

NOVEL ADJUNCTIVE TREATMENT FOR CERVICAL ADHESION WITH CROSS-TYPE NELATON CATHETER: A PRELIMINARY REPORT AND LITERATURE REVIEW

Jen-Ching Lin¹, Yun-O Chen¹, Chi-Chen Chang², Yao-Yuan Hsieh^{2,3,*†}

¹Department of Obstetrics and Gynecology, Lin Shin Hospital, ²Department of Obstetrics and Gynecology, China Medical University Hospital, Taichung, and ³Department of Biological Science and Technology, National Chiao Tung University, Hsinchu, Taiwan.

SUMMARY

Objective: Intrauterine adhesion remains a common complication post dilatation and curettage (D&C) in reproductive females. Internal cervical orifice adhesion (ICA) is also observed incidentally after D&C. Here, we introduce a novel adjunctive management for ICA with cross-type nelaton catheter.

Materials and Methods: In this study, 20 patients suffering from amenorrhea and ICA after D&C were included. All individuals underwent flexible hysteroscopy to confirm their simple ICA statuses. All women accepted the insertion of simple cross-type nelaton catheter. Two weeks post insertion, the catheter was removed and a second-look hysteroscopy was performed. Three months post catheter removal, the menstruation statuses and the efficiency of nelaton catheter in preventing ICA were evaluated.

Results: Nineteen patients had 3-month follow-up. Seventeen individuals (89.4%) had normal menstruation flow as well as the impact internal orifice of cervical canal. Only two patients (10.5%) had hypomenorrhea and fibrotic narrowing of the internal orifice of the cervix, which required resectoscopy to remove the internal cervical adhesions. All patients appeared the competence of endurance for these procedures.

Conclusion: The novel cross-type nelaton catheter is a simple, well tolerated, and highly effective method for the management of ICA after D&C. [*Taiwanese J Obstet Gynecol* 2007;46(1):38–42]

Key Words: flexible hysteroscope, intracervical adhesion, intrauterine adhesion, nelaton catheter

Introduction

Intrauterine adhesion (IUA), also named Asherman syndrome, was recognized as a major factor contributing to infertility and menstrual disorder in reproductive population [1]. It arises from trauma to the pregnant uterus, such as repeated dilatation and curettage (D&C)

procedures. Symptomatology ranges from normal menstruation, through hypomenorrhea, to amenorrhea [2] as well as infertility and obstetric complications [3]. Internal cervical orifice adhesion (ICA) is another sequela post D&C. Like IUA, ICA remains a troublesome problem for both doctors and patients. Its symptoms, similar to IUA, include amenorrhea and hematometria.

Currently, lysis of adhesions with D&C or transcervical resectoscopy and resection/adhesiolysis (TCR-A), prevention of subsequent adhesions with intrauterine device (IUD), and maintenance of the uterine cavity with hormone therapy have been adopted as major principles in the management of IUA [4]. A well-maintained uterine cavity is the prerequisite for prevention of subsequent

†Jen-Ching Lin and Yao-Yuan Hsieh contributed equally to this work.

*Correspondence to: Dr Yao-Yuan Hsieh, Department of Obstetrics and Gynecology, China Medical University Hospital, 2, Yuh-Der Road, Taichung, Taiwan.

E-mail: d3531@yahoo.com.tw

Accepted: January 18, 2006

adhesion formation. IUD, the popular method for contraception, has been advent for decades. The placement of IUD for 3 months in IUA individuals has been the standard method of maintaining the uterine cavity [5]. The concomitant usage of sequential estrogen and progesterone is essential for the endometrial regrowth as well as the prevention of the adhesion recurrence [2]. Although IUD is considered as the golden intervention for preventing IUA, it might be limited in ICA individuals for its short vertical arm without the involvement of cervical canal.

