

CERVICAL CANAL SHAVING, INSTRUMENTAL IN IMPROVING IVF OUTCOMES

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Abstract

The passage of the transfer catheter through the cervical canal is primarily a crucial challenge for a successful embryo transfer (ET) during in vitro fertilization (IVF) cycles. Patients scheduled for IVF/ICSI are subjected to MOCK Transfer (Trial Embryo transfer), to get an idea of the cervical anatomy. It can be extremely challenging and painful to navigate a catheter through the cervix in certain circumstances. Due to cervical stenosis or blockages, which pose a significant obstacle during ET, some women experience IVF failures. Cervical stenosis refers to the narrowing or closure of the cervix at the level of the internal OS, which obstructs the passage between the uterus and the vagina. Such a disorder affects the menstrual cycle as well as pregnancy in women and requires cervical dilatation. Simple cervical dilatation may lead to re-stenosis. Such patients especially those undergoing IVF treatment are found to benefit by cervical shaving. Hence, this study aims to highlight the role of hysteroscopic cervical shaving, enabling smooth passage for ET in patients undergoing IVF, and eventually resulting in successful outcomes. This study focussed on women with a history of failed IVF attempt(s) in whom ET was extremely difficult and also those, who had failed MOCK transfer test. The study involved performing operative hysteroscopy with correction/creation of a cervical tract. Ease of postoperative ET and successful outcome of IVF treatment after the hysteroscopic procedure were observed. Cervical canal shaving resulted in a markedly easier ET and better outcome.

Keywords: Cervical stenosis; Hysteroscopy; Mock Transfer; ET (Embryo transfer); IVF (in vitro fertilization).

Introduction

Cervical stenosis (CS) indicates that the opening in the cervical cavity is narrower and in serious instances, it may be entirely closed. Cervical stenosis should be suspected if there is history of cervical surgeries or interventions or if there is difficulty in performing hysterosalpingography (HSG).¹ Cervical stenosis will lead to obstruction in passage of sperms into the uterine cavity from the vagina leading to infertility and if not corrected will complicate fertility treatment for example during intra-uterine insemination (IUI) or transfer of embryo in case of IVF.^{2,3} As in both cases IUI & in-vitro fertilization (IVF) treatment a catheter needs to be passed inside the cervix.

The smooth passage of the transfer catheter through the cervical canal is one of the most important step for a

successful embryo transfer (ET) during IVF cycles. CS is a major problem during ET. Technically, there is a decreased likelihood of conception following assisted reproductive treatments as a result of challenging ET as well as open cervical haemorrhage during ET after IVF treatment.^{4,5} Cervical dilatation (CD) has been proposed as a means to overcome difficult ET in patients with CS.^{6,7} Though, there are different modalities of treatment, hysteroscopy-guided cervical shaving is the treatment of choice, especially in patients undergoing infertility treatment. Hysteroscopes can be used as a diagnostic and surgical tool.

Diagnostic hysteroscopy was performed using a 2.9 mm rigid continuous flow operative hysteroscope with normal saline (NS) as distention media. Before performing the surgical procedure, written informed consent from the patient

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was obtained after explaining the procedure. Adequate preparation of the cervix (cervical ripening), using cervical ripening agents e.g. misoprostol (synthetic) or dinoprostone (natural), given orally or vaginally is done. Preoperative cervical preparation allows CD and reduces the potential risks of operative hysteroscopy in women going through the procedure.⁸ The patient was placed in a dorsal lithotomy position and vaginoscopy using the “no touch” technique was performed. Depending upon severity of stenosis, different methods were used. For simple stenosis, correction with forceps is tried, if rigid then scissors or Collen’s knife is used. In cases of severe cervical canal stenosis or tortuous cervical canal with hard projecting ridges, resectoscope or loop, under glycine media distention is utilised.

Materials and methods

We prepared a case series of 10 patients, whom we came across during the past three years (Jan-2020 to Dec-2022). These patients presented with a history of extremely difficult ET procedures failed IVF or had failed the Mock Transfer Test. After obtaining written consent, the patient underwent an operative hysteroscopy.

1. Out of the ten patients, three patients diagnosed with primary infertility, had failed mock transfer tests. Hysteroscopy guided, cervical canal shaving was performed using scissors & Collen’s Knife.
2. Two patients had successful mock transfer tests but encountered difficulty during the ET procedure. Hence, they underwent hysteroscopic cervical canal shaving using scissors/Collen’s knife, following which, ET was smooth during the subsequent IVF cycle leading to a successful pregnancy. It was observed that mock transfer was done using IUI cannula, which is tougher than ET cannula, hence it had passed smoothly on day two of menses but ET was difficult, as the ET cannula is delicate and transfer is done almost mid-cycle.
3. Four patients had failed IVF-ET cycles and their ET was classified as “difficult”. They were subjected to a mock transfer test on day two of their menses, which revealed obstruction/resistance at the level of Internal OS (IO). An intervention to create a cervical tract was performed with operative hysteroscopy under general anaesthesia. In two patients there was marked stenosis of the cervical canal, hence resectoscope (loop) was used to correct the same. In the remaining two Collen’s knife was used. After the hysteroscopic shaving procedure, improvement in access to the endometrial cavity during the ET procedure was achieved. Compared to earlier attempts, these patients experienced smoother ET procedures, and they were able to conceive clinically.

