

The incidence of reoperation for surgically treated pelvic organ prolapse: an 11-year experience

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Abstract

Objective

The purpose of this study was to measure the rate of re-operation for surgically treated pelvic organ prolapse.

Study Design

An 11-year retrospective audit was conducted of women who had undergone surgery for pelvic organ prolapse between 1995 and 2005 in a large teaching hospital in the UK.

Main outcome measures

Variables examined included the type of primary procedure for pelvic organ prolapse overall and per year, the type of the repeat procedure and the interval between primary and repeat procedures. Analysis included calculation of the number and proportion of primary operations, the rate of re-operation, the type of repeat prolapse operation, and the cumulative risk of re-operation each year for 11 years.

Results

During the study period, 2099 women underwent surgery for pelvic organ prolapse. Of these women, 142 underwent a second operation for prolapse and 13 a third. The overall cumulative rate of re-operation following surgery for pelvic organ prolapse was 10.8% at 11 years following the initial procedure.

The majority (61.5%) of repeat procedures did not involve the same compartment as the initial operation and recurrences tended to occur in the first few years after the first operation.

Conclusions

Women who undergo surgery for pelvic organ prolapse are at 10.8% risk of requiring a re-operation within the next 11 years, usually at a different site.

Introduction

As the population ages, an increasing number of women will present to health care providers with pelvic floor disorders. The most common of these being prolapse, which has been shown to affect 30-50% of parous women (1;2). It is known that the incidence of pelvic organ prolapse increases with age. In the Women's Health Initiative Hormone Replacement Therapy randomized clinical trial, 270 women with an average age of 68 years were examined using the POP-Q test at recruitment and after three years. The incidence of prolapse defined as the leading edge at or below the hymeneal ring, was 25.2%. Over the three year period prolapse was found to regress and progress, with the rates of progression greater than regression(3;4).

Conservative treatments, such as pessaries, have traditionally been used to treat prolapse in the elderly. Women are however living much longer and leading more active lifestyles and are reluctant to use them in the long term. Surgery, which is the only real definitive treatment for prolapse, has been made safer by advances in surgical techniques and anaesthesia. Because of this, it is extremely rare for the very elderly to be considered truly unfit for surgery, and it has been estimated that 11.5% of women will have surgery for prolapse at some point in their lives (5).

One of the most challenging problems facing specialists in managing women with prolapse is recurrence following surgery. It is difficult to estimate the true incidence of recurrence but rates of repeat surgery have been reported, ranging

from 10-30% (5-8). These studies however tend only to look into the incidence of recurrence and repeat surgery and not into the anatomical site of the recurrence. Most studies also have looked only at the number of women in a cohort who are undergoing repeat surgery, rather than following a group of women over a period of time. The studies that have followed women over time have looked at small numbers over periods of time up to 6 years.

All studies looking into re-operation for pelvic organ prolapse underestimate the true incidence of recurrence, as many women will chose conservative treatments or just live with their symptoms after unsuccessful surgery.

Recurrence of prolapse after surgery may result from direct surgical failure. It also often occurs because prolapse is a global pelvic floor phenomenon and is a reflection of weak endopelvic connective tissue rather than a specific defect(9). With more elderly women undergoing surgery for pelvic organ prolapse, it is important to be able to give them reliable information as to the risks of requiring further surgery for recurrent prolapse in the future.

The aim of our study was therefore to evaluate the rate of re-operation following surgery for pelvic organ prolapse and to evaluate the risks of recurrence of prolapse following surgery to the anterior, posterior and apical compartments. We have carried this out by performing a retrospective audit of prolapse surgery in a substantial cohort of women over a period of 11 years.

Study Design and Methods

Using the hospital's electronic record system, we identified a cohort of women who underwent surgical treatment for pelvic organ prolapse between January 1995 and December 2005 in the John Radcliffe Hospital, Oxford, UK.

The records were examined and operations were classified according to the compartment or compartments that were addressed in surgery: anterior, posterior and apical. Women who subsequently went on to have repeat surgery for prolapse were identified and information regarding their first and subsequent operations and the time interval between them were collected.

These data were then analysed and calculation of the number and type of primary procedures, the rate of re-operation, the type of repeat surgery and the cumulative risk of re-operation each year for 11 years was carried out.