The use of an inflated pediatric Foley catheter in the uterine cavity instead of an IUD to mechanically maintain the uterine cavity separated after adhesiolysis has been reported with equally good results but with much fewer complications [6,7]. Another attractive point of catheter management in IUA is its short placement period for 10 days only [8]. Despite abundant reports on the management of IUA, few reports deal with the related issues for ICA. Furthermore, there are no reports involving the use of catheter-like device for the treatment of ICA. In this survey, we applied a novel nelaton catheter in the management of ICA. With the simple cross-type nelaton catheter, we performed a clinical trial to test its clinical value. To the best of our knowledge, this is the first report on this application.

Materials and Methods

A total of 20 premenopausal Taiwanese women in Lin Shin Hospital were included in this study. All individuals accepted detailed history taking as well as detailed ultrasonography and flexible hysteroscopy examination. Cervical adhesion with fibrosis membrane ($n = 18$) and band ($n = 2$) around internal cervical orifice was confirmed. The diagnosis criteria for ICA included: (1) no menstruation after D&C; (2) only cervical adhesions at internal orifice; and (3) no adhesions in intrauterine cavity proved by flexible hysteroscopy. All examinations and management were performed by the same surgeon (Lin). The experiment was approved by the Ethical Committee and Institutional Review Board of Lin Shin Hospital.

The diagnostic fiberoptic hysteroscope (3.7 mm in outer diameter) was used to evaluate the intracervical and uterine conditions [9,10]. Hysteroscope was introduced very gently into the cervical canal under direct visualization. There were different presentations of ICA, which could be identified clearly under hysteroscopy (Figure 1). After the confirmation of ICA, the cervical adhesions were simply penetrated and dilated through cervix only with Hegar dilator no. 1–3. Then flexible hysteroscope was advanced again into the uterine cavity

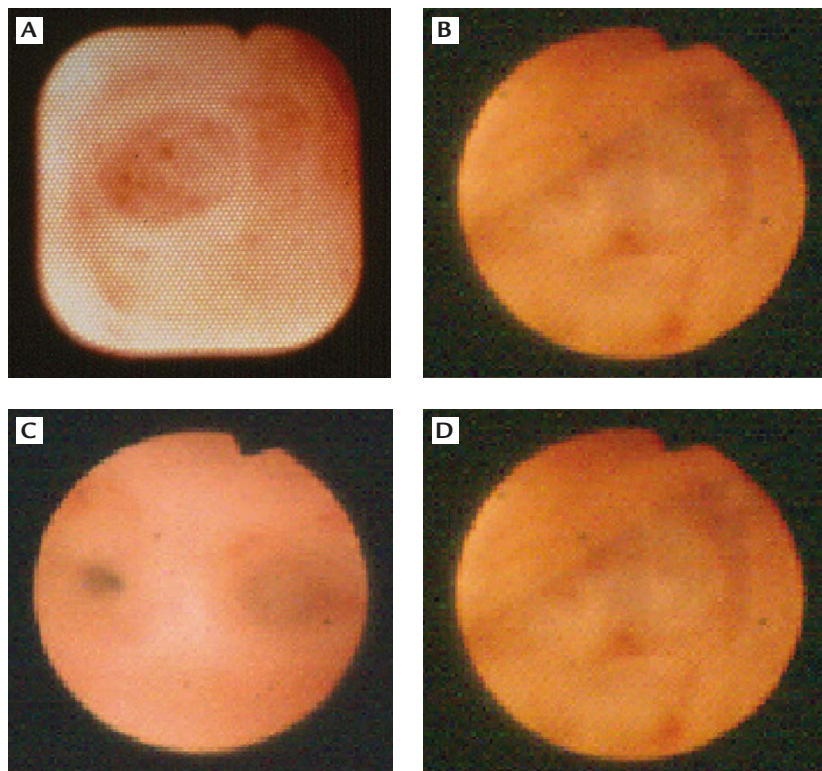


Figure 1. Different types of internal cervical orifice adhesions under flexible hysteroscopy: (A) volcano-like cervical adhesion; (B) diffuse membrane-like cervical adhesion; (C) central band-like cervical adhesion; (D) oval-like membrane cervical adhesion.

to ascertain the nonadhesion statuses of the uterine cavity. Our novel adjustment of the cross-type nelaton catheter consisted of a transverse arm 2 cm and scissors a central hole in the middle to let the 4 cm vertical arm pass through, and suture tied with a silk thread at the end of the vertical arm for pulling out during removal (Figure 2). After the cervical orifice dilation and adhesiolysis, a cross-type nelaton catheter was held by a forcep and pushed into the uterine cavity. Then it was pulled back gently to let its transverse arm stay at the lower uterine cavity near the internal orifice area.

