Successful treatment of severe uterine synechiae with transcervical resectoscopy combined with laminaria tent

Fang-Ping Chen1, Yung-Kui Soong and Yu-Ling Hui

Department of Obstetrics and Gynecology, Keelung Chang Gung Memorial Hospital, 222 Mai-Chin Road, Keelung, Taiwan, Republic of China

1To whom correspondence should be addressed

Materials and methods

Patients

From July 1994 to July 1996, seven patients subsequently diagnosed with severe Asherman’s syndrome attended our clinic complaining of secondary amenorrhoea. Of these seven women, four were also complaining of secondary infertility. Physical examination was normal in every patient. Endocrine evaluation which included the estimation of follicle stimulating hormone (FSH), luteinizing hormone (LH), oestradiol, prolactin, and thyroid stimulating hormone (TSH), was also entirely normal.

Initially all were treated with a single i.m. 125 mg dose of progesterone in oil (China Chemical and Pharmaceutical Co Ltd, Taipei, Taiwan) and none noted any withdrawal bleeding. A hysterosalpingogram (HSG) was then carried out and no dye was observed to enter the uterus. At hysteroscopy using a 15.5 French gauge diagnostic rigid hysteroscope (Olympus Optical Co Ltd, Tokyo, Japan), no entry could be made into the uterine cavity nor could the uterine cavity be dilated using Hegar dilators.

A hysteroscopic classification of the severity of the disease was based on that of March et al. (1978). Intrauterine adhesions were said to be severe if they involved the whole uterine cavity, moderate if 1/4 to 3/4 of the cavity was involved but mild if less than 1/4 was involved (Table I).

Operative treatment

Insertion of laminaria tents

The tents consisted of a 6 cm length of dried kelp stalk, ~2 mm in diameter, with a string attached through a hole drilled 6 mm from the larger end (Shivata Medical Products Company, Nagoya, Japan). All patients were given prophylactic antibiotics (cefadroxil, 500 mg/capsule, one tablet twice per day) prior to the procedure. Initially only one or two laminaria tents, not more than half the length of which could be inserted into the cervix, were inserted and left in position with a vaginal gauze packing for 24 h. At the end of that time these tents were replaced with three or four new tents that could now be placed within the uterine cavity itself. After 24 h these were removed. Insertion of laminaria was performed without anaesthesia.

Hysteroscopic resection of the intrauterine adhesions

With the patient under general anaesthesia, TCR was carried out using a hystero-resectoscope with continuous flow (27 French, 9 mm outer sheath and 8 mm inner sheath, Olympus Optical Company). The adhesions were incised with a high frequency resection electrode needle (A2193, Olympus Optical Company) and 50–100 W cutting current (adjusted according to visual tissue effects) from an isolated electrosurgical generator (Valleylab SSE2L, Valleylab Inc, Surgical Products Division, Boulder, CO, USA). 10% dextrose in water was used as the distending medium. Laparoscopy was simultaneously performed to exclude uterine perforation and to assess the normality or the presence of abnormalities of the ovaries and tubes. At the end of the operation, all patients had an intrauterine device (IUD) carrying a copper load (Multiload Cu 375; Homesteel Achel P.V.B.A., Odiliaiaan, Belgium) inserted into the uterus.

© European Society for Human Reproduction and Embryology
Table I. Classification of uterine synechiae by hysteroscopic findings

<table>
<thead>
<tr>
<th>Classification</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>&gt;3/4 of uterine cavity involved; agglutination of walls or thick bands; ostial areas and upper cavity occluded</td>
</tr>
<tr>
<td>Moderate</td>
<td>1/4 to 3/4 of uterine cavity involved; no agglutination of walls–adhesions only; ostial areas and upper fundus only partially occluded</td>
</tr>
<tr>
<td>Minimal</td>
<td>&lt;1/4 of uterine cavity involved; thin or filmy adhesions; ostial areas and upper fundus minimally involved or clear</td>
</tr>
</tbody>
</table>

*Taken from March et al. (1978).

