REPRODUCTIVE MEDICINE

Reproductive outcome following hysteroscopic myomectomy in patients with infertility and recurrent abortions

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Abstract

Objectives To evaluate the outcome of hysteroscopic myomectomy in patients with infertility and recurrent abortions.

Materials and methods This was a retrospective clinical analysis of 186 patients who underwent hysteroscopic myomectomy by monopolar electrode loop. A second-look diagnostic hysteroscopy was performed in all cases within 2 months. The mean follow-up period was 36.5 months.

Results The mean age of the patients was 28.4 years. The presenting clinical complaint was primary infertility in 31% (62/200) patients, secondary infertility in 10% (20/200) patients, recurrent abortions in 50.5% (101/200) and preterm deliveries in 8.5% (17/200) patients. Final reproductive outcome was assessed for 186 patients, after excluding patients with other confounding factors, interfering in pregnancy outcome.

There was a significant difference in reduction of number of miscarriages and increase in term deliveries while the number of preterm deliveries remained almost the same. Fifty-eight out of 82 infertile patients (70.7%) conceived after hysteroscopic myomectomy. The take home baby rate was increased from 16.2 to 74%. There was an increased incidence (35.6%) of cesarean section recorded in mode of delivery.

Conclusion Hysteroscopic myomectomy is a safe and effective method for improving the obstetric outcome in women with infertility and recurrent abortions and associated submucous fibroids.

Introduction

Submucous fibroids constitute 5.5–16.6% of all uterine fibroids [1]. Submucous fibroids are associated with poor reproductive outcome such as recurrent abortions and preterm births. Infertility has also been linked to submucous myomas [2]. Significantly lower rates of pregnancy with relative risk (RR) 0.32 (95% CI 0.13–0.70) and implantation, RR 0.28 (95% CI 0.10–0.72) were found in patients of submucous fibroids as compared to their infertile counterparts without fibroids [3]. The pathogenesis of infertility and repeated abortions is not clearly defined in patients with submucous fibroid. Various etiological factors proposed are interference with sperm migration and ovum transport [4], implantation failure due to decreased vascularity, endometrial inflammation and secretion of vasoactive substances [5].

Before the introduction of hysteroscopic resection of myomas by Neuwirth [6] in the 1970s, the only way to remove submucous myomas not prolapsing through the cervix was either by abdominal myomectomy or hysterectomy. These major gynecological procedures are associated with significant morbidity. Abdominal approach may compromise any future parturition as it requires cesarean section. In addition, it may lead to the development of pelvic post-operative adhesions, which may further reduce rather than enhance fertility.

With advent and evolution of endoscopic imaging and surgery during the last two decades, transcervical hysteroscopic resection of intracavitary fibroids is now treatment of choice for submucous fibroids [7]. The choice of the

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technique mostly depends on the intramural extension of the fibroid, as well as on personal experience and available equipment. 'Resectoscopic slicing' still represents the 'gold standard' technique for treating fibroids. Other effective techniques including ablation by neodymium-yttrium–aluminum-garnet (Nd:YAG) laser, morcellation and office myomectomy have been proposed [8].

The depth of penetration of a submucous myoma into the myometrium has major implications for treatment. Wamsteker et al. [9] developed a practical classification system that was adopted by the European Society of Gynecological Endoscopy (ESGE). Myomas entirely within the endometrial cavity are classified as type 0, >50% in the endometrial cavity as type I, and <50% in the endometrial cavity as type II [9]. Various criteria have been formulated to decide appropriate patient for hysteroscopic myomectomy depending upon uterine size, number of myomas, size of individual myomas and intramyometrial extension [10, 11]. Besides, being an efficacious treatment for menorrhagia, the efficacy of hysteroscopic myomectomy is clearly depicted by improved pregnancy outcome and reduced wastage.

Even though the most common indication for hysteroscopic myomectomy is menorrhagia and abnormal menstrual pattern, the present study focused to evaluate the effect of hysteroscopic myomectomy on recurrent abortions. This was a large retrospective clinical analysis of patients in whom hysteroscopic myomectomy was done using loop with resectoscope over the period of 8 years. Reproductive outcome was analyzed with respect to reduction in miscarriages and preterm deliveries and increase in live birth rate, before and after surgery. Infertile patients were assessed in terms of attainment of pregnancy.