After 2-week placement, the cross-type nelaton catheter was removed easily by pulling the silk thread. A second-look examination of cervical orifice with hysteroscopy was performed in all individuals. All hysteroscopy examinations, penetration/dilation of cervical adhesion, and insertion/removal of nelaton catheter were performed easily. Neither analgesia nor anesthesia was required during the cervical dilation and catheter insertion/removal. Prophylactic antibiotics (ampicillin 500 mg q6h for 3 days) were administered after cervical dilation and lyses of adhesion bands. Three months post catheter removal, the menstruation statuses of all individuals were recorded. The recurrent rates of ICA and efficiency of the cross-type nelaton catheter were evaluated. The following statuses of fertility were also recorded.

Results

There were 19 patients who accepted the 3-month follow-up. One patient did not come back for the

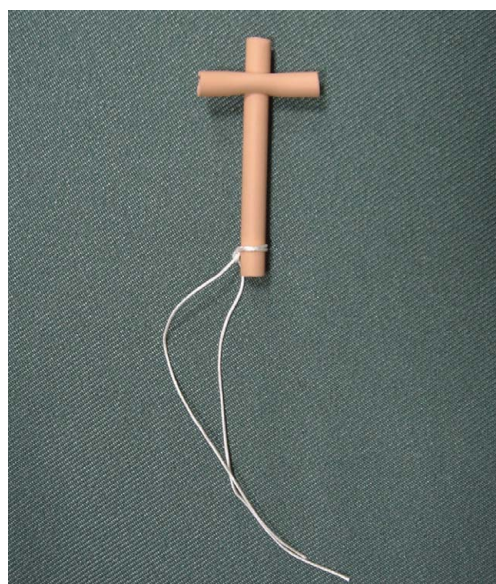


Figure 2. Cross-type nelaton catheter, transverse arm 2 cm in length, vertical arm 4 cm in length, and silk thread tie or suture at the end of the vertical arm.

menstruation evaluation. Among these 19 patients, 17 (89.4%) appeared to have normal menstruation flow. Their hysteroscopy examination showed the patent and impact cervical canals. Only two patients (10.5%) had hypomenorrhea and fibrotic narrowing of the internal orifice of the cervix, which required resectoscopy to remove the internal cervical adhesions. Among these 20 patients, two had their catheter slipped outside of the uterus several days later without the patients knowing, which required secondary nelaton catheter insertion.

All patients appeared the competence and endurance for these procedures. The cross-type nelaton catheter could be removed easily by pulling the silk thread. Only one cross-type nelaton catheter had a broken thread after the 2-week placement. This catheter was removed easily with the micro grasping forceps of operating flexible hysteroscope [9]. We also observed high fertility rates in some females post nelaton catheter placement. As many as six cases became pregnant around 2–6 months post catheter removal, and one pregnant case was noted 14 months post-treatment.

Discussion

IUA, with an incidence of 2–5%, remains an important uterine factor in the etiology of female infertility [11,12]. The commonest modes of presentation were secondary amenorrhea and hypomenorrhea in 51.8% and 42.0% of patients, respectively [8]. Most IUAs develop following curettage for evacuation of an incomplete spontaneous abortion and elective termination of pregnancy [8]. The natural softness of the pregnant uterus is predisposed to over manipulation and increased depth of curettage, which provokes the denudation of the basal layer of the endometrium and the consequent loss of the regenerative mechanism. The inflammation reaction post curettage might facilitate the occurrence of infection as well as promote increased fibroblastic activity and collagen formation before endometrial regeneration [13]. It is generally suspected that ICA results from similar consequences as IUA. The curettage manipulation might also induce the adhesion process of internal cervical orifice or canal, which would result in ICA formation.