Table II. Clinical data and post-treatment results

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Factor related to amenorrhoea</th>
<th>Duration of amenorrhoea (years)</th>
<th>Post-treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32</td>
<td>elective abortion</td>
<td>1</td>
<td>pregnancy delivery</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>elective abortion</td>
<td>2</td>
<td>normal menses normal cavity</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>elective abortion</td>
<td>1</td>
<td>pregnancy delivery</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>elective abortion</td>
<td>2</td>
<td>normal menses normal cavity</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>incomplete abortion</td>
<td>1/2</td>
<td>normal menses normal cavity</td>
</tr>
<tr>
<td>6</td>
<td>31</td>
<td>incomplete abortion</td>
<td>2</td>
<td>pregnancy</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
<td>elective abortion</td>
<td>3</td>
<td>normal menses normal cavity</td>
</tr>
</tbody>
</table>

Postoperative treatment

After TCR, four doses of gentamycin (80 mg at operation plus 60 mg, every 8 h for 24 h, i.m. injection) combined with five doses of cefamezine (1 g, at operation and every 6 h for 24 h, i.v. injection) were given, and then oral antibiotics (cefadroxil, 500 mg/capsule, 1 tablet twice per day for the following 2 weeks). In addition to antibiotics, conjugated oestrogen (Premarin; Wyeth-Ayerst, Montreal, Canada) at a dose of 0.625 mg three times per day was given for 60 days. Medroxyprogesterone acetate (Provera; Pharmacia and Upjohn, Kalamazoo, USA) at a dose of 10 mg twice per day was administered for the last 7 days of this time (i.e. days 54–60) in combination with the conjugated oestrogen. After a withdrawal bleeding, the IUD was removed in the clinic. In a subsequent menstrual cycle, usually the first, but for some patients 3–5 months after the first hysteroscopy, a further hysterosalpingogram and diagnostic hysteroscopy were carried out to confirm the patency of the uterine cavity and to exclude the presence of further adhesions.

Results

These seven patients with Asherman’s syndrome had all undergone either an elective termination of pregnancy or an incomplete first trimester abortion (Table II). All had then suffered from amenorrhoea. In all seven patients, a hysterosalpingogram was initially used to diagnose their condition. This procedure outlined only the cervical canal and not the uterine cavity (Figures 1A and 2A). The presence of a narrow, short and densely scarred uterine cavity was then confirmed by diagnostic hysteroscopy.

After dilatation using the laminaria for 48 h, the uterine cavity became larger and the extensive adhesions in the lateral and fundal regions of the uterus were then able to be excised hysteroscopically.

No perforation of the uterus occurred among these seven patients, nor were there any perioperative or postoperative complications.

Consequent to the completion of the Premarin and Provera treatment, all the women menstruated normally and continued regular menstruation thereafter. Repeat hysterosalpingography showed a normal uterine cavity and patency of both Fallopian tubes (Figures 1B and 2B) in all the seven women in this study. Tubal patency was later confirmed in all women by a second hysteroscopy and laparoscopy. Four of the seven women had complained of infertility as well as amenorrhoea. One became pregnant 1 year after TCR and two others were pregnant 6 months after TCR. Those two have undergone successful delivery.

Discussion

Although the exact incidence of uterine synechiae in the female population of reproductive age is unknown, it is an infrequent cause of secondary amenorrhoea and infertility. As in the present study, it is widely accepted that induced abortion or curettage after spontaneous abortion are the main predisposing factors for the development of intrauterine adhesions. Therefore, avoidance of unnecessary curettage may prevent the occurrence of intrauterine adhesions. Dicker et al. (1996)
Treatment of severe uterine synechiae

synechiae, have been advocated in the past, including curettage and blind dissection with scissors or other instruments, and less direct abdominal approaches such as hysterotomy and synechiotomy (Raban and David, 1963; Wood and Pena, 1964; Louros et al., 1968; Comninos and Zowlas, 1969). Recently, hysteroscopy has become not only a tool for accurate diagnosis of uterine synechiae, but also a useful instrument for their treatment. Thin adhesions can be directly ruptured using diagnostic hysteroscopy; thicker adhesions require either operative hysteroscopy with flexible scissors through the sheath, hysteroscopy combined with Jako microlaryngeal scissors (Neuwirth et al., 1982) or TCR with electrocautery probe (Levine and Neuwirth, 1973). Intrauterine surgery is generally carried out using hysteroscopic scissors (Valle and Sciarra, 1986; Daly et al., 1989; Corson et al., 1992; Cararach et al., 1994) or a resectoscope (Chervenach and Neuwirth, 1981; DeCherney and Polan, 1983; Haliez and Perino, 1988; Hamou, 1991; Cararach et al., 1994). Fibre-optic light laser energy (Nd:YAG, KTP/532 or argon laser) has also been used for intrauterine operation (Daniell et al., 1987; Candiani et al., 1991). The possibility exists that electrocautery or laser may cause thermal damage to the vasculature of the myometrium, which would adversely affect the development of the endometrium (Duffi et al., 1991). Therefore, before a resectoscope is used for re-constructive purposes, the factors relating to adverse tissue effects must be considered, including resection or coagulation mode, power output, duration of exposure to electrosurgical energy and the size of the electrode. As well as causing crater formation which may impair the operator’s vision, coagulation may cause a greater area of thermal damage in the tissue when compared with cutting (Duffi et al., 1991).

