Int Urogynecol J (2014) 25:851–854
DOI 10.1007/s00192-013-2258-9

CASE REPORT

Cervical elongation following sacrospinous hysteropexy: a case series

Momoe Tina Hyakutake · Geoffrey William Cundiff · Roxana Geoffrion

Received: 25 July 2013 / Accepted: 7 October 2013 / Published online: 3 December 2013

Abstract In recent years, pelvic floor surgeons have increasingly repaired pelvic organ prolapse around an intact uterus. Uterine conservation and hysteropexy have been driven by patient preference, less risk of mesh erosion, shorter operative time, and decreased blood loss and postoperative pain. We present a case series of patients with cervical elongation after vaginal sacrospinous hysteropexy using polypropylene mesh arms, a novel technique developed by the senior author. We defined cervical elongation as greater than or equal to a two-fold increase in cervical length compared with preoperative measurements. Of the 8 patients who underwent this procedure, 5 (62.5 %) had cervical elongation during the first year postoperatively. In the most severe case, the cervix extended to 4 cm beyond the hymenal ring. Most of the patients were mildly symptomatic and chose expectant management. The cases are reviewed in detail. A brief literature review on cervical elongation is presented.

Keywords Cervical elongation · Pelvic organ prolapse · Sacrospinous fixation · Uterine conservation

Introduction

Conserving and suspending the uterus for pelvic organ prolapse (POP) surgery has the advantages of shorter operative time, decreased blood loss and less postoperative pain compared with suspension with concomitant hysterectomy [1]. Recent data comparing hysteropexy with apical procedures using mesh also suggest a lower risk of mesh erosion with uterine conservation [2]. Patient attitudes toward uterine conservation are also favorable [3]. In a survey study of 100 women seen for POP, 60 % stated they would decline a hysterectomy if presented with an equally efficacious surgical option; 32 % would decline a hysterectomy unless it offered a "substantial benefit"; and 14 % reported that they would not have a hysterectomy for benign disease regardless of the impact on surgical outcome [3].

The senior author (RG) developed an apical repair that involves suspension of the posterior aspect of the apex to the sacrospinous ligaments bilaterally (bSSVF) using mesh arms tailored to the patients' size and anatomy. This can be performed both with and without a uterus. In the case of uterine conservation, dissection is carried out in the posterior compartment, all the way to the posterior cervix. Dissection is also carried out laterally into the pararectal space. Once the ischial spines and sacrospinous ligaments are identified by palpation, a Capio suture capture device (Boston Scientific, Natick, MA, USA) is used to place a non-absorbable suture through the inferior portion of the sacrospinous ligament, approximately 1–2 cm medial to the ischial spine on each side. Next, two non-absorbable sutures are placed into the underside of the posterior cervix on each side. Using a sheath of Amid type I, soft weave, polypropylene mesh (Gynemesh, Gynecare, Ethicon, Johnson & Johnson, USA), two mesh arms are fashioned, adjusting the width and length to individual pelvic dimensions to avoid tension. The mesh arms are then attached to the underside of the cervix using the previously placed sutures. Finally, the remaining free ends of the mesh are attached to the sacrospinous ligaments by using the previously placed sacrospinous sutures. The aim is to recreate the uterosacral ligaments maintaining minimal tension and to restore nulliparous midline anatomy of the vagina through bilateral attachment [4].

During evaluation of this technique, both with and without uterine conservation, we discovered an unexpected finding of

M. T. Hyakutake (✉) · G. W. Cundiff · R. Geoffrion
Department of Obstetrics and Gynecology, University of British Columbia, St. Paul's Hospital, 1190 Hornby Street, 4th floor, Vancouver, BC, Canada V6Z 2K5
e-mail: momoe.h@gmail.com

significant cervical elongation during the first year postoperatively. We present five such cases.