Traditional management of IUA consisted of blind lysis of adhesions with uterine sound, dilatation, or curettage [14]. The ideal treatment of IUA or ICA consists not only of physically removing the adhesion but also preventing new adhesion formation by the use of intervention devices. Therapeutic dilatation, insertion of an IUD, and enhancement of endometrial growth with cyclical estrogen/progestogen regimen for

2 to 3 cycles are principal managements for IUA or ICA [12]. The placement of IUD or pediatric Foley catheter balloon in the freshly separated uterine cavity is the common adjunctive approach for the maintenance of the separated uterine cavity for subsequent endometrial regeneration [7,15]. The overall outcome of treatment using the two methods, the IUD and Foley catheter balloon, to maintain the uterine cavity separated was good as evidenced by the attainment of around 70–80% return of normal menstruation and a pregnancy rate of 30.9% [8]. Furthermore, Orhue et al [8] demonstrated that the Foley catheter is a safer and more effective adjunctive method of treatment of IUA compared with IUD. Its cheap and accessible approach provides another management of IUA as well as ICA. Foley catheter balloon appears to achieve a greater and more effective separation of the uterine cavity or cervical canal because of the larger surface area during endometrial regeneration [16]. This advantage shortens the placement period compared to that of IUD. However, the efficiency and effectiveness of the catheter device have not been tested in the individuals with ICA.

IUDs string in cervical canal might prevent cervical adhesion. However, the string of IUD could not provide the adequate separation of cervical canal. In fact, except for its low displacement, the short vertical arm of IUD was not involved the whole cervical canal. In this survey, the idea of nelaton catheter device was also derived from IUDs structure. Our adjustment of the longer vertical arm, which involved the whole cervical canal, provides a better prevention of ICA recurrence post dilation and adhesiolysis. The catheter also provides the patent route, which prevent the intrauterine blood retention. Furthermore, the transverse arm of the cross-type nelaton catheter enables the better fixation of the device in the uterine cavity, which prevents its following low-displacement, slipping, or expulsion during 2-week placement. Other advantage of our device is its relative economics as well as shorter placement period in cervical canal to prevent the adhesion recurrence. Furthermore, the efficiency of the novel cross-type catheter in prevention of ICA recurrence was around 82.4%, which was higher than that of IUD in IUA individuals.

Both hysteroscopy and hysterosalpingography (HSG) are useful in the diagnosis of IUA [14]. Hysteroscopy is the most cost-effective means of diagnosis, classification, and treatment for IUA [12]. HSG is a relatively inexpensive procedure that provides important information about the region of the internal os, the uterine cavity, and the entire course of the fallopian tubes. In this survey, we applied the hysteroscopy in the diagnosis and following-up of ICA. The different presentations and the

severity of ICA could easily be identified and differentiated under hysteroscopy examination. It is also useful in the evaluation and exploration of the missing or broken-thread catheter.

In this pioneer study, we observed that nelaton drain placed in cervical canal for 14 days is enough to maintain the canal patency and prevent recurrent adhesion. The evaluation of cervical condition with flexible hysteroscopy is feasible and favorable in such situation. It is also interesting to observe the high fertility rates in the recruited females post treatment. As many as 36.8% (7/19) females who accepted the nelaton catheter management became pregnant within 14 months. It suggested that the closed cervix might be a major factor in the disruption of sperm-oocyte recoupling, which might contribute to the infertility.

Based on the experience obtained from this pioneer survey, we confirmed the efficiency and safety of this novel adjustment of cross-type nelaton catheter in the management of ICA. Our preliminary result proposed that the novel cross-type nelaton catheter is a simple, useful, effective, well tolerated, and economic method for the management of ICA after D&C. Our novel design might also be beneficial for the future development of commercial device for preventing ICA.

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