapse, and thus the deficiency was assessed by per speculum, per vaginum, and per rectal examinations and POP-Q staging.

Women with POP were subjected to investigations and surgery was decided depending on the age, level, compartment, and the stage of prolapse.

The surgery was done by two surgeons of the same experience and skill.

Type of surgery (vaginal hysterectomy with traditional anteroposterior repair and site-specific repair) to be done for women with POP was selected by block randomization (computerized sheet). Totally, 44 women underwent site-specific repair and 51 women underwent traditional method.

Anterior site-specific repair was according to the central, lateral, transverse defects in pubovesicovaginal fascia; posterior defects were classified as detachment of uterosacrals from rectovaginal septum, detachment of perineal body, and tears in rectovaginal septum.

Following observations were made for effectiveness of surgery by comparison of preoperative and postoperative POP-Q and duration of surgery; complications, such as hemorrhage, injury to bladder and bowel, infection, and secondary hemorrhage were also looked for.

After the completion of the surgery, the effectiveness was judged by anatomical consideration of all nine points of POP-Q, and functional efficacy was judged by asking regarding relief of symptoms by a structured validated questionnaire.

Anterior colporrhaphy is plication of fibromuscular layer of vagina to reduce prolapse and support bladder. Posterior colpoperineorrhaphy is plication of fibromuscular layer with inclusion of levator ani and repair of introitus by plication of superficial muscles to perineal body.

Site-specific repair is identification of defect in pubocervical fascia and tear in rectovaginal septum, decussation, and tearing of uterosacrals from perineal body and suturing the torn native tissue.

Women were kept under follow-up for 1 year. Anatomical success was defined if the descent of point c or vault was stage 0 or stage I. Appearance of bothersome symptoms and clinical descent of vault more than stage II after 6 months was labeled as treatment failure and retreatment options were advised, done, and their outcome was noted.

### Inclusion Criteria

- All women with POP in reproductive, perimenopausal, and postmenopausal age groups.
- Women with prolapse willing for follow-up.

### Exclusion Criteria

- Women with POP unfit for surgery.
- Women wanting conservative treatment.

Statistical analysis was done by sample statistics using paired and unpaired "t" testing using EP1 INFO software version 6, level of significance = 0.05.

## OBSERVATIONS

In the present study, the mean age of women in traditional repair was 51.41 years and in the site-specific repair group, it was 49.84 years. Most of the women were para 3 and more in both the groups [S—19/44(32.2%), T—35/51(64.8)] and had level II stage III, IV POP [S—III—46.7%, IV—45.0%; T—III—53.3%, IV—55%]; multicompartiment defect was predominant feature in both the groups.

There was statistically significant improvement in all the sites of POP-Q points using traditional repair (Table 1).

There was statistically significant improvement in all the sites of POP-Q points using site-specific repair (Table 2).

Except for total vaginal length, all the POP-Q points showed statistically significant improvement anatomically when traditional method of repair was used for treatment

**Table 1:** Effectiveness of traditional repair of POP

		Paired sample statistics (traditional) n = 44				
		Mean	Standard deviation	Standard error mean	t-value	p-value
Pair 1	POP-Q preoperative in cm Aa	1.91	0.984	0.148	22.02	<0.001
	POP-Q postoperative anatomical Aa	-2.32	0.883	0.133		
Pair 2	POP-Q preoperative in cm Ba	3.43	1.265	0.191	23.98	<0.001
	POP-Q postoperative anatomical Ba	-1.59	0.726	0.109		
Pair 3	POP-Q preoperative in cm C	3.80	1.407	0.212	33.56	<0.001
	POP-Q postoperative C	-4.43	0.789	0.119		
Pair 4	POP-Q preoperative in cm Ap	0.98	10.607	0.242	12.02	<0.001
	POP-Q postoperative anatomical Ap	-2.27	0.845	0.127		
Pair 5	POP-Q preoperative in cm Bp	1.11	1.895	0.286	8.62	<0.001
	POP-Q postoperative anatomical Bp	-1.55	0.504	0.076		
Pair 6	POP-Q preoperative in cm D	-1.42	2.913	0.444	11.65	<0.001
	POP-Q postoperative anatomical D	-7.00	1.000	0.152		
Pair 7	POP-Q preoperative in cm TVL	7.93	1.087	0.164	-2.11	0.040
	POP-Q postoperative anatomical TVL	8.34	0.834	0.126		
Pair 8	POP-Q preoperative in cm PB	3.10	1.015	0.153	-2.71	0.009
	POP-Q postoperative anatomical PB	3.56	0.497	0.075		
Pair 9	POP-Q preoperative in cm Gh	4.74	0.332	0.050	-4.15	0.000
	POP-Q postoperative anatomical Gh	4.98	0.151	0.023		

