Treatment of apical vaginal prolapse with minimal mesh repair (Uphold): patient-reported long-term outcomes and mesh-related complications

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Abstract

Introduction: To evaluate patient-reported outcomes and clinical findings after surgery for apical prolapse with the transvaginal Uphold mesh technique. Moreover, to evaluate the rate of mesh-related complications.

Material and Methods: A historical cohort study of patients who underwent surgery from January 1, 2012 to April 30, 2019, at Aarhus University Hospital, Denmark. Pelvic examination and patient completion of questionnaires were performed in 2018–2019. Information on adverse events and reoperations was obtained from medical records.

Results: A total of 240 patients were operated on using the Uphold mesh, 89% due to recurrent prolapse. Follow-up was attended by 192 patients (80%). Median follow-up time was 30 months, interquartile range 19–52. During follow-up, 29 patients (15%) underwent reoperation due to prolapse and are considered failures. Among the remaining, patient satisfaction was high. Thus, average score for pelvic symptoms affecting daily life was 2, on a scale of 0–10, where 0 represents no symptoms. The Patient Global Impression of Improvement (PGI-I) had an average score of 6.4 (1: very much worse; 7 very much better). Preoperatively, 89.5% of the women had grade 2 or more apical prolapse, whereas at follow-up, this was only 6.1%. Perioperative heavy bleeding needing embolization was observed in one patient (0.5%). Two patients had serious constriction of the ureter and needed re-operation. Postoperative complications, primarily temporary voiding problems, were observed in 15 patients (8%). Complications during the follow-up period were registered in 23 patients (12%); eight of these were mesh erosions. Due to complications, 11 patients (6%) needed re-operation.

Conclusions: The study confirms that the Uphold procedure in a centralized set-up is a procedure with high patient-reported satisfaction even in a population characterized...
1 | INTRODUCTION

Pelvic organ prolapse (POP) is a common condition affecting up to 50% of parous women. The most important risk factors are vaginal delivery, obesity and increasing age. POP results in various bladder, bowel and sexual symptoms, which can have a great impact on quality of life. There is a large discrepancy between objective findings of POP and subjective symptoms, and only symptomatic prolapse should be treated. Therefore, patient-reported symptoms are paramount in the diagnostic process and evaluation of the treatment.

Women have a lifetime risk of undergoing surgical treatment for POP of up to 19%, and 10%-30% of these women require reoperation due to recurrence, with previous POP surgery being a risk factor of recurrence.

Several operative procedures involving insertion of synthetic mesh have been described. Randomized controlled trials have demonstrated that synthetic mesh decreases objective recurrent prolapse compared with native tissue repair, whereas no difference in quality of life has been demonstrated. Moreover, synthetic mesh implies the risk of complications such as pain and mesh erosion. Thus, the use of vaginal synthetic mesh has caused intense debate. In 2016, the U.S. Food and Drug Administration (FDA) re-classified the mesh from group II to group III, placing the product under the most stringent level of review; and in April 2019, the FDA ordered all manufacturers of synthetic mesh for transvaginal repair of anterior compartment prolapse to stop selling and distributing their products immediately. The FDA finds that these devices do not have adequate documentation of safety and effectiveness.

In Denmark, synthetic mesh has been predominantly used in the treatment of recurrent prolapse, and only in less than 2% of prolapse operations. Moreover, since 2012 the use of synthetic mesh has been considered a highly specialized function in Denmark and therefore performed at only two hospitals. In one of these, the Uphold procedure was the preferred mesh procedure because it is minimally invasive. The mesh is inserted transvaginally through a single anterior vaginal incision and driving the mesh arms through the sacrospinous ligaments. Previous studies show both positive and negative results regarding the Uphold procedure and long-term follow-up data are sparse. A Nordic study with 5-year follow-up showed that mesh erosion occurred in 1.4% of patients and pain was the main reason for doctor in only 2.6% of visits. Thus, we have considered the Uphold procedure a safe and appropriate treatment of recurrent prolapse.

by a high proportion of recurrent prolapse. Moreover, the procedure seems safe with acceptable complication rates.

KEYWORDS
apical compartment, complications, patient-reported outcomes, pelvic organ prolapse, recurrent prolapse, transvaginal mesh

Key message
Treatment of recurrent pelvic organ prolapse after previous native tissue repair is challenging. This study demonstrates low risk of complications with centralized use of a vaginal synthetic mesh (Uphold). Patient satisfaction was high and rate of recurrent apical prolapse low.

