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# Evaluation of the Impact of Laparoscopic Supracervical Hysterectomy for the Treatment of Adenomyosis on Pain Intensity and Patient Satisfaction

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## Abstract

*Objectives.* Common symptoms of adenomyosis include pain and bleeding disorders and can severely impact a patient's quality of life. Few studies report on the impact of hysteroscopy procedures on improving these symptoms. This study evaluates the effect of laparoscopic supracervical hysterectomy (LASH) in adenomyosis patients on pain in general, pain during intercourse, bleeding disorders and general satisfactoriness of the procedure. *Methods.* This prospective observational single-arm, single-center study included 256 patients treated with LASH and whose histological analysis revealed adenomyosis. Other inclusion criteria were completed family planning and no more symptom relief with conservative therapy. They completed questionnaires before and after the procedure which evaluated pain in general, pain during intercourse, bleeding disorders and general satisfactoriness of the procedure. *Results.* Our results showed a significant ($p < 0.0001$) reduction of pain (from 1261 to 428 pain points), dyspareunia (from 763 to 224 pain points) and bleeding disorders when compared before and after LASH treatment. Furthermore, we found a high satisfaction rate of 98.4%. *Conclusion.* As a minimal invasive procedure associated with low major complication rates, LASH is a qualified therapeutic choice to treat pain and bleeding disorders in adenomyosis patients with completed family planning and in where conservative therapy failed.

## Keywords

Hysterectomy, Laparoscopy, Endometriosis, Adenomyosis, LASH, Pain

Management

## 1. Introduction

Endometriosis is defined as the benign, ectopic growth of endometrial tissue, predominantly within the peritoneal cavity [1]. It mainly affects women of reproductive age, has a high recurrence rate and its pathogenesis is unclear [2]. Adenomyosis (previously called endometriosis interna) is a specific type of endometriosis where the ectopic endometrial growth occurs in the myometrium. Adenomyosis predominantly affects peri-menopausal and multiparous women [3]. Common, often debilitating, symptoms include abnormal bleeding (metrorrhagia), extreme and/or chronic pelvic pain, painful periods (dysmenorrhea), pain during intercourse (dyspareunia), as well as infertility. Approximately 20% - 25% of patients experience no symptoms [4]. No specific biomarkers have been found so far, so current diagnosis is only possible via hysteroscopic or laparoscopic biopsy; non-invasive imaging can contribute to differential diagnosis [5]. Reports on the prevalence of adenomyosis vary widely from 1% - 70%, depending on the study population and the diagnostic criteria used. These major differences can be explained by the fact that signs and symptoms are unspecific and that diagnosis after hysterectomy is less convenient since the implementation of minimally invasive techniques often makes use of a morcellator, which complicates the determination of cell origin. Two different systematic reviews however, estimate the prevalence between 20% and 30% in the general female population while the prevalence in women with bleeding disorders is calculated as high as 50% [6] [7].

The impact on the quality of life of common adenomyosis symptoms, such as pain and bleeding disorders, is often quite severe. Current therapeutic strategies focus on relieving clinical symptoms and range from conservative medicinal approaches to definite complete hysterectomies [8]. The present study evaluates the effect of laparoscopic supracervical hysterectomy in adenomyosis patients on pain in general, pain during intercourse, bleeding disorders and general satisfactoriness of the procedure.

## 2. Materials and Methods

### 2.1. Study Design

This study is a prospective observational, single-arm, single-center study designed to assess the effect of laparoscopic assisted hysterectomy (LASH) on the severity of pain in general, pain during intercourse, and bleeding disorders as compared before and after surgery in patients with adenomyosis.

### 2.2. Ethical Approval

For the present study, no ethical approval is required in Germany. All patients

were adequately informed about the details of the study and provided written informed consent before the procedure.