4. The last case was of failed IVF. The patient before IVF had undergone D&C following recurrent pregnancy loss (RPL). On Hysteroscopy, a false passage was found (most probably formed during D&C), while IO was severely stenosed (pin point), non-elastic and the cervical canal was tortuous with several projecting ridges arising from the posterior and lateral walls of the midportion of the cervical canal. Hysteroscopic cervical shaving was performed using a loop and the cervical canal was made straight with correction of stenosis.

After undergoing hysteroscopy-guided cervical shaving; all these ten patients had a smooth ET in the subsequent IVF cycle resulting in successful pregnancy.

Results

In this case series of ten patients,

1. Three patients, diagnosed as primary infertility, had failed mock transfer test. Two had successful mock transfer test but had difficulty during ET. Hysteroscopy guided, cervical canal shaving was done using scissors & Collen’s Knife. Following this procedure, they had a successful pregnancy via IVF.
2. Four patients had failed IVF-ET cycles and their ET was classified as “difficult”. They were subjected to mock transfer test on day-two of their menses, which revealed obstruction/resistance at the level of IO. In two patients 2.9 mm resectoscope was used to correct the same. In remaining two Collen’s knife was used.
3. One patient who presented after failed IVF, had history of D&C done before IVF; following RPL. On Hysteroscopy, a false passage was found (most probably formed during D&C), while IO was severely stenosed (pinpoint), non-elastic and the cervical canal was tortuous. Hysteroscopic cervical shaving was done using loop and the cervical canal was made straight with correction of stenosis. Post-procedure the patient underwent IVF at our centre with a successful pregnancy.

Discussion

Difficult ET is a subjective diagnosis as it has different definitions. Various factors that can lead to difficult ET are type of transfer catheter used, difficulty of transfer (expertise of practitioner), number of attempts and presence of mucus and blood on the transfer catheter.^{4,9,10} Given this proposed detrimental effect of difficult ET on pregnancy and implantation rates, different manoeuvres have been practised to predict and prevent technical difficulties at ET. Performing a simulated or dummy ET before the actual ET is one of recommended practices.¹¹ Ultrasound-guided ET and the use of a full bladder or tenaculum to straighten the uterine axis are useful tech-

niques, but there remains a subset of patients in whom ET is still difficult or impossible.¹²⁻¹⁴ When an ET catheter is difficult to navigate in these patients, it usually occurs at the IO level. Therefore, the only possible next step to overcoming challenging ET in these women is dilatation of the cervical OS.

CS patients or those with a history of very challenging ET operations make up a small but important subset of unsuccessful IVF cases. The literature varies on the effect of challenging ET on pregnancy rates. Research has indicated that there might be an association between a lower rate of pregnancy and challenging ET.^{3,15} In such instances, hysteroscopic guided excision/resection of cervical tissue to produce a smooth cervical tract is a novel surgical approach. CS does not return after the operation, and there is minimal bleeding during the treatment. As the process of embryo transfer (ET) becomes more straightforward, it contributes to a successful IVF cycle and increases the likelihood of a clinical pregnancy. Once the cervix is made to stay patent, the patient has a higher implantation rate.

CS has been treated with an array of treatments proposed in the past. There have been studies involving CD during oocyte retrieval as an approach to improve ET in cases of CS, but the success rate of these attempts at conception has been low.¹⁶ Another technique involves performing a whole cervix bypass and using a laparoscope to insert gametes or embryos straight into the fallopian tube (GIFT or ZIFT, respectively).¹⁷ But these procedures are more invasive, compared to hysteroscopy. As an alternative, it has also been suggested to utilize laminaria tents in specific circumstances.¹⁸ Furthermore, a transmyometrial approach to ET has been reported in individuals with CS.¹⁹ Nevertheless, transmyometrial to transcervical transfer yielded more pregnancies in patients with CS.²⁰

As in such cases the cervix is believed to be stiffer and less elastic than would be expected at the time of delivery. Thus, women who undergo this procedure should be counselled regarding potential obstetric risks.²¹

With the findings of our study, we conclude that in cases of failed mock transfer or difficult ET, hysteroscopy-guided cervical shaving should be considered for better outcomes in IVF.

It was also observed that the most common cause of difficult/failed ET in cases of IVF was CS at the level of Internal OS accounting for 50% of cases followed by cervical canal stenosis/obstructions in 40% & iatrogenic factors contributing to 10% of cases.

Conclusion

To obtain excellent success in IVF procedures, mock transfer using ET cannula should be mandatory for all patients undergoing IVF, D&C should be done cautiously and the operator

should not hesitate to use hysteroscopy, if in doubt.

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