Materials and methods

Initially a total number of 200 women affected with submucous fibroid of varying degree who presented with recurrent abortions, preterm delivery and/or infertility, were recruited from single center from January 2002 to January 2010 for the study. The inclusion criterion for this study was hysteroscopically diagnosed submucous fibroid. The exclusion criteria included presence of endocrine disease, uterine septum, intrauterine adhesions, adnexal disease and abnormal semen parameters in the husband. Women with submucous fibroids who had completed their family or were not desirous of fertility were excluded from the study. In all patients of infertility with submucous myoma, an infertility work up was done and other causes of infertility were ruled out. In all the cases, a diagnostic hysteroscopy was performed to confirm the diagnosis before recruiting the patients. The indications for

hysteroscopic myomectomy were submucous fibroid with a history of primary infertility, recurrent abortion and/or preterm delivery before 37 weeks with or without live birth.

Women with hysteroscopically diagnosed submucous fibroid less than 5 cm, less than or equal to two in number and uterine size not more than 8 weeks gravid uterus were included in the study. Written informed consent was obtained from the women before the surgery was performed. Each woman served as her own control.

Surgery was scheduled to be done in early proliferative phase. Hysteroscopic myomectomy was performed under general anesthesia for all patients by single operator (first author), experienced in operative hysteroscopic procedure. The cervix was initially dilated with Hegar's dilator up to size '10'. A 9-mm working element along with sheath and 4-mm 30° telescope (Karl Storz, Germany) equipped with a hysteroscopic monopolar loop was introduced into the uterine cavity (Fig. 1). Glycine (1.5%) was used as the distending medium through automated hysteroscopic distension pump at an inflow pressure of 70–100 mmHg. The inflow and outflow fluid volumes were measured to ensure that the difference never exceeded 1 l. Cutting current was set at 70–100 watt. The hysteroscopic loop was placed beyond the myoma and fibroid was divided in the downward direction by withdrawing the resectoscope. The resection of myoma was stopped at the point when the base of the fibroid became continuous with the rest of the endometrium. The chips were left inside the uterine cavity till the vision became blurred. The resectoscope was then withdrawn to allow the distension medium to drain and remaining chips were removed by ovum forceps. Concomitant laparoscopy was done in all cases of infertility to asses the tubal status and to overview the whole pelvis for any associated abnormality. Serum electrolyte levels were

Fig. 1 Monopolar loop in place during hysteroscopic myomectomy

checked in all patients at the end of the procedure. The occurrence of any intraoperative or postoperative complication was recorded. Postoperatively, antibiotics in the form of oral cefixime was given for a period of 5 days in all patients. Hormonal treatment was started in all patients with estradiol valerate 2 mg once daily for a period of 30 days.

In all women, a second-look office hysteroscopy was performed within 2 months of surgery to assess the normalcy of the cavity. With a fibroid <2 cm on second-look hysteroscopy, no surgical intervention was done. A repeat surgery was performed to excise a residual or recurrent myoma, which was >2 cm at original or a new site. Infertile patients were advised to try for pregnancy spontaneously. Patients who required repeat procedure were advised to resume their effort to conceive after one month from the second surgery. The duration of follow up for these patients ranged from 9 to 42 months with a mean of 36.5 months. Patients were contacted routinely and followed up every 3 months. During follow-up, the variables which were taken as outcome of this study included pregnancies including their numbers, results (live birth, miscarriages, preterm delivery <37 weeks), gestational age at delivery and mode of delivery. A comparison of reproductive outcome before and after hysteroscopic myomectomy was made. Statistical analysis was performed using Chi square test and $p < 0.05$ was considered to be statistically significant.

Results

Data were collected for 200 women with submucous uterine fibroid, with infertility, recurrent abortions and preterm delivery as the main complaint. There were 62 patients with primary infertility and 20 patients with secondary infertility. A total of 101 patients with submucous fibroid had presented with complaint of two or more recurrent abortions: 87 patients with first trimester and 14 patients with second trimester pregnancy losses. Seventeen patients had preterm delivery: seven patients had delivered between 32 and 37 weeks and ten patients delivered before 32 weeks.

Hysteroscopy had revealed presence of submucous fibroid during their work up for infertility, recurrent abortions or preterm delivery. Women with submucous fibroid for complaints other than these were excluded from study. All these 200 women were subjected to transcervical hysteroscopic myomectomy using loop in a day care setting by the single surgeon (first author).