In order to take into account the effect of population movement on these figures, data on population migration, during the period of the study, was identified from the NHS Central Register and used to calculate a single mean rate for outward migration of women aged 35-75 from the area (10;11). The data was adjusted by reducing the number of primary operations by the percentage of population migration, which had the effect of removing from the study those women who would have moved out of the area or died after the first operation.

Results

Primary Procedures

During the 11 year period, 2099 women at the John Radcliffe Hospital underwent a primary surgical procedure for pelvic organ prolapse. The surgical procedures were grouped into the broad categories of anterior repair (AR), posterior repair (PR), and repair of apical prolapse (Apex). The operations were carried out by 11 surgeons, who were primarily general consultant obstetricians and gynaecologists or specialist registrars working under their direct supervision. The numbers of each procedure carried out during each year are shown in table 1.

Repeat procedures

Out of the 2099 women undergoing primary prolapse surgery, there were 142 who had a second operation for prolapse during the 11 year time period. Table 2 shows the time interval between these procedures for those women who had a repeat operation. Out of these 142 women there were 13 who had a third operation and one who had a fourth operation during the same period.

Analysis of results

The raw data on repeat procedures was analysed, allowing calculation of the number of women who underwent a second operation during each year following their initial operation. This allowed us to calculate the incremental re-operation rates for each year after the initial procedure. These incremental rates were then added together to give a cumulative reoperation rate for each period (eg 1-11 years) after the initial procedure (Table 3). These data were then adjusted to take into account the number of women who may have migrated from the area after their first operation and been lost to the study. Outward migration of the study population was estimated, using regional population migration information on the NHS Central Register, to be at a rate of 1.29% per year. This was applied to the data to derive adjusted figures for the numbers of primary procedures. (Table 4).

Table 5 lists and analyses the 142 cases of repeat surgery (a second operation) for pelvic organ prolapse. The cases are grouped in a matrix according to the type of primary surgical procedure and subsequent surgery. For each type of primary procedure, the contribution to the overall workload of secondary procedures was calculated as a percentage. The 142 cases were analysed further, according to whether or not the repeat surgery occurred in the same anatomical department as the initial operation. This showed:

- For women having an initial anterior repair, $93/(533+885) = 6.5\%$ required repeat operations, of which 36/93 (39%) involved repeat anterior repairs.
- For women having an initial posterior repair, $70/(533 + 523) = 6.6\%$ required repeat operations, of which 28/70 (40%) involved repeat posterior repairs.
- For women having an initial procedure for apical prolapse, $11/129 = 8.5\%$ required repeat operations, of which 3/11 (27%) involved repeat repair on the apex.
- For women having an initial procedure in any anatomical compartment, $142/2099 = 6.8\%$ required repeat operations, of which 67/174 (38.5%) involved repeat surgery on the same compartment.

Discussion

One of the key findings of this study is that, in our population of women, the risk of undergoing a second operation for urogenital prolapse is 10.8% within the first eleven years following the first operation. The rate of re-operation was highest in the first few years after the initial operation, with over half of the re-operations occurring within the first three years. It should be noted that the re-operation rate was still rising at 11 years and we would expect it to continue to increase over time and our report may underestimate the total number of re-operations that this cohort may ultimately experience.

An adjustment for population migration was necessary because over a study period of eleven years, some women will have moved out of the area and will have been lost to follow up, giving an underestimate of the rates of re-operation. Consideration of the age range of the sample was necessary, since population migration is age sensitive (12). This method of correction for population migration, although approximate, is considered reasonable, since the migration rate was low and did not vary significantly over the study period. Using this approach, the overall effect of adjustment for population migration was to increase the cumulative re-operation rate after 11 years from 10.2% to 10.8%.

The recurrence of prolapse in individual compartments of the vagina is not well understood. The anterior vagina is commonly regarded as the site that is most

prone to recurrent prolapse. However, in our study the results over 11 years show that 6.5% of women having an initial anterior repair and 6.6% of women having an initial posterior repair required repeat surgery. Posterior repair therefore appears to be just as prone as anterior repair at failing.

Surgery involving the anterior compartment was the most common initial procedure. It should be noted, however, that 61% of recurrences in this group actually occurred in a compartment other than the anterior one and the most common repeat operation amongst the whole cohort was posterior repair. The findings for anterior repair are also mirrored in the other pelvic compartments, with only 38.5% of initial procedures involving any compartment being followed by a repeat procedure involving the same compartment.