The aim of this prospective study was to evaluate objective and patient-reported outcomes of operation for predominantly recurrent apical prolapse. Moreover, we sought to evaluate the risk of mesh-related complications.

2 | MATERIAL AND METHODS

This study was a historical cohort study. From January 1, 2012, to April 30, 2019, 240 patients were operated on using the Uphold™ LITE Vaginal Support System (Boston Scientific) at the Department of Gynecology and Obstetrics, Aarhus University Hospital. All patients were invited by letter to a clinical follow-up visit in 2018–2019.

2.1 | Operation technique

All patients were operated using the Uphold procedure without any concomitant surgery. Most patients underwent surgery under local anesthesia with a bilateral pudendal nerve block, obtained using 7 mL bupivacaine hydrochloride 0.5% combined with infiltration anesthesia using 60 mL lidocaine 2.5 mg/mL with adrenaline 5 μg/mL injected into the vaginal mucosa and the paravaginal space. All patients also received intravenous medication with alfentanil, propofol or fentanyl for light sedation. Only a few patients underwent surgery under general anesthesia. All patients were given a single dose of metronidazole in combination with cefuroxime as antibiotic prophylaxis.

The vaginal mucosa and the pubocervical fascia were opened in the midline of the anterior vaginal wall from the vault/cervix to 2 cm from the external opening of the urethra. The sacrospinous ligaments were identified by blunt and sharp dissection of the paravaginal space, and the arms of the Uphold LITE Vaginal were placed in the ligaments with the Capio™ Suture Capturing Device (Boston Scientific). The upper, central part of the mesh was anchored with three polydioxanone 3–0...
sutures to the anterior surface of the cervix or the apical part of the pubocervical fascia in patients who had undergone previous hysterectomy. The distal part of the mesh was anchored to the pubocervical fascia with three polyglactin 3–0 sutures. The vaginal wall mucosa was closed with a running polyglactin 3–0 suture. To visualize free passage of urine through the ureters, a cystoscopy was performed at the end of the surgery. After the operation, the vagina was packed. During the operation, all patients had an indwelling bladder that was removed together with the vaginal packing after 3 h.

If the patient had an acceptable pain level and could empty her bladder, she was discharged on the day of the operation. If she had voiding problems only, she was admitted to the patient hotel, which is a unit where the patient needs to be self-reliant but where a nurse is present and can ensure sufficient bladder emptying. If the patient had additional problems such as pain, nausea or vomiting, she was admitted to the stationary ward until improvement of symptoms.

2.2 | Clinical follow-up visit

2.2.1 | Questionnaires

The Pelvic Floor Distress Inventory (PFDI-20) (Validated Danish version) and individual questions from the International Consultation on Incontinence Questionnaire-Vaginal Symptoms (ICIQ-VS) and Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire, IUGA-Revised (PISQ-IR) were answered at follow-up. Moreover, the Patient Global Impression of Improvement (PGI-I) symptom questionnaire was answered.

2.2.2 | Clinical examination

A gynecological examination was performed and grade of prolapse was staged using the Pelvic Organ Prolapse Quantification system. A separate chart focusing on objective mesh complications was filled out, and a vaginal ultrasound examination supplemented the gynecological examination. The doctors who examined the patients were the same team of gynecologists who performed the Uphold procedures. Optimal objective outcome was defined as prolapse of less than stage 2.

2.2.3 | Medical charts

Information on POP before the Uphold procedure and previous pelvic floor surgery was retrieved from the medical records. All medical records were thoroughly reviewed to evaluate the rate of complications perioperatively, postoperatively and during follow-up. All patients were seen for clinical examination 6 months after the operation and complications were registered in the medical record. Since the department at Aarhus University Hospital was one of two departments in Denmark to perform operations with insertion of mesh, the women were unlikely to be referred elsewhere when presenting with complications or recurrence. Patients who had undergone a new prolapse operation during the follow-up period were classified as failures.

2.3 | Statistical analyses

Descriptive data were presented as median and interquartile range or count and percentages (%). Complication rates were calculated as proportions with corresponding 95% confidence intervals. EXCEL version 16.32 (Microsoft Corp) was used in all analyses.

2.4 | Ethical approval

Since the study is considered a "control of quality" further approval by the national ethical committee is not needed in accordance with the Danish law on medical research. The study was approved by The Danish Data Protection Agency (1-16-02-72-18).