Electroresection using a blended current produced a thin rim of thermal damage that was unaffected by alteration of power settings. In the in-vitro tissue studies of Duffi et al. (1991), the power settings for simulated resection (140–260 W) which induced the worst possible tissue destruction, were greater than those generally described for therapeutic application (30–110 W). Damage is likely when current is applied for increased time intervals, e.g. when the electrode is either embedded or in an area receiving repeated applications. In addition, both uterine blood flow and cooling by the continuous flow of irrigation fluid from the resectoscope will decrease the potential for thermal injury by limiting the degree of heat transmission.

Before hysteroscopy became a routine examination, diagnosis of uterine synechiae usually depended upon indirect evidence such as curettage or HSG findings in association with menstrual and/or reproductive disturbances. However, the incidence of false-positive HSG results is high (Zondek and Rozin, 1964; Levine et al., 1973). Also, neither the extent nor the severity of uterine synechiae can be established with certainty using HSG. Thus, although HSG remains an important screening procedure for the detection of uterine synechiae, hysteroscopy provides a more conclusive diagnosis and also permits a better appraisal of the extent of uterine pathology. Therefore, in the present report, all patients received HSG screening followed by hysteroscopic confirmation before and after the operation. In this report, the results of the HSG screening and hysteroscopic examinations were quite similar.

A number of mainly blind methods of treatment of uterine demonstrated that preclinical abortions did not predispose intrauterine adhesions (2.1% in 144 women) and that curettage was superfluous. In addition to minimizing the degree of trauma to the uterine cavity, early detection may prevent the deterioration of uterine synechiae as found in this study. Thus, as shown by Dicker et al. (1996), following intrauterine surgery, curettage or spontaneous abortion, hysteroscopy should be considered as an efficient means for not only the early detection or exclusion of adhesions, but also to identify the possible intrauterine pathology related to early pregnancy loss.

In this study, we suggest the use of an electrode needle rather than a loop, in order to decrease the area of tissue exposed to the current. The needle is applied in the resection mode using 50–100 W power. A number of papers have reported the successful outcome from intrauterine surgery using a resectoscope (Chervenach and Neuwirth, 1981; DeCherney and Polan, 1983; Haliez and Perino, 1988; Hamou, 1991; Cararach et al., 1994), which suggests that its proper application may not lead to significant damage. It also has been demonstrated that there is no difference between the use of scissors and resectoscope (Cararach et al., 1994). In comparison with the use of hysteroscopic scissors, electrosurgery provides greater simplicity as well as improved optical clarity of the operative field due to the double irrigation/aspiration channels of the resectoscope.
Use of the resectoscope is particularly advantageous when the tissue is very firm and dense, as in the present cases.

Procedures that use electrosurgical devices require a non-electrolyte solution as distending medium, specifically glycine, sorbitol, and 5% or 10% dextrose in water. If large quantities of these non-electrolyte solutions become absorbed during prolonged operation, there is a serious risk of water intoxication. Additionally, unique problems may arise such as urea formation from glycine, resulting in irreversible encephalitis. Sorbitol is the safest of the non-electrolytic solutions, but may lead to a loss of visual clarity. Regardless of the distending medium selected for resectoscopy, it is most important to control both flow rate and intrauterine pressure and to minimize the risk of water intoxication. In this study, 10% dextrose water was used since it is not only an extremely useful, inexpensive medium but also routinely used in our unit. The input and output volume of medium are carefully monitored and the operation is terminated if the fluid deficit becomes >1 litre.