TVL: Total vaginal length; AaBa: Anterior points on vaginal wall; ApBp: Points on posterior vaginal wall; C: Cervix; D: Pouch of douglas; Pb: Perineal body; Gh: Genital hiatus

**Table 2:** Effectiveness of traditional repair of POP

		Paired sample statistics (SSR)				
		Mean	Standard deviation	Standard error Mean	t-value	p-value
Pair 1	POP-Q preoperative in cm Aa	1.90	0.964	0.135	29.58	<0.001
	POP-Q postoperative anatomical Aa	-1.94	0.881	0.123		
Pair 2	POP-Q preoperative in cm Ba	3.18	1.228	0.172	22.71	<0.001
	POP-Q postoperative anatomical Ba	-1.18	0.654	0.092		
Pair 3	POP-Q preoperative in cm C	3.82	1.090	0.153	35.02	<0.001
	POP-Q postoperative C	-3.41	1.388	0.194		
Pair 4	POP-Q preoperative in cm Ap	0.88	1.291	0.181	12.99	<0.001
	POP-Q postoperative anatomical Ap	-1.80	0.849	0.119		
Pair 5	POP-Q preoperative in cm Bp	1.06	1.748	0.245	9.16	<0.001
	POP-Q postoperative anatomical Bp	-1.27	0.451	0.063		
Pair 6	POP-Q preoperative in cm D	-1.12	2.776	0.389	8.44	<0.001
	POP-Q postoperative anatomical D	-5.37	3.033	0.425		
Pair 7	POP-Q preoperative in cm TVL	8.10	0.964	0.135	-2.02	0.049
	POP-Q postoperative anatomical TVL	8.43	1.204	0.169		
Pair 8	POP-Q preoperative in cm PB	3.16	1.062	0.150	-3.807	<0.001
	POP-Q postoperative anatomical PB	3.75	0.420	0.059		
Pair 9	POP-Q preoperative in cm Gh	4.75	0.379	0.053	-3.20	<0.001
	POP-Q post-op anatomical Gh	4.94	0.238	0.033		

TVL: Total vaginal length; AaBa: Anterior points on vaginal wall; ApBp: Points on posterior vaginal wall; C: Cervix; D: Pouch of douglas; Pb: Perineal body; Gh: Genital hiatus

of POP as compared with site-specific repair. The site-specific repair is a better method of repair for POP (Tables 3 and 4).

Functional improvement in quality of life by improvement in symptoms was seen in women who underwent site-specific repair (29/44; 65.90%) than traditional repair (28/51; 54.90%) (Table 5).

There was no statistically significant variation in time required (T=77.31 minutes, S=81.34 minutes) for doing both types of surgeries (Table 6).

Complications, such as primary hemorrhage, infection postoperatively of the vault, injury to bladder was seen

in only 3/95 women who underwent any type of repair for prolapse.

Recurrence (vault prolapse) was seen in 4/51 (7.84%) women who underwent traditional repair and in 2/44 (4.54%) who underwent site-specific repair for POP. Totally, 4 women with vault prolapse were treated by abdominal sacrocolpopexy and 2 women underwent high uterosacral ligament suspension.