3 | RESULTS

Among the 240 women who underwent the Uphold mesh procedure during the study period, 192 were available for follow-up (Figure 1). Table 1 provides information on cohort characteristics at follow-up. Median follow-up time was 30 months, interquartile range 19–52.

During follow-up, 32 women (17%) experienced recurrent POP. Of these, 29 underwent reoperation and are classified as failures (Figure 1). To avoid underestimation of the frequency of recurrent prolapse, we included prolapse in all three compartments, although the Uphold mesh procedure is primarily a treatment of prolapse in the apical compartment. Some patients had prolapse in more than one compartment.

The questionnaire was completed by 162 women at follow-up (Figure 1). Of these, 150 women responded that their current condition regarding prolapse symptoms had improved compared with their preoperative condition (a little:10, a lot:49, very much:91). Three patients replied that their current condition was unchanged, and two patients had a worsened condition. Seven patients did not answer that specific question.

Patient-reported prolapse, voiding and bowel symptoms at follow-up are given in Table 2.

The patients were asked to grade the degree to which prolapse symptoms currently affected their daily life on a visual analog scale (VAS) ranging from 0 to 10, “zero” being no impact on daily life. No or little impact on daily life (VAS 0–2) was reported by 111 patients (69%). Some impact (VAS 3–7) was reported by 26 patients (16%), whereas 13 (8%) were affected a lot (VAS 8–10). Twelve patients did not answer that question.

Ten women (6%) reported a feeling of bulge protruding outside the vagina either often or constantly. The average VAS score for these 10 women was 8.5, showing they were severely bothered.
Questions regarding sexual activity demonstrated that 66 women (41%) were currently sexually active, 23 women (14%) were sexually inactive due to their vaginal symptoms, and 64 women (40%) were not sexually active due to other reasons. Nine women did not answer the question.

We defined the optimal anatomic outcome as prolapse of less than stage 2. Preoperatively, 178 women (93%) had a stage 2 prolapse or more in the anterior compartment, 172 (90%) in the apical compartment, and 73 (38%) in the posterior compartment. After the Uphold procedure, this was reduced to 54 women (37%) with a prolapse in the anterior compartment, 9 women (6%) with one in the apical compartment, and 22 women (15%) with one in the posterior compartment. No women had a stage 4 prolapse in any of the compartments, and stage 3 prolapse was only seen in the anterior compartment and in only two patients (Table 3).

Complication rates in the total study population \(n = 192\) are presented in Table 4. Three intraoperative complications were observed (1.6%). One was a case of extensive bleeding (2500 mL), where arterial embolization was needed to obtain hemostasis. In two patients (1%), the insertion of the mesh led to ureter obstruction, which was detected at the cystoscopy at the end of the Uphold procedure. Both patients were treated with a JJ catheter, and the obstructing band of the mesh was removed. Thus, intraoperative complications were severe in all three women and led to re-operation.

The postoperative period was defined as 1–30 days after the operation. During this time span, 15 patients (8%) experienced complications due to the Uphold procedure. Most of the postoperative complications were temporary voiding difficulties beyond the day after surgery, which was seen in 10 patients (5%). The remaining complications in the postoperative period were minor complications (Table 4).

During follow-up, 23 patients (12%) experienced problems related to the Uphold procedure. Some patients had more than one type of complication, and thus the total number of complications was 31. Pain in the pelvic area was seen in nine patients (5%). Spontaneous resolution occurred in two cases; seven patients were treated with either physiotherapy and/or a block with mepivacaine in combination with corticosteroid.

Erosion of the mesh through the vaginal mucosa occurred in eight patients (4%). In three cases the mesh erosion was symptomatic and in the remaining five cases the erosion was detected at clinical examination. All patients were offered reoperation with partial removal of the mesh, which seven patients accepted. Six patients (3%) experienced loosening of the mesh due to detachment of the mesh from the sacrospinous ligament. Five of these patients underwent reoperation with either re-fixation or removal of some or the whole mesh; one patient felt no need for treatment. The total number of patients undergoing reoperation during follow-up was 11 (6%).