All 200 women had a submucous fibroid confirmed by a diagnostic hysteroscopy. In 36 patients, hysteroscopy was performed after hysterosalpingogram, which revealed findings of intracavitary lesion with possibility of fibroid. In 108 women, uterine fibroid was detected first on hysteroscopy which was performed as an investigation for bad obstetric history. In 56 patients, diagnosis of fibroid was made on ultrasound which was confirmed by hysteroscopy.

Based on the ESGE classification, 118 patients had Type 0 myoma and 82 patients had Type I myoma. Twenty-two women had secondary-associated complaint of menorrhagia along with chief obstetric presentation.

Eight patients with infertility had other associated factors: husband's semen parameters were abnormal in three patients, endometriosis was associated in three patients and two patients had tubo-ovarian mass. Six women were lost to follow-up after hysteroscopic myomectomy. Hence, 186 women were included for final statistical analysis.

The operative time for the complete removal of myoma(s), as measured from the initial introduction of the dilators to the final removal of hysteroscope, varied between 22 and 32 min (mean 25.1 ± 3.5 min). The quantity of distention fluid (glycine 1.5%) absorbed by the patients varied between 190 and 670 ml (mean 430 ml). No patient had fluid overload. All patients were intended to be discharged on the same post-operative day. Intraoperative complications were encountered in seven patients. Difficult dilatation leading to cervical injury was encountered in three patients. Two patients had perforation at the end of the procedure which was managed conservatively. Two patients had excessive bleeding at the end of the procedure which was managed by the tamponade of Foley's catheter inflated with 25-ml saline introduced into uterine cavity and kept in situ for 6 h.

Postoperative hysteroscopic examination at 6 weeks follow-up demonstrated formation of mild adhesions in two women and a normal cavity with a residual/recurrent fibroid (<2 cm) in five patients (2.7%). Three patients had persistent/new fibroid, measuring more than 2 cm and required repeat myomectomy.

The patients' mean follow-up period was 36.5 months (range 9–42 months). There were total 114 live births (13 preterm and 101 at term). There was one preterm intrauterine death. Cervical cerclage was performed in three women, in whom routine second trimester ultrasonographic examination during pregnancy (18–20 weeks) suggested presence of cervical incompetence. One of these patients had encountered cervical tear during operative hysteroscopy. Cesarean section was done in 41/115 women (35.6%). Take home baby rate was markedly increased from 8.5 to 87.1% after hysteroscopic myomectomy.

Reproductive outcomes before and after hysteroscopic myomectomy are outlined in Table 1.

Though the cesarean section rate (35.6%) was high, they were done mainly for obstetric indication. Among all patients who were delivered by cesarean section, 26 (26/41;

Table 1 Reproductive outcomes before and after Hysteroscopic myomectomy

Variable	Before myomectomy $N = 186$ (136[a])	After myomectomy $N = 186$ (154[a])	P value
No. of infertile patients	44% (82/186)	12.9% (24/186)	0.024 (S)
Miscarriage before 12 weeks	69.1% (94/136)	23.3% (36/154)	0.021 (S)
Miscarriage between 12 and 24 weeks	11.7% (16/136)	1.29% (2/154)	0.001 (S)
Preterm delivery 32 and 37 weeks	5.1% (7/136)	5.1% (8/154)	No difference
Preterm delivery <32 weeks	7.3% (10/136)	3.8% (6/154)	0.218 (NS)
Term deliveries	5.1% (7/136)	65.5% (101/154)	0.001 (NS)
Intrauterine death	1.4% (2/136)	0.64% (1/154)	0.621 (S)
Live birth	16.2% (22/136)	74.02% (114/154)	0.001 (S)

N number of patients, *S* significant, *NS* not significant

[a] Number of pregnancies

63.4%) were done in emergency setting for fetal distress Forty-seven patients (15/41; 36.6%) were delivered by elective cesarean for obstetric indication or patient's choice in view of long standing infertility or bad obstetric history with current precious pregnancy. Adherent placenta was found in two patients, who were delivered by cesarean section. There were two cases of postpartum hemorrhage managed successfully with oxytocic drugs. One patient had required one unit of blood transfusion. There was no case of uterine rupture.