It is a common assumption that recurrence of prolapse occurs in the same compartment as the initial operation. Our findings contradict this and, in our study population, recurrences are more likely to be found in a different compartment than the initial operation. This adds weight to the suggestion that prolapse recurrence is not always a result of surgical failure but can result from the failure of surgery to address the underlying causes of pelvic organ prolapse. The choice of operation in the first instance depends on correct identification of the support problem at the pre-operative evaluation. Also the repair of one vaginal compartment may predispose another compartment to the development of

prolapse, as exemplified by the occurrence of enterocele after sacrocolpopexy or cystocele after sacrospinous fixation.

We would like to point out that our study deliberately excluded consideration of vaginal hysterectomy performed at the time of surgery for uterovaginal prolapse. This was mainly to avoid counting the many cases of vaginal hysterectomy that were *not* associated with prolapse but were performed for other reasons, eg menorrhagia. (The hospital records on which this retrospective study was based did not enable us to distinguish between these). Furthermore, although vaginal hysterectomy is still quite commonly carried out concurrently with a prolapse repair, there is a lack of evidence to suggest that hysterectomy improves the outcome of the prolapse surgery (13,14).

The accuracy of our study is dependent on the accuracy of medical coding of procedures and of data entry. Error rates for coding have generally been estimated to be less than 5% for medical coding and less than 0.5% for non-medical data entry (15). Our study is also limited by being observational and retrospective. Definitive cause and effect conclusions cannot be drawn from this type of investigation.

Conclusions

Women who undergo surgery for pelvic organ prolapse are at a 10.8% risk of requiring repeat surgery within the next 11 years. Posterior repair appears to be as prone to anterior repair at failing.

The majority of failures occur within the first three years following the initial operation and, furthermore, repeat surgery will address prolapse in a different compartment from the initial operation in 61.5% of cases. This finding contradicts the common assumption that prolapse recurs in the same compartment and that anterior repair most commonly fails.

Procedure	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
AR + PR	72	55	45	37	47	40	30	38	44	42	83	533
AR	137	86	87	64	76	70	60	55	80	76	94	885
PR*	30	48	33	37	36	42	47	49	73	64	64	523
Apex	4	3	5	5	12	10	13	25	20	19	13	129
Other	2	0	2	3	1	1	2	9	4	4	1	29
Total	245	192	172	146	172	163	152	176	221	205	255	2099

*including enterocele repair

Table 1: Types of first prolapse repair procedure, by year

1st proc.	2nd procedure (no. of years later)											Total
	1	2	3	4	5	6	7	8	9	10	11	
1995	6	2	3	2	0	1	2	3	3	1	1	24
1996	4	5	5	1	2	0	1	2	0	0	X	20
1997	4	3	4	1	3	1	2	1	2	X	X	21
1998	4	2	2	1	2	0	1	1	X	X	X	13
1999	4	6	1	1	0	2	1	X	X	X	X	15
2000	0	5	2	0	0	1	X	X	X	X	X	8
2001	2	2	0	3	1	X	X	X	X	X	X	8
2002	4	4	3	2	X	X	X	X	X	X	X	13
2003	5	9	0	X	X	X	X	X	X	X	X	14
2004	4	1	X	X	X	X	X	X	X	X	X	5
2005	1	X	X	X	X	X	X	X	X	X	X	1
Total	38	39	20	11	8	5	7	7	5	1	1	142

X indicates information not yet available

Table 2: Numbers of second repair procedure, by interval after first procedure

	2nd procedure (no. of years later)										
	1	2	3	4	5	6	7	8	9	10	11
No. of 2nd procedures	38	39	20	11	8	5	7	7	5	1	1
No. of 1st procedures	2099	1844	1639	1418	1242	1090	927	755	609	437	245
Incremental reoperation rate, %	1.8%	2.1%	1.2%	0.8%	0.6%	0.5%	0.8%	0.9%	0.8%	0.2%	0.4%
Cumulative reoperation rate, %	1.8%	3.9%	5.1%	5.9%	6.6%	7.0%	7.8%	8.7%	9.5%	9.8%	10.2%

Table 3: Numbers of procedures and re-operation rates, by interval after first procedure (unadjusted)