Case reports

Patients with symptomatic POP from the practices of two urogynecologists (2009–2012) participated in a study investigating outcomes of the experimental bSSVF procedure. Any patient with symptomatic apical compartment prolapse who desired surgical intervention was included in the study. Many patients had multi-compartment prolapse. Eight patients expressed a wish for uterine conservation and vaginal suspension. They were assessed with standard baseline data collection including demographics and staging via pelvic organ prolapse quantification (POPQ). They all underwent bSSVF using the technique described above. Patients were assessed at 6 weeks and 1 year postoperatively. Within the first year postoperatively, we detected five cases of elongation of the cervix. Four of the 5 patients noted a symptomatic bulge, only 1 of whom was bothered by it. We defined cervical elongation as greater than or equal to a two-fold increase in cervical length compared with preoperative measurements. Cervical length was calculated by subtracting point D from point C on POPQ measurements.

In the cervical elongation group, patient mean age was 57.2 years (range 36–75). The mean BMI was 24.7 (range 20–30). Average parity was 2.6 (range 2–4). Only 1 of the 5 patients was a smoker. All patients had normal preoperative pelvic ultrasounds. All patients underwent concomitant native tissue repairs in the anterior and posterior compartments. Three patients were also noted to have paravaginal defects and vaginal paravaginal repair using biomesh (Pelvisoft, Bard, Covington, GA, USA) was performed. Of these 3 patients, 2 had cervical elongation. No mesh erosions occurred. There were no other significant intra- or postoperative complications.

We compared multiple variables between the groups of patients with and without cervical elongation after bSSVF with uterine conservation. These variables include smoking status, age, BMI, parity, number of vaginal deliveries, number of forceps-assisted deliveries, infant size, previous treatment for pelvic organ prolapse, preoperative pelvic ultrasound, preoperative and postoperative local or systemic estrogen use, and pelvic floor muscle strength. None of these parameters showed significant associations with cervical elongation.

Three of the 5 patients were sexually active prior to surgery. Their sexual function did not change despite cervical elongation. The mean time from bSSVF until cervical elongation was 342 days (range 212–419 days). Selected pre- and postoperative patient characteristics are presented in Table 1. Figure 1 is an MRI showing a sagittal view of one of the patients with cervical elongation.

Table 1 Patient characteristics at diagnosis of postoperative cervical elongation

Case	1	2	3	4	5
Time to diagnosis (days)	400	212	419	321	356
Preop C	+1	+4	+1	0	+2
Preop D	0	+2	−1	−2	0
Cervical length	1	2	2	2	2
Cervical length at 6 weeks	3	1	2	3	3
1 year C	+4	−2	0	0	0
1 year D	−4	−6	−8	−8	−5
Cervical length	8	4	8	8	5
Symptoms	Sensation of bulging, denies discomfort	Sensation of bulging, affecting her quality of life	Sensation of bulging, denies discomfort	None	Sensation of bulging
Sexual function	Sexually active	Not sexually active for reasons other than prolapse or incontinence	Information not available	Not sexually active for reasons other than prolapse or incontinence	Sexually active
Management	Expectant	Manchester repair, partial trachelectomy	Expectant	Expectant	Expectant