Urinary incontinence of some degree was reported by 99 women (61%) in the questionnaire, but only 13 women (8%) requested...
TABLE 1 Characteristics at follow-up of women operated on using Uphold mesh in 2012–2019 at the Department of Gynecology, Aarhus University Hospital, Denmark. Median follow-up time was 30 months (interquartile range 19–52). n = 192

| Characteristic                                    | n (%)          |
|--------------------------------------------------|----------------|
| Age, median (IQR)                                | 68 (58–71)     |
| Body mass index, median (IQR)                    | 26 (23–29)     |
| Menopausala                                      | 165 (85.9)     |
| Smoking                                          | 17 (8.6)       |
| Hormone replacement therapyb                     |                |
| Vaginal                                          | 74 (38.3)      |
| Other                                            | 13 (6.8)       |
| Somatic diseases                                  |                |
| Asthma                                           | 14 (7.3)       |
| Arthritis                                        | 18 (9.4)       |
| Diabetes treated with insulin                     | 7 (3.6)        |
| Diabetes treated with tablets                     | 21 (10.9)      |
| Cardiovascular                                   | 16 (8.3)       |
| Hypertension                                     | 75 (39.1)      |
| Other                                            | 21 (10.9)      |
| Previous prolapse surgery                         |                |
| Hysterectomy                                     | 96 (50.0)      |
| Vaginal                                          | 45 (23.4)      |
| Laparoscopic/abdominal                           | 51 (26.6)      |
| Anterior colporrhaphy                            | 121 (63.0)     |
| Lateral colpopexy                                | 24 (12.5)      |
| Posterior colporrhaphy                           | 49 (25.5)      |
| Amputation of cervix                             | 19 (9.9)       |
| Vaginal correction for enterocele                | 21 (10.9)      |
| Ipsilateral uterosacral ligament suspension      | 8 (4.2)        |
| Sacrospinous fixation                            | 110 (57.3)     |
| Sacrocolpopexy                                   | 3 (1.6)        |
| TVT/TVT-O                                        | 8 (4.2)        |
| Burch operation                                  | 2 (1.0)        |
| Perineoplasty                                    | 12 (6.3)       |
| Other type of prolapse operation                 | 5 (2.6)        |
| Total number of patients with previous surgery   | 171 (89.1)     |

Abbreviations: IQR, interquartile range; TVT, tension-free vaginal tape; TVT-O, tension-free vaginal tape--oburator.
a Menopausal status unknown in four patients.
b Data missing in one patient.

Further diagnostic investigations. Nine patients received surgical treatment and four patients received medical treatment.

4 | DISCUSSION

This prospective cohort study demonstrates high patient satisfaction 30 months (interquartile range 19–52) after the Uphold procedure. However, 29 patients (12%) underwent reoperation due to prolapse and are considered failures. Among the rest, subjective prolapse symptoms were sparse, and anatomical success in the medial compartment was found in 94%, whereas 63% met this criterion in the anterior compartment. The Uphold procedure had few perioperative complications but 12% experienced mesh-related complications during the follow-up period and 6% needed re-operation.

For the patient, the main goal is alleviation of prolapse symptoms. In the present study, only a few patients had prolapse symptoms at follow-up, and the level of patient satisfaction was very high. Other studies have demonstrated similar results.6,7,10 A retrospective study comparing the results after the Uphold procedure with the results after anterior colporrhaphy in two different cohorts including a total of 165 patients demonstrated significantly higher levels of patient satisfaction after Uphold.11 Moreover, the level of patient satisfaction seems to be persistent because no deterioration of outcomes from 1 to 5 years after the Uphold procedure was demonstrated in the Nordic multicenter study.8

The present study population is characterized by the high rate of women with recurrent prolapse. Thus, nearly 90% of patients had previously undergone surgery for prolapse and/or incontinence, and many of the patients had several operations before the Uphold procedure.

Olsen et al.12 demonstrated that women undergoing surgery for prolapse have a 29.2% lifetime risk of reoperation due to prolapse and incontinence.12 Moreover, it has been demonstrated that patients operated on for recurrent prolapse have a higher risk of operative failure than primarily operated patients.13 Thus, in a patient population like the present with predominately recurrent prolapse, it is less attractive to try yet another native tissue operation to relieve the prolapse symptoms.

In 2012, treatment with mesh in Denmark was defined as a specialized treatment that could only be performed in two departments. This approach has ensured that experience with the treatment, the specific operations and the treatment of possible complications are restricted. This restrictive setup is in accordance with recommendations from the European Urology Association (EAU) and the European Urogynecology Association (EUGA).14

Mesh-related complications can be due to the mesh material, the size of the mesh and the operative procedure for insertion of the mesh. The mesh material in the Uphold system is type I polypropylene, which is the mesh type most optimal for vaginal insertion.15 The area of the mesh is significantly reduced compared with the formerly used Prolift® mesh7 and insertion of the mesh is considered a minimally invasive procedure, which can be undertaken as a day surgery procedure in local anesthesia supplemented with sedation.