### 2.3. Patients and Methods

From January to December 2014, women who received LASH (performed as described in [9]) and whose histological analysis revealed adenomyosis, were included in this study. Other inclusion criteria were completed family planning and women who no longer experienced symptom relief with conservative therapy. As such, we obtained completed questionnaires from before and after the procedure of 256 women. The average demographics of study participants are shown in Table 1. The following parameters were compared before and after surgery: pain in general, pain during intercourse, and, bleeding disorders. We used the visual analog scale (VAS) to measure pain severity (Figure 1). When inquired whether they experienced bleeding, patients could choose between the following answers: "never", "once", "irregular" or "monthly". Patients were given the questionnaires right before surgery and again about a year after surgery to allow for enough time for follow-up and proper assessment of the questions asked. Furthermore, postoperative satisfactoriness of patients was evaluated as well. Patients could answer the question "How satisfied are you with your surgery?" with "Very satisfied", "Satisfied", "Partially Satisfied", and, "Not Satisfied".

### 2.4. Statistical Analysis

The results from the VAS were converted into numbers ranging between 0 and 10 where 0 indicates the absence of pain and 10 corresponds to unbearable pain. Values between 0 and 3, 4 and 6, 7 and 10 are classified as no to low pain, moderate pain and severe pain respectively. Data were analyzed using Windows-Excel (Microsoft 2010). Statistical analyses were performed using SPSS for Windows (SPSS 16.0, SPSS, Inc., Chicago, IL).

## 3. Results

Table 2 gives an overview of the results of the questionnaires completed by our study collective before and after LASH treatment.

### 3.1. Pain in General

255 subjects of our study group of 256 women (99.6%) completed the questionnaire regarding pre- and postoperative pain experience. Before the LASH procedure, 89 adenomyosis women (34.8%) indicated they experienced no to low pain while 64 (25.0%) and 102 (39.8%) women reported moderate and severe

**Table 1.** Demographic characteristics.

| Age (years) | Weight (kg) | BMI |
|---|---|---|
| 50.6 | 70.9 | 25.5 |

Average demographics of the 256 patients from our study group.

**Table 2.** Questionnaire outcome.

| | Before LASH | | After LASH | |
|---|---|---|---|---|
| | **N** | **%** | **N** | **%** |
| **Pain in general (sum of pain points)** | 1261 | | 428 | |
| No to low pain | 89 | 34.8 | 211 | 82.0 |
| Moderate pain | 64 | 25.0 | 32 | 12.5 |
| Severe pain | 102 | 38.9 | 12 | 4.7 |
| **Pain during intercourse (sum of pain points)** | 763 | | 224 | |
| No to low pain | 142 | 55.5 | 231 | 90.2 |
| Moderate pain | 57 | 22.3 | 11 | 4.3 |
| Severe pain | 46 | 18.0 | 6 | 2.3 |
| **Bleeding disorders** | | | | |
| Bleeding, impairing QOL | 177 | 69.1 | 92 | 35.9 |
| No experience of bleeding | 77 | 30.0 | 160 | 62.5 |
| **Patient satisfaction with LASH procedure** | | | | |
| Very satisfied | | | 196 | 76.6 |
| Satisfied | | | 43 | 16.8 |
| Partially satisfied | | | 13 | 5.1 |
| Not satisfied | | | 4 | 1.6 |

(LASH = Laparoscopic Supracervical Hysterectomy; QOL = Quality of Life).