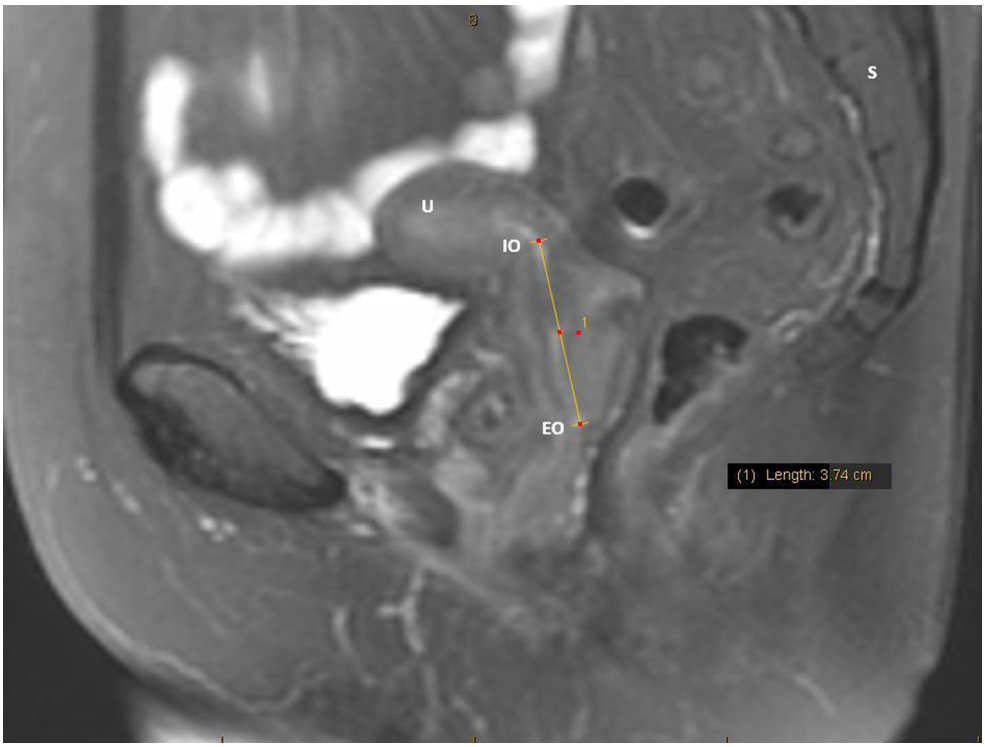

Fig. 1 Sagittal MRI of a patient with cervical elongation after bSSVF. U = uterus; IO = internal cervical os; EO = external cervical os; S = sacrum

Discussion

We present five cases of unexpected cervical elongation post-vaginal sacrospinous fixation with mesh arms, for a cumulative incidence of 62.5 % of initial bSSVF procedures performed with uterine conservation by two urogynecologists.

An MRI study showed that cervical elongation is common in women with POP and can occur in up to 40 % of symptomatic women [5]. The cervix was 8.6 mm longer than in women without POP and cervical elongation was defined as greater than 33.8 mm [5]. All of our patients, including those who did not develop elongation, had cervical lengths less than 3 cm at preoperative assessment. As such, in our cohort of patients, postoperative cervical elongation is not related to pre-existing cervical elongation owing to long standing prolapse.

Methods of uterus-sparing POP surgery include abdominal sacrohysteropexy and vaginal sacrospinous or uterosacral ligament hysteropexy. We were unable to identify any other studies that reported cervical elongation associated with vaginal uterine suspension. In contrast, cervical elongation has been reported with abdominal suspension. Vierhout and Futterer described a case of extreme cervical elongation to 12 cm, 8 years after fixation of the uterine corpus directly to the sacrum [6]. They postulated that inadequate, tensioned fixation high in the pelvis without counter pressure from an adequate pelvic floor resulted in cervical elongation. Our patients had fixation at the location of normal uterosacral ligaments and the mesh was tailored to each patient to ensure that fixation occurred with minimal tension. Therefore, this is unlikely to be the cause of cervical elongation in our case series. Given the high incidence of this complication in our study population, it is curious that an association with sacrospinous hysteropexy has not yet been reported in the literature. A concomitant anterior and posterior colporrhaphy was performed in all of our patients. This is consistent with most other studies of sacrospinous hysteropexy. Given the lack of this complication in other studies, this is not likely to contribute to cervical elongation. In addition, we performed vaginal paravaginal repairs in 3 patients who were also found to have paravaginal defects. By addressing this lateral defect, we postulated that in addition to support in the anterior compartment, this would further strengthen apical support and avoid an imbalance in postoperative pelvic vectors [7]. However, 2 of the 3 patients had cervical elongation, indicating that lack of lateral support is not the cause of cervical elongation either.