**DISCUSSION**

The anatomic and functional success of site-specific repair of anterior and posterior vaginal wall prolapse was



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**Table 3:** Comparison of traditional repair and site-specific repair of POP (preoperative)

	Group	n	Group statistics (preoperative)				
			Mean	Standard deviation	Standard error mean	t-value	p-value
POP-Q pre-op in cm Aa	T	51	1.90	0.964	0.135	-0.036	00.972
	S	44	1.91	0.984	0.148		
POP-Q pre-op in cm Ba	T	51	3.18	1.228	0.172	-0.997	0.322
	S	44	3.43	1.265	0.191		
POP-Q pre-op in cm C	T	51	3.82	1.090	0.153	0.109	0.913
	S	44	3.80	1.407	0.212		
POP-Q pre-op in cm Ap	T	51	0.88	1.291	0.181	-0.319	0.75
	S	44	0.98	1.607	0.242		
POP-Q pre-op in cm Bp	T	51	1.06	1.748	0.245	-0.147	0.884
	S	44	1.11	1.895	0.286		
POP-Q pre-op in cm D	T	51	-1.12	2.776	0.389	0.381	0.704
	S	44	-1.34	2.925	0.441		
POP-Q pre-op in cm TVL	T	51	8.10	0.964	0.135	0.790	0.432
	S	44	7.93	1.087	0.164		
POP-Q pre-op in cm PB	T	50	3.16	1.062	0.150	0.92	0.789
	S	44	3.10	1.015	0.153		
POP-Q pre-op in cm Gh	T	51	4.75	0.379	0.053	0.088	0.930
	S	44	4.74	0.332	0.050		

TVL: Total vaginal length; AaBa: Anterior points on vaginal wall; ApBp: Points on posterior vaginal wall; C: Cervix; D: Pouch of douglas; Pb: Perineal body; Gh: Genital hiatus

**Table 4:** Comparison of traditional repair and site-specific repair of POP (postoperative)

	Group	n	Group statistics (postoperative)				
			Mean	Standard deviation	Standard error mean	t-value	p-value
POP-Q post-op anatomical Aa	T	51	-1.94	0.881	0.123	2.077	0.041
	S	44	-2.32	0.883	0.133		
POP-Q post-op anatomical Ap	T	51	-1.80	0.849	0.119	2.689	0.008
	S	44	-2.27	0.845	0.127		
POP-Q post-op C	T	51	-3.41	1.388	0.194	4.308	0
	S	44	-4.43	0.789	0.119		
POP-Q post-op anatomical Ba	T	51	-1.18	0.654	0.092	2.927	0.004
	S	44	-1.59	0.726	0.109		
POP-Q post-op anatomical Bp	T	51	-1.27	0.451	0.063	2.767	0.007
	S	44	-1.55	0.504	0.076		
POP-Q post-op anatomical TVL	T	51	8.43	1.204	0.169	0.419	0.676
	S	44	8.34	0.834	0.126		
POP-Q post-op anatomical PB	T	51	3.75	0.417	0.058	2.114	0.037
	S	44	3.56	0.497	0.075		
POP-Q post-op anatomical D	T	51	-5.37	3.033	0.425	3.365	0.001
	S	43	-7.00	1.000	0.152		
POP-Q post-op anatomical Gh	T	51	4.94	0.238	0.033	-0.868	0.388
	S	44	4.98	0.151	0.023		

TVL: Total vaginal length; AaBa: Anterior points on vaginal wall; ApBp: Points on posterior vaginal wall; C: Cervix; D: Pouch of douglas; Pb: Perineal body; Gh: Genital hiatus

**Table 5:** Comparison of traditional repair and site-specific repair of POP in terms of functional improvement of symptoms and quality of life by validated questionnaire

Functional improvement yes/no *Group cross-tabulation					
	n	Count	Group		Total
			S	T	
Functional improvement yes/no	n	Count	15	23	38
		% within functional improvement yes/no	39.5%	60.5%	100.0%
y	y	Count	29	28	57
		% within functional improvement yes/no	50.9%	49.1%	100.0%
Total	Total	Count	44	51	95
		% within functional improvement yes/no	46.3%	53.7%	100.0%



**Table 6:** Comparison of time required for traditional repair and site-specific repair of POP

	Group statistics						
	Group	n	Mean	Standard deviation	Standard error mean	t-value	p-value
Time in minutes for surgery	T	51	77.31	16.948	2.373	-1.33	0.186
	S	44	81.34	14.916	2.275		