There are no randomized controlled trials comparing the Uphold procedure with other mesh-related procedures. The Nordic multicenter study demonstrates a non-statistically significant lower rate of serious complications compared with a previous multicenter study of Prolift®.7 In that study, serious complications including bladder perforations, heavy bleeding, removal of mesh due to pain and mesh-exposure were found in 4.3%.7 In our study, 1.6% had serious complications, with heavy bleeding or ureter obstruction. Moreover,
6% underwent reoperation due to mesh-related problems during follow-up. The erosion rate is comparable to other prospective studies on Uphold, where the erosion rates vary from 1.4% to 8%\(^8,10,16\) and various types of synthetic meshes.\(^17\) Pain was a clinical problem in 4.7% and could be treated conservatively without operation.

In the present study, a large number of patients underwent reoperation due to prolapse during follow-up and are considered as failures. However, only 9% had failure of the repair in the apical compartment. The failure rate is slightly better than in the Nordic study with a 5-year follow-up,\(^8\) where optimal anatomical outcome in the apical compartment was found in 83% of the women and quality of life was improved in 79% of the women after the operation.\(^8\) Moreover, cystocele of less than grade 2 was found in 70%, which is comparable to our findings of 63%.

| TABLE 2 | Objective findings of prolapse before the performance of the Uphold procedure in 2012–2019 at the Department of Gynecology, Aarhus University Hospital and at follow-up (median 30 months [interquartile range 19–52]). Data are presented as clinical stages according to recommendations from the International Continence Society quantification system |
|---|---|---|---|
| Preoperatively (n = 192) | | | |
| | Anterior | Apical | Posterior |
| Stage 0 | 1 (0.5) | 1 (0.5) | 44 (22.9) |
| Stage 1 | 12 (6.3) | 19 (9.9) | 75 (39.1) |
| Stage 2 | 125 (65.1) | 122 (63.5) | 48 (25.0) |
| Stage 3 | 40 (20.8) | 35 (18.2) | 14 (7.3) |
| Stage 4 | 13 (6.8) | 15 (7.8) | 11 (5.7) |
| At follow-up (n = 147)\(^a\) | | | |
| | Anterior | Apical | Posterior\(^b\) |
| Stage 0 | 46 (31.3) | 88 (59.9) | 80 (54.4) |
| Stage 1 | 47 (32.0) | 50 (34.2) | 44 (29.9) |
| Stage 2 | 52 (35.4) | 9 (6.1) | 22 (15.0) |
| Stage 3 | 2 (1.4) | 0 | 0 |
| Stage 4 | 0 | 0 | 0 |

Note. Data shown as n (%). Abbreviation: n, number.\(^a\) Failures not included.\(^b\) Missing data in one patient.

| TABLE 3 | Complications in a cohort of women operated on with use Uphold mesh in 2012–2019 at the Department of Gynecology, Aarhus University Hospital, Denmark. n = 192 |
|---|---|---|---|
| | nN | % (95% CI) |
| Intraoperative complications | | | |
| Bleeding >200 mL | 1 | 0.5 (0.01–2.9) |
| Ureter obstruction | 2 | 1.0 (0.3–3.7) |
| Total | 3 | 1.6 (0.5–4.5) |
| Postoperative complications, 1–30 days | | | |
| Voiding difficulties | 10 | 5.2 (2.8–9.3) |
| Bleeding | 3 | 1.6 (0.5–4.5) |
| Pain | 1 | 0.5 (0.1–2.9) |
| Wound infection | 1 | 0.5 (0.1–2.9) |
| Total | 15 | 7.8 (4.8–12.5) |
| Complications during follow-Up\(^a\) | | | |
| Pain | 9 | 4.7 (2.5–8.7) |
| Mesh erosion, reoperation | 7 | 3.6 (1.8–7.3) |
| Mesh erosion, not reoperated | 1 | 0.5 (0.1–2.9) |
| Loosening of mesh, reoperation | 5 | 2.6 (1.1–6.0) |
| Loosening of mesh, not reoperated | 1 | 0.5 (0.1–2.9) |
| Voiding difficulties | 1 | 0.5 (0.1–2.9) |
| Defecation problems | 1 | 0.5 (0.1–2.9) |
| Recurrent urinary infections | 6 | 3.1 (1.4–6.6) |
| Total | 31 | 16.1 (11.6–22.0) |