A major difference between previously published studies and our study is the surgical method employed. It is possible that bilateral fixation from a posterior approach causes unbalanced forces between the anterior and posterior portions of the cervix in the upright position. This pressure difference may result in cervical elongation over time. A biomechanical model would need to be studied to look at vectors of forces resulting from the bSSVF procedure to investigate this further.

Our case series was too small to identify individual patient risk factors for cervical elongation. A study looking at causes

of hypertrophic cervical elongation found that quantities of elastin, collagen, and smooth muscle did not differ between hypertrophic and non-hypertrophic cervices [8]. However, there was a greater quantity of estrogen and progesterone receptors in hypertrophic cervices than normal. These molecular differences may have existed in our patient population, causing cervical elongation in some patients. Hypertrophic elongation of the cervix may also be a result of tissue reaction to synthetic mesh. Further research is needed to investigate clinical and molecular differences that could explain cervical elongation in patients undergoing bSSVF.

Of the 5 patients with cervical elongation, only 1 patient was surgically managed. She felt bothered by her symptoms of protrusion. Partial trachelectomy was performed to shorten the cervix. Although the uterine fundus was felt to be adequately supported at the time of the partial trachelectomy, we felt that the uterosacral ligaments could be partially compromised or stretched along with cervical elongation; to prevent further POP recurrence and need for reoperation, we performed a concomitant Manchester repair. It is interesting to note that most patients were minimally symptomatic from cervical elongation, even when sexually active. We postulate that adequate apical uterine suspension procures resolution of the discomfort of POP, despite cervical elongation.

Sacrospinous hysteropexy is a relatively new procedure that may cause significant elongation of the cervix. Although most patients are minimally symptomatic within the first year post-hysteropexy, they may become more symptomatic over time and require further surgical intervention.

Consent Written informed consent was obtained from the patients for publication of this case series and any accompanying images.

Conflicts of interest None.

References

1. Zucchi A, Lazzeri M, Porena M, Mearini L, Costantini E (2010) Uterus preservation in pelvic organ prolapse surgery. Nat Rev Urol 7(11):626–633
2. Cvach K, Geoffrion R, Cundiff GW (2012) Abdominal sacral hysteropexy: a pilot study comparing sacral hysteropexy to sacral colpopexy with hysterectomy. Female Pelvic Med Reconstr Surg 18(5):286–290
3. Frick AC, Barber MD, Paraiso MF, Ridgeway B, Jelovsek JE, Walters MD (2013) Attitudes toward hysterectomy in women undergoing evaluation for uterovaginal prolapse. Female Pelvic Med Reconstr Surg 19(2):103–109
4. Nicolau-Toulouse V, Tiwari P, Lee T, Cundiff GW, Geoffrion R (2013) Does bilateral sacrospinous fixation with synthetic mesh recreate nulliparous pelvic anatomy? An MRI evaluation. Female Pelvic Med Reconstr Surg (in press)
5. Berger MB, Ramanah R, Guire KE, DeLancey JO (2012) Is cervical elongation associated with pelvic organ prolapse? Int Urogynecol J Pelvic Floor Dysfunct 23(8):1095–1103
6. Vierhout M, Fütterer J (2012) Extreme cervical elongation after sacrohysteropexy. Int Urogynecol J Pelvic Floor Dysfunct. 24(9): 1579–1580
7. Ramanah R, Berger MB, Chen L, Riethmuller D, DeLancey JO (2012) See it in 3D! Researchers examined structural links between the cardinal and uterosacral ligaments. Am J Obstet Gynecol 207: 437.e1–7
8. Ibeanu OA, Chesson RR, Sandquist D, Perez J, Santiago K, Nolan TE (2010) Hypertrophic cervical elongation: clinical and histological correlations. Int Urogynecol J Pelvic Floor Dysfunct 21(8):995–1000