**Table 7:** Comparison of success rate of traditional anterior colporrhaphy with our study

Authors	Number	Follow-up	Success rate (%)
Stanton et al <sup>9</sup>	54	2 years	85
Macer <sup>10</sup>	109	5–20 years	80
Walter et al <sup>11</sup>	76	1.2 years	100
Porges and Smilen <sup>12</sup>	388	2.6 years	97
Colombo et al <sup>13</sup>	33	8–17 years	97
Sand and Koduri <sup>4</sup>	70	1 year	66
Weber and Walters <sup>3</sup>	57	23 months	57
Our study	51	6 months	89.24

**Table 8:** Comparison of success rate of site-specific anterior repair with our study

Authors	Number	Follow-up	Success rate (%)
White <sup>6</sup>	19	3 years	100
Shull et al <sup>7</sup>	62	0.6 years	67
Grody et al <sup>14</sup>	72	0.5–3 years	99
Elkins et al <sup>15</sup>	25	0.5–3 years	92
Mallipeddi et al <sup>8</sup>	45	0.6 years	97
Young et al <sup>16</sup>	100	11 months	78
Morse et al <sup>17</sup>	27	13 months	54
Ours	44	6 months	90.91

better compared with traditional method of repair after 6 months, indicating that site-specific repair by vaginal route is a better operative procedure as compared with traditional method.

Though the size of our patient sample was small, the study was designed to minimize the confounding surgical factors including surgeon, type of surgery, and sites of prolapse. The study group was limited to women with combined prolapse of the three compartments (complex). The degree of prolapse is of less significance for an experienced surgeon. It is always better to do concomitant hysterectomy with apical prolapse.

Cystocele can be a paravaginal defect (lateral, displacement), midline defect (central, distention), or transverse defect (apical) when the pubocervical fascia separates from the vaginal cuff or uterosacral ligaments or both.

Kelly<sup>2</sup> in 1913 described anterior colporrhaphy with the success rates of 80 to 100% in the management of cystoceles. As per evidence-based medicine, the results vary considerably for anterior colporrhaphy. In two randomized controlled trials, by Weber and Walters<sup>3</sup> and Sand and Koduri,<sup>4</sup> they reported less favorable outcomes with the anterior colporrhaphy, 42 and 57% respectively.

In 1976, Richardson and Lyon<sup>5</sup> modified the paravaginal repair originally described by White<sup>6</sup> as early as 1912. Studies have reported that the range of success rate for the paravaginal repair is 75 to 97%. Though this technique can be done laparoscopically, no efficacy information is available. Prof Shull et al<sup>7</sup> reported the safety and efficacy of the vaginal paravaginal repair in 1994, and various case series have reported success rates between 67 and 100%. The high success rates have been associated with complications too. Mallipeddi et al<sup>8</sup> in their case series of 45 patients reported one bilateral ureteric obstruction, one retropubic hematoma requiring surgery, and two

transfusions. Tables 7 and 8 show the comparison of various studies with ours.

The success rate of traditional anterior repair for anterior wall prolapse in our study correlates well with other studies.

Site-specific anterior repair was successful in 90.91% of women with POP when followed up for 6 months. This is in accordance with other studies. Totally, seven women underwent concomitant transobturator tape (TOT) surgery for associated stress urinary incontinence. A total of three women were in traditional repair group and four in site-specific repair group. Separate incision was taken for TOT when it was accompanied with anterior repair as studies mention that for any infection of colporrhaphy wound, it can lead to infection at the TOT site leading to failure of the procedure. We did not find any problem while doing concomitant TOT with anterior colporrhaphy taking separate incisions.

Rectoceles can be low, midvaginal, or high depending on the defect. High rectocele is the result of defects in the cardinal/uterosacral ligament complex. Midvaginal rectocele is caused by the weakening or detachment of the rectovaginal fascia from the arcus tendineus fasciae pelvis. Separation of the perineal body at the level of the rectovaginal fascia results in perineal descent or a low rectocele. Rectocele can be also according to the tearing portion of rectovaginal fascia: Lateral defect, central defect, apical defect, and perineal defect. Richardson identified various defects in rectovaginal fascia and directed repair at the specific sites of defect to produce a more anatomical repair.<sup>5</sup> Studies on the site-specific defect repair have reported success rates in the range of 67 to 92% with good functional outcomes.

On following up the women with posterior repair by traditional method for 6 months, the success rate was 82.28%, which is comparable with other studies (Table 9).