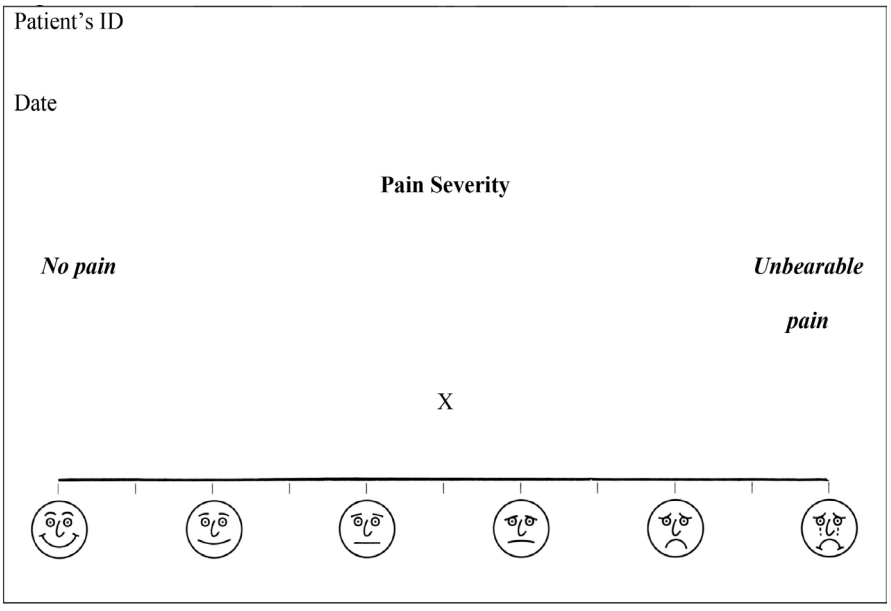


**Figure 1.** The Visual Analog Scale to evaluate pain severity. In our study, the Visual Analog Scale (VAS) was used as a tool for patients to subjectively answer the following three questions asked in our study (all three were asked both before and after surgery): "how intense and how frequent do you experience pain in general, pain during intercourse, and, bleeding disorders?"

pain respectively. The sum of numeric values of the VAS regarding preoperative pain in our study group was 1261.

After surgery, 211 women (82.0%) reported no to low pain, while only 32 (12.5%) indicated experiencing moderate pain and merely 12 (4.7%) reported severe pain. The sum of pain points in our patient collective dropped from 1261 before surgery to 428 after surgery ($p < 0.0001$).

### 3.2. Pain during Intercourse

Patients were asked to complete a VAS to evaluate pain experience during intercourse before and after LASH treatment. 248 of 256 women (96.9%) completed those questionnaires. Before the operation, 142 women (55.5%) reported no to low dyspareunia whereas 57 (22.3%) indicated experiencing moderate pain. 46 (18.0%) of all women expressed to experience severe pain during sexual relations. After surgery, the number experiencing no to low pain during intercourse increased to 231 (90.2%). Only 17 patients still reported dyspareunia after the LASH procedure of whom 11 (4.3%) expressed moderate pain and six (2.3%) severe pain. The sum of numeric values of the VAS evaluating dyspareunia dropped from 763 before LASH to 224 after LASH ($p < 0.0001$).

### 3.3. Bleeding Disorders

Before LASH surgery, 177 patients (69.1%) reported bleeding disorders which impaired their quality of life. 77 patients (30.0%) did not experience bleeding whereas two patients were non-responders (99.2% response rate).

After surgery, the number of patients without bleeding increased to 160 (62.5%). 92 patients still reported bleeding disorders. Of those, 41 subjects (16%) noticed only a single postoperative bleeding, 27 patients (10.5%) reported irregular spotting, and, 24 subjects (9.4%) still reported regular bleeding. Four patients did not answer the questions regarding postoperative bleeding (98.4% response rate).

### 3.4. Patient Satisfactoriness

After LASH treatment, 196 patients (76.6%) ticked the box "very satisfied", 43 (16.8%) marked "satisfied", and 13 (5.1%) "partially satisfied". Taken together, this indicates that 98.4% of our patients collective were satisfied with LASH surgery. Four patients (1.6%) reported to be "unsatisfied" with their treatment.

## 4. Discussion

Adenomyosis is affecting a considerable percentage of the female population and the often severe symptoms have a profound impact on women's quality of life. The optimal therapeutic choice should be defined individually, taking into account the intensity of symptoms, a possible future wish for pregnancy, the age and subsequent impact of preliminary menopausal state on a woman's life.

The first step in the non-surgical approach is the administration of painkillers

(mainly NSAIDs). The most established medical therapy consists of gonadotropin-releasing hormone agonists (GnRHa). Studies show that GnRHa reduce pain, decrease uterus size and can even induce amenorrhea. They can only be taken during a period of up to six months because of their hypo-estrogenic side effects [10] [11] and when treatment is disrupted, women experience reappearance of the disease and its symptoms ([10] p. 12). Because adenomyosis and endometriosis are considered estrogen-dependent, aromatase inhibitors which inhibit the conversion of androgens into estrogens, are conservative options as well [11]. Both are also used after conservative surgery in order to reduce recurrence rates [12]. The continuous intake of oral contraceptives, both the progestin-only as the combined, has shown to relieve symptoms of adenomyosis and endometriosis in some women as well, since they induce amenorrhea. Some studies even suggest that their effect is similar to that of GnRHa with the advantage that they are less expensive, induce fewer side effects and can be administered for a longer period of time [13].