Note. Data shown as n (%). Abbreviations: CI, confidence interval; n, number.\(^a\) Median follow-up time was 30 months (interquartile range 19–52).

| TABLE 4 | Patient-reported symptoms in 162 women at follow-up. Patients undergoing reoperation for prolapse during follow-up are considered failures and are not included |
|---|---|---|---|
| | Yes | No | Missing | Mean symptom score\(^a\) (1–4) |
| Prolapse symptoms | | | | |
| Vaginal bulge | 34 (21.0) | 124 (76.5) | 4 (2.5) | 1.9 |
| Vaginal soreness | 70 (43.2) | 90 (55.6) | 2 (1.2) | 1.6 |
| Voiding symptoms | Yes | No | Missing | Mean symptom score\(^a\) (1–3) |
| Urine incontinence | 99 (61.1) | 58 (35.8) | 5 (3.1) | 1.3 |
| Difficult voiding function | 17 (10.5) | 138 (85.2) | 7 (4.3) | 1.7 |
| Bowel symptoms | Yes | No | Missing | Mean symptom score\(^a\) (1–3) |
| Difficult defecation function | 50 (30.9) | 108 (66.7) | 4 (2.5) | 1.6 |
| Fecal incontinence | 31 (19.1) | 128 (79.0) | 3 (1.9) | 1.6 |
| Painful defecation | 12 (7.4) | 147 (90.7) | 3 (1.9) | 1.3 |

Note. Data shown as n (%). Abbreviations: n, number; VAS, visual analog scale.\(^a\) The mean VAS symptom score among women having symptoms. Thus, women answering "no" to symptoms are not included.
In the Nordic study, previous anterior colporrhaphy and an isolated Uphold procedure were found to be risk factors for reoperation. In the present study, 63% of the women had previously undergone surgery in the anterior compartment, and most patients had undergone an isolated Uphold procedure. Other studies have demonstrated low re-operation rates of 0%–3% about 2 years after Uphold procedure.\textsuperscript{18–20} This might reflect the shorter follow-up period or a different access to reoperation.

The Uphold mesh was withdrawn from the market in April 2019 at the request of the FDA.\textsuperscript{5} Of course, implants need to fulfill all legal requirements. However, the withdrawal of all types of synthetic vaginal meshes implies a risk that an individual evaluation will not be available of the type of material and operative setup related to each type of mesh. Given the high recurrence rate after native tissue repair, it may not be possible to offer the patient a more sustainable treatment for multiple recurrent prolapse. The results presented in this paper and in previous studies suggests that the use of the Uphold mesh might be reconsidered for treatment of recurrent prolapse in specialized centers.

The main strength of this study is that it was a systematic, prospective study of a high-volume cohort from a single center. All adverse events needing operative treatment were registered. Moreover, women were examined for objective prolapse and were systematically interviewed for subjective symptoms and quality of life with symptom-specific questionnaires after surgery. Our study included a high-risk population because of previous prolapse surgery, whereas many other studies on new procedures only included patients for primary surgery. A long follow-up period ensured examination of the durability of the procedure. Moreover, since our department is the only department in the Central Region of Denmark to perform operations for vaginal vault prolapse, women with recurrence were unlikely to be referred elsewhere for treatment of renewed prolapse or complications after the Uphold procedure.

However, the study has several limitations. The Uphold mesh has been withdrawn from the market, leaving the results with limited interest for the future. However, especially in this situation, it seems appropriate to assess treatment results because of their relevance regarding women treated with an implant. The study population includes a few women with primary prolapse, but most women had a history of several previous prolapse operations. Moreover, both women with and without previous hysterectomy were included. However, this cohort reflects only patients treated at our hospital. At the follow-up, the investigators were unaware of the subjective symptoms reported by the women in the questionnaires. However, it was known that an Uphold procedure had been performed, and this unblinding increases the risk of underestimating the recurrence rate.\textsuperscript{21}

5 | CONCLUSION

This prospective study confirms that the Uphold procedure in a centralized setup is a procedure with a high level of patient-reported satisfaction in a population characterized by a high proportion of recurrent prolapse. Moreover, the procedure seems safe with acceptable complication rates.

CONFLICT OF INTEREST

SG, SMA and MG-K have received travel grants from Astellas. KMB has received speaker honorarium from BK Ultrasound. AM declares no conflicts.

AUTHOR CONTRIBUTIONS

AM, MG-K: project development, data analysis. SG: project development. All authors: data collection, manuscript editing.

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