Introduction

In Europe the number of laparoscopic supracervical hysterectomy (LASH) operations increased during the last two decades. LASH is considered as an alternative to total hysterectomy, although detailed data are still lacking. No data concerning the distribution of open or laparoscopic access techniques are available yet [1].

In northern parts of Europe up to 41.5% of abdominal hysterectomies are performed as supracervical hysterectomies [2]. The laparoscopic approach is thought to reduce complications, morbidity and scars. There is still no evidence of benefits regarding prolapse prophylaxis [3,4]. Supracervical hysterectomies are reported to elevate the risk of postoperative stump infection, carcinoma of the remaining cervical stump and continuous monthly spotting [5–9]. Infection of the cervical stump is found up to 14 days after operation and occurs in 6–10% of cases. In general, conservative therapy including antibiotics is sufficient. Carcinoma of the cervical stump has been reported in 0.1–0.2% of cases. This incidence is comparable to the incidence of carcinoma of the vaginal stump after total hysterectomy (0.17%) [8–10].

Independent of any additional coagulation of the cervical channel, spotting rates of up to 25% have been reported after supracervical hysterectomy. Here we report our stump infection and spotting rates after common laparoscopic supracervical hysterectomy (LASH) and LASH with additional laparoscopic excision of the cervical channel (eLASH).

Material and Methods: 260 premenopausal patients underwent LASH at our institution between January 2006 and June 2009. Until July 2007, we detached the cervix straight and coagulated the remaining cervical channel (LASH). Since July 2007, we have excised the cervical channel laparoscopically and coagulated the remaining cervical channel (eLASH). All patients were asked to fill in a self-administered questionnaire concerning their spotting rate, postoperative infections and smoking attitudes.

Results: We had a response rate of 70% (n = 183). 88 patients from the LASH group and 85 patients from the eLASH group completed the questionnaire. The questionnaire was incompletely filled in by nine patients. 21.6% (19/88) of the LASH group and 5.9% (5/85) of the eLASH group reported spotting continuing after the operation (p = 0.004). We had a postoperative stump infection rate of 6.8% (6/88) in the LASH group and 5.9% (5/85) in the eLASH group (p = 0.999). Only in smokers was there a tendency for elevated infection rates (9.4% [5/53] vs. 5.0% [6/120], p = 0.315).

Conclusion: The laparoscopic excision of the cervical channel reduces the spotting rate. The stump infection rate is moderate and comparable to LASH.

Key words

○ supracervical hysterectomy
○ laparoscopy
○ spotting
○ stump infection
○ nicotine

Abstract

Purpose: Spotting rates of up to 25% have been reported after supracervical hysterectomy. Here we report our stump infection and spotting rates after common laparoscopic supracervical hysterectomy (LASH) and LASH with additional laparoscopic excision of the cervical channel (eLASH).

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Conclusion: The laparoscopic excision of the cervical channel reduces the spotting rate. The stump infection rate is moderate and comparable to LASH.
In 1991, Semm described the excision of the cervical channel as a way of preventing cervical stump carcinoma [13]. He developed a specific instrument for the transvaginal excision procedure called CURT (Calibrated Uterine Resection Tool). [13]. This method was revived in 2010 by a Canadian group and additionally used for transvaginal access for morcellement [14].

There are no data available concerning spotting rates after the CURT procedure. In addition, the effects of the excision of the cervical channel on the number of postoperative infections have not yet been reported. Meanwhile, most surgeons prefer straight resection of the cervix followed by thermo-coagulation of the remaining cervical channel. Endo-loops ease this procedure [11].

Spotting may be reduced by the conical excision of the cervical channel (Fig. 2). Due to the reduced distance between the vagina and intraperitoneal space, this procedure might elevate the number of stump infections in the early postoperative period. The aim of this study was to compare the postoperative spotting rate after LASH in patients with a straight resection and in patients with a conical excision of the cervical stump. Additionally, the infection rate and the influence of nicotinic abuse on stump infection was analysed in both groups.

Material and Methods

260 premenopausal patients underwent LASH at our institution between January 2006 and June 2009. All operations were indicated by the head of the department (G.N.). All patients were operated on either by C.B. or G.N. and received perioperative single-shot antibiotics (intravenous cefuroxime and metronidazole). Postoperatively, all patients received Fluomycin® supp (transvaginal). Until July 2007, we detached the cervix straight and coagulated the remaining cervical channel (LASH, n = 130). Since July 2007, we have cut out the cervical channel laparoscopically and coagulated the remaining cervical channel (eLASH, n = 130). In both groups the remaining cervical stump was sutured with Vicryl® 0. All patients were asked to fill in a self-administered questionnaire at least six months after the operation concerning spotting rates, postoperative infections and smoking attitudes. Subjective disorders (pain, fever and other symptoms) combined with elevated infection parameters (leucocytosis and/or elevated C-reactive protein levels) were considered indicators of an infection. Cervical smears were used to evidence a stump infection. Medical reports (Carecenter Siemens®) were analysed with regard to readmission. This study was performed in accordance with the guidelines of the Declaration of Helsinki.

Statistics

Associations (spotting rate after LASH vs. eLASH, infection rate after LASH vs. eLASH and infection rate of smokers vs. non-smokers) were determined by an odds ratio (95% confidence interval) and evaluated using Fisher’s exact test. P-values < 0.05 were considered significant. Statistical evaluations were performed with SPSS 18.0.2 (SPSS Inc., Chicago, IL, USA).