Uterine artery embolization (UAE) is an option for women who do not wish or are not suitable for surgical intervention [14]. The efficacy and the prevalence of serious side effects are similar as with hysterectomy procedures yet shorter convalescence is an obvious advantage. Nevertheless, even though the possibility of future pregnancies is not ruled out, tentative evidence suggests that UAE impairs fertility due to a higher risk of abnormal placentation. Moreover, more repeat surgeries are required as compared to traditional surgery [15]. MRI-assisted high intensity focused ultrasound ablation has been shown to be safe and effective for the treatment of uterine fibroids with the advantage of being less invasive than other procedures hence recovery periods are shorter. This treatment is time-consuming, the efficiency is significantly higher for women with distinctly localized adenomyosis foci and about 16% - 20% of patients require additional treatment afterwards [16] [17].

The most definite approach is complete hysterectomy, yet, there is a tendency towards uterine-sparing interventions, in particular when there is a future wish for pregnancy. The latter methods focus on symptom relief, removal of endometriotic foci, and, prevention of the formation of new extra-uterine endometrial tissue. Those surgical options include endometrial ablation and excision of endometriotic foci in the myometrium. Because of unknown depth of adenomyotic penetration and difficult exposure of the foci in the myometrium, the recurrence rate with both procedures is high (reported up to 50%). Furthermore, endometrial ablation induces a high risk of bleeding while foci excision leaves scars in the uterus, which could affect fertility [14] [18].

In the last decades, a gradual shift from abdominal hysterectomy procedures towards minimal invasive techniques occurred because of demonstrated advantages of the latter, such as minor trauma, improved aesthetic outcome, and, lower costs [9] [19] [20] [21]. Yet, as shown by many research groups, total laparoscopic hysterectomy is associated with a relatively high rate of major complications (between 4.5% and 5.8%), in particular injuries to the urinary tract [22]

[23]. In contrast, the incidence of major complications occurring with LASH is reported to be between 0.23% and 0.5% [23] [24] [25] [26].

All therapies have demonstrated positive effects in terms of symptom relief, but it is difficult to interpret results since most studies are retrospective and apply different methods to identify and quantify pain. Furthermore, chronic pelvic pain is often associated with issues in other organ systems besides the reproductive tract [27]. Both for symptom improvement and preventing disease recurrence, complete eradication of adenomyotic lesions is superior to medical treatment and sclerotherapy [28]. Approximately 12% of women with endometriosis will eventually require a hysterectomy to be relieved of symptoms [29]. According to clinical experience, definitive hysterectomy surgery accomplishes satisfactory alleviation of adenomyosis-associated pain. However, a recent study reports a 15% probability of persistent pain after standard hysterectomy with a 3% - 5% risk of worsening pain or new symptom development [30].

We performed LASH on adenomyosis patients with no future wish for pregnancy and who no longer achieved symptom relief with conservative therapy. In our patient group of 256 patients, only 46 (17.9%) reported an increase in pain in general, 22 (8.6%) indicated increased pain during intercourse and 59 (23%) reported increased bleeding disorders. Pain in general decreased significantly ($p < 0.001$) from 1261 to 428 pain points as compared before and after LASH. These results are similar as those of Berner *et al.* (2014) who investigated the impact of LASH on cyclic pelvic pain in 113 patients [31]. They found that only 32.4% of women in their study group still experienced this pain 12 months after surgery. Additionally, our evaluation also showed that pain during intercourse dropped significantly ($p < 0.001$) from 763 to 224 pain points. Moreover, the number of patients who no longer experienced dyspareunia after surgery increased from 142 to 241. As a result of LASH treatment, the number of patients suffering from bleeding disorders decreased from 69.1% to 35.9%. Our study population showed a very high satisfaction rate of 98.4%. 76.6% of our patients indicated to be very satisfied with the LASH procedure, 16.8% of patients reported to be satisfied and 5.1% were partially satisfied.

Our results suggest that LASH is promising in being a method of choice for respective patients but more prospective randomized studies are needed to confirm this hypothesis as well as to compare with other hysterectomy procedures.

## Ethical Approval

For this type of study formal consent is not required.

## Conflicts of Interest

The authors declare that they have no conflict of interest.

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