Discussion

Leiomyomas of the uterus are the most common solid pelvic tumors in women, and are present in around 20–25% of women aged ≥35 years. The relationship between leiomyomas and infertility and improvement of spontaneous fertility after myomectomy remains the subject of debate. The theories of pathogenic mechanism involved in poor obstetric outcome are mechanical blockage of tubal ostia impairing sperm or embryo transport through fallopian tubes, abnormal vascularisation, abnormal endometrial development, chronic intracavitary inflammation, abnormal endocrine milieu and increased uterine contractility [3].

Due to multiple confounding variables in pathophysiology of infertility and recurrent pregnancy loss, it is difficult to attribute the complaint to fibroid alone and hence decide which women shall definitely benefit from myomectomy, given the potential risks and sequelae of surgery [12]. In a large metaanalysis of 23 studies which included randomized controlled trial, it has been concluded that removing fibroids which impinge upon the endometrial cavity has a definite benefit [12]. Therefore, it is hypothesized that removal of submucous fibroid will benefit infertile women and those with repeated abortions.

Various imaging diagnostic modalities which detect uterine fibroid are transabdominal sonography (TAS) or transvaginal sonography (TVS), Hysterosalpingography

(HSG). Sonohysterography, CT scan or magnetic resonance imaging (MRI). Hysteroscopy is the "gold standard" for diagnosis of submucous fibroids [13]. Hysteroscopy and sonohysterography have both 100% sensitivity, specificity and predictive value for diagnosis of submucous fibroids [14]. All patients in present study were recruited after hysteroscopic confirmation of the diagnosis. TVS has a higher accuracy than TAS but sensitivity is still as low as 69% and positive predictive value as low as 47%. MRI has 100% sensitivity and 91% specificity [15].

Not all the fibroids need treatment. The treatment of fibroid should be tailored to presenting complaint and need of the patient. In patients with infertility and abortions, desirous of pregnancy decision for surgery should be taken only when other causes of infertility have been ruled out. If surgery is required, minimally invasive technique should be adopted with least compromise on future reproductive potential. Abdominal myomectomy is no more a preferred option due to increased risk of bleeding and subsequent intra-abdominal adhesions further compromising fertility and risk of myometrial scarring with risk of uterine rupture in subsequent pregnancy [16]. Cesarean section had to be recommended for subsequent pregnancies.

With the advent of hysteroscopic myomectomy, it is now first line treatment for submucous fibroids [17]. Various authors have suggested different criteria for hysteroscopic myomectomy to achieve more successful outcome, minimize recurrence and complication rates [9, 10, 18, 19]. The classification system given by Wamsteker and later adopted by ESGE [9] is now universally followed. The ESGE classification was followed in the present study to classify the submucous myomas. Type 0 and Type 1 myomas were recruited. Type II myomas were excluded. The most common indication for hysteroscopic myomectomy is abnormal uterine bleeding [20, 21]. Reproductive problems represent the second leading indication for intervention, though the lack of randomized studies does not allow any definitive conclusion to be drawn regarding the improvement of spontaneous fertility after hysteroscopic myomectomy [22]. The present study focused on

impact of hysteroscopic myomectomy in patients with infertility and recurrent abortions.

The operating system comprises of resectoscope with hysteroscope combined with working element which carries a unit to cut fibroid-electrosurgical or mechanical. Thermal loops, cold loops, intrauterine morcellator, vaporizing electrodes and argon, krypton and neodymium-yttrium–aluminum-garnet (Nd:yAG) lasers are various options available to remove submucous fibroid [8]. The electrosurgical system can be monopolar or bipolar. The use of a bipolar set of instruments, in which both electrodes are introduced into the thermal loop, is much safer. In this way the current will only have to pass through the tissue with which the thermal loop comes into contact, thus minimizing the danger to surrounding structures as in monopolar system. Bipolar diathermy allows the use of an electrolytic uterine distension medium (normal saline) instead of non-conducting distending solution [23]. However, it is costly and may not be cost-effective in low resource settings. To date, there is no well defined best optimum technique for hysteroscopic myomectomy. There have been various mixed retrospective and prospective observational studies to have data on clinical improvement, complications, recurrence and patient satisfaction after hysteroscopic myomectomy [8, 24]. The present study employed monopolar system and thermal loop with a 30 degree hysteroscope in a day care setting.