When the scar tissue is dense and appears either to be continuous with the uterine wall or to totally block the endocervix or isthmus, as in our present study, there may be insufficient space in the uterine cavity for the application of operative hysteroscopy or TCR. Forcible dilatation of the cervix may lead to cervical damage, laceration or uterine perforation. In the present cases, the scar tissue was too dense to be dilated by Hegar dilators. Therefore, gentle and gradual dilatation of the cervical canal was carried out using a laminaria tent, which has frequently been considered to facilitate a second trimester abortion. After insertion of a laminaria tent into the cervix, it absorbs fluid and gradually swells. This results not only in a soft cervix, but also in an increase of space in a severely scarred uterine cavity. Thus, TCR with an electrocautery needle can be used to dissect the adhesions from scars of the central dome to scars in the lateral aspects of the cavity. During the insertion of the laminaria tent, two patients, nos. 5 and 7, complained of a sudden onset of abdominal pain which was relieved spontaneously and quickly. At operation, their previously short and narrow uterine cavity was found to have become wider and longer. We believe that, in addition to dilatation of the cervical canal, the progressive swelling of the laminaria tent may have partially dissected intrauterine adhesions inducing the sudden onset of low abdominal pain. During the intensive dilatation of a narrow scarred uterine cavity using three or four laminaria, it is possible for the cervix to become over-dilated. However, the size of cervix can be controlled using a single-tooth vulsellum tenaculum, thus preventing the outflow of distending medium.

Using the hysteroscope to evaluate the surgical field can be misleading, as the working distance from objective lens to tissue is short, thus magnifying the field and limiting the surgeon to small-angle views. It is also crucial to be aware that the myometrial thickness may be 1 cm or less, and that the cornual areas may be even thinner. As reported by Corson (1992), concomitant laparoscopy is often employed, particularly if adhesions are dense and lateral, because lateral perforation is more likely to cause significant bleeding than central perforation. For these reasons, as well as to reduce the potential for accidental perforation, simultaneous laparoscopy is a good protective measure during the course of major hysteroscopic intervention, especially in cases of complex uterine synechiae and submucosal myoma treatment. No complications of uterine perforation were noted in the cases reported here. In addition to submucosal myoma, simultaneous laparoscopy and electrosurgery for intrauterine adhesions have also been reported (Levine and Neuwirth, 1973) as performed in this study. Laparoscopy is also indicated if infertility is a problem because of the possible involvement of the Fallopian tubes. Ultrasonography is an alternative to simultaneous laparoscopic monitoring of operative hysteroscopy (Ohl and Bettahar-Lebugle, 1996), and may also predict surgical and clinical outcome in women with severe uterine synechiae (Schlaff and Hurst, 1995). However, echogenically dense scar tissue and a small distended intrauterine field may cause difficulties in identifying the tip of the electrode needle in the indirect visual image produced by ultrasound. The development of gynaecoradiological uterine resection under radiological monitoring (Gleicher et al., 1995) may provide another approach for intrauterine lesions in the future.

The ideal treatment of uterine synechiae consists of not only removing the adhesions, but also preventing the formation of new ones. Maintenance of a patent uterine cavity and enhancement of rapid endometrial growth are generally accepted methods of preventing the recurrence of uterine synechiae. Sugimoto (1978) suggested that after adhesiolysis by therapeutic hysteroscopy, insertion of an IUD was unnecessary in cases of mild or new adhesions. However, if the adhesions were extensive it might be necessary to use an IUD for a variable length of time, proportional to the degree of severity. Since the area of transected scar is extensive in severe uterine synechiae, the use of oestrogen to induce endometrial growth and the insertion of an IUD to prevent fresh adhesions are currently recommended by most surgeons (Jewelewicz et al., 1976; Corson, 1992). Today, the IUD has gained its rightful place among the methods utilized to prevent formation of re-adhesions and many types of IUD have been recommended, including the special ‘Massouras Duck Foot’ (Massouras, 1974) and the Y-shaped IUD (Schenker and Margalioth, 1982). However, it is important to minimize the risk of infection related to the insertion of IUD, so prophylactic antibiotics should be used. Furthermore, the dose and the duration of oestrogen are still subject to debate, since a range of 1.25–2.5 mg conjugated oestrogen for 30–60 days has been reported. In our experience, effective management can be achieved with 0.625 mg conjugated oestrogen three times per day administered for 60 days.

In conclusion, although the series is small and the follow-up interval brief, the management of severe uterine synechiae with a laminaria tent and TCR has proven to be a safe and appropriate treatment for the problem.

References
Treatment of severe uterine synechiae


Received on November 4, 1996; accepted on March 4, 1997