**Table 9:** Comparison of success rate of traditional posterior colpoperineorrhaphy with our study

Author	Number	Follow-up	Success (%)
Kahn and Stanton <sup>18</sup>	171	43 months	76
López et al <sup>19</sup>	24	5 years	91
Arnold et al <sup>20</sup>	29	4 years	77
Mellgren et al <sup>21</sup>	25	1 year	96
Maher <sup>22</sup>	38	1 year	97
Singh et al <sup>23</sup>	42	18 months	92
Robinson et al <sup>24</sup>	34	41 months	33
Our study	51	6 months	82.28

**Table 10:** Comparison of success rate of site-specific posterior repair with our study

Author	Number	Follow-up	Success (%)
Abramov et al <sup>25</sup>	124	14 months	67
Cundiff et al <sup>26</sup>	69	12 months	82
Kenton et al <sup>27</sup>	66	12 months	77
Porter et al <sup>28</sup>	89	18 months	82
Paraiso et al <sup>29</sup>	37	17 months	78
Our study	44	6 months	86.37

The success rate of site-specific posterior repair was 86.37% when the women were followed up for 6 months (Table 10).

Concomitant hysterectomy at the time of POP repairs is the standard practice in most parts of the world despite the fact that descent of the uterus may be a result, not a cause of POP. However, concomitant hysterectomy is not an evidence-based practice. Suspension of the apex by an appropriate method should be considered at the time of each vaginal prolapse repair. In this study, concomitant hysterectomy was done in all women with vault suspension by McCall's method.

There are two totally different opinions about the treatment of POP. Von Theobald<sup>30</sup> described POP as a disease of the connective tissue, and not an illness of the uterus, and hysterectomy does not cure the prolapse.

In the patient information leaflet of the British Society of Urogynaecology, there is information that the most common operation for uterine prolapse is a vaginal hysterectomy<sup>31</sup> and 93% of the International Urogynecological Association members opted for this method. Prolapse repair for asymptomatic women at the time of other pelvic surgery is a reasonable option in women with advanced prolapse (stages 3 or 4) or risk factors for prolapse progression (e.g., concomitant hysterectomy, premenopausal status, obesity).

Concomitant hysterectomy increases the risk of some perioperative complications (e.g., mesh erosion). Repairs of only anterior or posterior prolapse have a higher failure rate than when these procedures are combined with apical prolapse repair. This was illustrated in the US national study of 2,756 women and found the following 10-year reoperation rates: Anterior repair *vs* combined anterior and apical repair (20.2 *vs* 11.6%); anterior and posterior repair *vs* combined anterior, posterior, and apical repair (14.7 *vs* 10.2%); and posterior repair *vs* combined posterior and apical repair (14.6 *vs* 12.9%).

## CONCLUSION AND RECOMMENDATIONS

Site-specific repair of torn native tissue has genuine curative potential, and success is attributable to site-specific

repair, rather than nonspecific scar formation by traditional method.

This article gives two guidelines for pelvic reconstructive surgeons:

(1) The pathogenesis of cystocele is fascial tears at top and side, as the vaginal suspensory hammock is avulsed from the pelvic sidewall during vaginal delivery.

Traditional anterior colporrhaphy is a quicker and simpler operation, but does not cure the actual sites of anatomic damage, though cystocele plication is helpful in a proportion of patients, presumably through the formation of a nonspecific scar plate beneath the vesical neck and bladder.

(2) Thus, it is important to properly quantify the repair to be done, whether anterior or posterior, and perform site-specific repair.

During posterior traditional repair, levator ani plication between the rectum and vagina has been implicated as a possible etiology for sexual dysfunction after standard posterior colporrhaphy.

So, omission of levator plication should be considered when unnecessary.

The knowledge about the reasons and mechanisms of POP is insufficient, which leads to completely different opinions about its treatment. Nevertheless, the amount of studies concerning the evaluation and the treatment of POP ensures that the quality of care provided to women with urogynecological problems is continuously increasing.

Anatomical as well as functional cure is important as it deals with concerned symptoms of vaginal bulge; anatomical POP-Q stage of I or O in the apical compartment is acceptable and is widely used as the optimum postoperative result.

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