Ideally all operative hysteroscopic procedures should be done under laparoscopic guidance to check the integrity of uterine wall during procedure. It is proposed that in experienced hands, hysteroscopic procedure alone may be done [25]. Laparoscopy was performed in cases of complication and all cases of infertility. If the operative field has poor visibility, the procedure may be performed under sonographic guidance also [26].

Recent evidence suggests there is little advantage of administration of gonadotropin-releasing hormone (GnRH) before operative hysteroscopy in terms of short- or long-term outcomes [27, 28]. Though the GnRH administration may be beneficial in terms of resolution of preoperative anemia, decrease in fibroid vascularity and possibility of surgical scheduling. However use of GnRH analogs may be associated with increased surgical time due to loss of cleavage plane, uterine perforation due to endometrial thinning and quicker and more recurrence rates due to growth of small fibroids suppressed by GnRH [25]. In the present study, no preoperative suppression was given. There is no literature to support use of postoperative hormone suppression after hysteroscopic myomectomy which may improve fertility rates.

A post-procedural evaluation of endometrial cavity has been suggested by most authors after 6–8 weeks. HSG or a sensitive transvaginal ultrasound preferably 3D ultrasound or a second-look hysteroscopy, may be done after 6 weeks. Hysteroscopy seems to be more rational because of the ability to excise the identified fibroid remnants during the same procedure. In our study, hysteroscopy was the preferred approach to evaluate the cavity. Intrauterine adhesions after hysteroscopic myomectomy are usually insignificant [29]. Yang et al. [29] reported 1.5% uterine synechiae rate after hysteroscopic myomectomy in isolated myomas. Adhesions were encountered in two patients (1.1%) in our study after hysteroscopic myomectomy. There is little role of adhesion barrier agents such as mechanical agent (intrauterine device), fluid agents (Seprafilm, Hyalobarrier) and postoperative systemic treatment (estroprogestative treatment) after operative hysteroscopy [30]. Hormonal treatment with estradiol valerate in a dose of 2 mg per day for 6 weeks was administered in the present study. Estrogens help by induction of endometrial growth when used alone or in combination with progesterone [31]. Use of adjuvant antibiotics help in healing and reducing adhesion by prevention of infection and reduction of inflammation. All the patients in present study were given single dose of injectable antibiotic-cefotaxime 1 g before surgery followed by oral cefixime twice a day for next 5 days.

Uterine perforation, cervical laceration, intraoperative hemorrhage and fluid overload are known common complications of hysteroscopic surgeries. Hysteroscopic myomectomy is advance technique in hysteroscopic surgeries and owing to vascular nature of submucous fibroids, it may be associated with a higher complication rate. Average complication rate of 2–3% is reported in literature [32, 33]. But it may be as high as 28% [8]. Complication rate was 3.8% (7 patients) in the present study. The perforation rate should not be more than 5% in operative hysteroscopy [34]. In our study, perforation rate was 1.1% (2/186). Both the cases of perforation were secondary to difficult dilatation. If perforation is suspected or detected, especially if it is after use of active electrode it should be followed by laparoscopy and prompt management individualized to case is necessary. Both patients with perforation in present study were managed conservatively and had no intrauterine adhesions on follow-up diagnostic hysteroscopy. One of these patients with infertility had conceived and had a pregnancy which was carried to term and delivered vaginally.

Significant hemorrhage (>150 ml) was encountered in two (1.1%) patients. Both of these patients had two type I myomas. Hemostasis was achieved by balloon tamponade achieved by insertion of intrauterine Foley's catheter inflated with 25 ml of saline and left in situ for 6 h. No patient required blood transfusion. It is important to rule out perforation before insertion of a balloon catheter, because insertion of catheter can extend the tear.

Hemorrhage may also result after GnRH analog treatment due to hyaline degeneration and focal necrosis within the fibroid. Postoperative infection can also cause secondary hemorrhage.

Cervical lacerations and cervical tears are result of either forceful and difficult dilatation or due to holding with tenaculum. The bleeding is usually controlled by pressure applied with sponge holder. Tears may require suturing [35]. Three patients had cervical injury. Two patients had minimal cervical laceration due to traction of Allis forceps used to hold cervix during dilatation and one patient had cervical tear during negotiation of resectoscope. There was no significant bleeding in any of these cases. There was no postoperative infection. One of these patients with cervical tear had ultrasonographic features suggestive of cervical incompetence in her subsequent pregnancy and was applied cervical cerclage.