Results

We had a response rate of 70% (n = 183). 88 patients from the LASH group and 85 patients from the eLASH group completed the questionnaire. The questionnaire was incompletely filled in by nine patients. The mean age in the LASH group was 46.8 years (27–50 years). The mean age in the eLASH group was 43.6 years (32–50 years). 21.6% (19/88) of the LASH group and 5.9% (5/85) of the eLASH group reported continuous spotting after the operation (p = 0.004, odds ratio “eLASH/LASH” 0.23; 95% confidence interval 0.08 to 0.64). We had a postoperative stump infection rate of 6.8% (6/88) in the LASH group and 5.9% (5/85) in the eLASH group (p = 0.999, odds ratio “eLASH/LASH” 0.85; 95% confidence interval 0.25 to 2.91). Patients with stump infections returned between three and 14 days after discharge (mean eight days). In most cases faecal germs (E. coli, enterobacteria) were identified. 34.1% (n = 30) of the LASH group and 27% (n = 23) of the eLASH group were smokers. A tendency for elevated infection rates was only found in smokers (9.4% [5/53] vs. 5.0% [6/120], p = 0.315, odds ratio “smoker/non-smoker” 1.98; 95% confidence interval 0.58 to 6.80).
Discussion

Our data confirm the efficiency of conical cervical excision. Compared to a straight resection, conical excision reduces the spotting rate by about 75%. The infection rate is not elevated. There was only a tendency for elevated infection rates in smokers (not statistically significant).

LASH is associated with low morbidity, high acceptance by patients and a shorter hospital stay [3, 4]. In cases of continuous postoperative spotting, patients are often disappointed [7, 11]. The possibility that patients who suffer from spotting may develop endometrioid carcinoma cannot be excluded [11, 12].

The corpus uteri consists of endometrial mucosa which differs from the cylindrical mucosa of the cervical channel (Fig. 1 and 3). Endometrial mucosa cells contain double-row epithelia with prominent nuclei. Cervical mucosa cells contain single-row epithelia and produce mucus. In the transition zone both types of cells coexist. The transition zone differs between individuals (Fig. 1).

Semm described a method for the vaginal excision of cervical mucosa (CURT). This procedure was thought to reduce the incidence of cervical stump carcinoma [13]. Kruczynski et al. found residual cervical cells in 68.3% cases after CURT [15]. The procedure was therefore thought to be ineffective concerning the reduction of cervical stump cancer.

There are no data available concerning the influence of CURT on postoperative spotting. The extended resection of the cervical channel might elevate the incidence of postoperative stump infections. The operation time is elongated as additional transvaginal access is necessary.

During the past few years there has been a tendency to undertake straight resection of the corpus uteri using endo-loops. Endo-loops provide a fast and easy resection, but are associated with spotting rates of up to 25%, even after concomitant coagulation of the remaining cervical channel [11]. The incomplete resection of endometrioidal cells and the regenerative abilities of the remaining cells are thought to be reasons for this elevated spotting rate [11, 12].

The conical excision of the cervical stump seems to reduce the remaining endometrioidal cells in the isthmus and cervical area and decrease spotting rates by about 75%. The remaining spotting rate of 6% confirms the hypothesis of the presence of endometrioidal cells even in the cervical wall. Our method is considered a good compromise between practicability and the remaining risk of spotting.

We expected an increase in stump infections as there is a reduced distance between the vagina and intraperitoneal space during the first two weeks after surgery. Data concerning cervical respectively vaginal stump infection after hysterectomy are rare. Compared to open or transsaginal hysterectomy, the endoscopic approach is associated with lower rates of stump infections (Table 1) [5, 6, 16–18]. Peritoneal nuture is not a relevant factor for the reduction of stump infection [19, 20]. Chang et al. could show that single-shot antibiotics are as effective as multiple-dose antibiotics (prophylactic effect 94.6 vs. 93.9%) [6]. In both groups we used single-shot antibiotics (cefuroxime and metronidazole) and sutured the cervical stump without the peritoneum. All patients received Fluomycin supp, postoperatively for two days. Both groups showed similar rates of stump infection. Overall, the rate of stump infection in our patients is comparable to the rate after complete endoscopic hysterectomy.

Several studies indicated reduced wound healing in smokers [21, 22]. We could only show a tendency for worse wound healing in our smoking patients. The absence of statistical significance may be due to the small number of patients in that group. If the tendency of elevated infection rates in smokers is confirmed, perioperative concepts should be changed for smokers.

Patients should be informed about the possibility of stump infections up to two weeks after operation [17]. In our study stump infections became clinically relevant after demission and were treated with antibiotics.

A limitation of our study is the participation rate, which was about 70%. It is possible that particularly discontent patients did not participate in the questionnaire. The problem of non-response is common and difficult to eliminate. We do not expect a relevant bias, as our collective was large and both groups concerned are similar.

Finally, there are few possible treatment strategies in cases of postoperative spotting after LASH. Hormones are a noninvasive approach is associated with lower rates of stump infections. The operation time is elongated as additional transvaginal access is necessary.

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Finally, there are few possible treatment strategies in cases of postoperative spotting after LASH. Hormones are a noninvasive
option but are often rejected by patients. Fulguration or conical laparoscopic resection of the cervical stump are invasive alternatives (Fig. 4a).

**Conclusion**

Postoperative spotting is a common problem after LASH operations. Laparoscopic excision of the cervical channel reduces the spotting rate. The stump infection rate is moderate and comparable to LASH.

There is a tendency for elevated infection rates in smokers. The information provided to patients prior to LASH operations should include accurate information about spotting and should perhaps also point out the continuous risk of endometrioidal carcinoma.

**References**