	2nd procedure (no. of years later)										
	1	2	3	4	5	6	7	8	9	10	11
No. of 2nd procedures	38	39	20	11	8	5	7	7	5	1	1
No. of 1st procedures	2072	1797	1639	1346	1164	1008	846	680	542	348	212
Incremental reoperation rate, %	1.8%	2.2%	1.3%	0.8%	0.7%	0.5%	0.8%	1.0%	0.9%	0.3%	0.5%
Cumulative reoperation rate, %	1.8%	4.0%	5.3%	6.1%	6.8%	7.3%	8.1%	9.1%	10.0%	10.3%	10.8%

Table 4: Numbers of procedures and re-operation rates, by interval after first procedure (adjusted for population migration)

First procedure	Second procedure						
	AR + PR	AR	PR	SC	Other	Total	%
AR + PR	5	8	10	10	0	33	23.2%
AR	6	17	24	11	2	60	42.3%
PR*	2	17	11	5	2	37	26.1%
SC	1	3	3	3	1	11	7.7%
Other	0	0	0	1	0	1	0.7%
Total	14	45	48	30	5	142	100.0%
%	9.9%	31.7%	33.8%	21.1%	3.5%	100.0%	

*including enterocele repair

Table 5: Analysis of first and second repair procedures

References

- (1) Hendrix SL, Clark A, Nygaard I, Aragaki A, Barnabei V, McTiernan A. Pelvic organ prolapse in the Women's Health Initiative: gravity and gravidity. *Am J Obstet Gynecol* 2002; 186(6):1160-1166.
- (2) Samuelsson EC, Victor FT, Tibblin G, Svardsudd KF. Signs of genital prolapse in a Swedish population of women 20 to 59 years of age and possible related factors. *Am J Obstet Gynecol* 1999; 180(2 Pt 1):299-305.
- (3) Nygaard I, Bradley C, Brandt D. Pelvic organ prolapse in older women: prevalence and risk factors. *Obstet Gynecol* 2004; 104(3):489-497.
- (4) Bradley CS, Zimmerman MB, Qi Y, Nygaard IE. Natural history of pelvic organ prolapse in postmenopausal women. *Obstet Gynecol* 2007; 109(4):848-854.
- (5) Olsen AL, Smith VJ, Bergstrom JO, Colling JC, Clark AL. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. *Obstet Gynecol* 1997; 89(4):501-506.
- (6) Diez-Itza I, Aizpitarte I, Becerro A. Risk factors for the recurrence of pelvic organ prolapse after vaginal surgery: a review at 5 years after surgery. *Int Urogynecol J Pelvic Floor Dysfunct* 2007; 18(11):1317-1324.
- (7) Whiteside JL, Weber AM, Meyn LA, Walters MD. Risk factors for prolapse recurrence after vaginal repair. *Am J Obstet Gynecol* 2004; 191(5):1533-1538.
- (8) Clark AL, Gregory T, Smith VJ, Edwards R. Epidemiologic evaluation of reoperation for surgically treated pelvic organ prolapse and urinary incontinence. *Am J Obstet Gynecol* 2003; 189(5):1261-1267.
- (9) Jackson SR, Avery NC, Tarlton JF, Eckford SD, Abrams P, Bailey AJ. Changes in metabolism of collagen in genitourinary prolapse. *Lancet* 1996; 347(9016):1658-1661.
- (10) National Statistics: Internal migration, Table 8.1. *Population Trends* 2003; 113, 64.
- (11) Internal migration estimates for local and former health authorities in England and Wales, 2001. *Population Trends* 2002; 109: 87-89.
- (12) Chappel R, Vickers L, Evans H. The use of patient registers to estimate migration. *Population Trends* 2000; 101: 19-24.

- (13) Maher CF et al. Uterine preservation or hysterectomy at sacrospinous colpopexy for uterovaginal prolapse? *Int Urogynecol J Pelvic Floor Dysfunct*, 2001; 12(6): 381-4.
- (14) Hefni M et al. Sacrospinous cervicocolpopexy with uterine conservation for uterovaginal prolapse in elderly women : an evolving concept. *Am J ObstetGynecol*, 2003;188(3): 645-50.
- (15) McLemore T, Lawrence L. Plan and operation of the National Survey of Ambulatory Surgery. *Vital Health Statistics*, 1997; 1(1-4): 1-124.