Though there were no other complications encountered in the present study. Other complications which are commonly encountered in hysteroscopic myomectomy may be those due to distension media such as fluid overload, electrolyte imbalance and gas embolism [35].

Hysteroscopic myomectomy has a success rate of 80–90% when done for indication of menorrhagia. There are very few randomized controlled trials to assess the effect of hysteroscopic myomectomy surgery on infertility. The largest randomized-matched control study [36] was done in 215 women to evaluate results of hysteroscopic myomectomy in infertility patients. The pregnancy rate in this study was 45% after hysteroscopic myomectomy with nearly 80% conception conceiving within 6 months of unprotected intercourse. The pregnancy rate in myomectomy group was almost double than the control group [36]. Another RCT also supports this result of removal of submucosal fibroids >2 cm carrying a significant benefit in terms of pregnancy and live birth rates. However, the sample size was limited in this study: control group: $n = 19$; myomectomy group: $n = 36$ [37]. Casini et al. [38] demonstrated in a prospective controlled study, a pregnancy rate of 43.3% in females with submucous fibroids after myomectomy against 27.2% pregnancy rate in women who did not undergo myomectomy. In a recent large systematic literature review and meta-analysis of existing studies on fibroids, it has been proposed that fertility outcomes are decreased in women with submucosal fibroids, and removal seems to confer definite benefit [12]. In the present study, 58 of 82 infertile patients conceived after hysteroscopic myomectomy giving a pregnancy rate of 70.7%. The higher pregnancy rate in the present series may be explained by exclusion of other confounding variables in infertility. However, the present study was also non-randomised and results may be biased. Fernandez et al. [39] reported in their retrospective series that the pregnancy rate was 41.6% when the fibroid was the only apparent cause, compared with 26.3% with the presence of one factor and 6.3% with two or more additional factors. More randomized controlled trials are required to establish the benefit of hysteroscopic myomectomy in infertility patients.

Though there is data in literature to support the effect of myomectomy in infertility, there is dearth of studies to clarify impact of submucous fibroids in patients of recurrent abortions and subsequent pregnancy outcome after myomectomy. A prospective study in 15 patients of recurrent abortions or preterm deliveries [40] revealed that abortion rate significantly decreased from 61.6 to 26.3%. To the best of our knowledge, present study is the largest retrospective analysis of pregnancy outcome after hysteroscopic myomectomy in patients with recurrent abortions. First trimester abortions were significantly reduced from 69.1 to 23.3% ($p < 0.05$) and second trimester abortions were significantly reduced from 11.7 to 1.29% ($p < 0.05$). Though the preterm delivery rate remained to be almost same, the term delivery rate was increased from 5 to 65.5%. Live birth rate and take home baby rate was increased almost five fold from 16.2 to 74%. This demonstrates the clear benefit of myomectomy in symptomatic as well as asymptomatic women with submucous myoma desirous of pregnancy.

Though the cesarean section rate was high (35.6%) in the present study, it was mainly the emergency cesareans for obstetric indications. In 36.6% of all cesareans after hysteroscopic myomectomy, indication was elective surgery due to precious conception after long standing infertility or recurrent miscarriages. There is no contraindication to vaginal delivery after hysteroscopic myomectomy, however cases of uterine rupture have been reported after this procedure and obstetric management should be very careful [41]. There was no case of uterine rupture in our series. However, there were two cases of morbidly adherent placenta who had postpartum hemorrhage. Adherent placenta is a known complication after hysteroscopic surgeries and specially myomectomy [42]. Both patients could be managed surgically and by oxytocics.

In conclusion, our retrospective analysis of hysteroscopic myomectomy in patients with poor obstetric history, it is clearly demonstrated the benefit in infertile patients. Present study is largest analysis to support role of hysteroscopic myomectomy in patients with preterm deliveries and recurrent miscarriages.

Conclusion

There was a significant difference in outcome ($p < 0.05$) in terms of reduction in number of miscarriages and increase

in number of viable term deliveries, and take home baby rate. Removal of submucous myoma has significant increase in fecundity in infertile patients with no other underlying cause. Hysteroscopic myomectomy using monopolar electrosurgical loop is relatively safe and cost-effective surgical procedure in low resource settings with good reproductive outcome.

Conflict of interest statement   We declare that we have no conflict of interest.

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