ALTERNATIVE TREATMENT FOR INFERTILE PATIENTS WITH PROXIMAL TUBAL OBSTRUCTION

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Abstract

Introduction Proximal tubal obstruction accounts for 10-25% of tubal infertility. In the past reconstructive microsurgery was the only treatment option. Currently, tubal cannulation under hysteroscopic or radiologic control is performed both to confirm the diagnosis and recanalize the obstructed tubes. In this report, we present our preliminary experiences with hysteroscopic tubal recanalization of proximal tubal obstruction.

Method Hysteroscopic tubal cannulation was performed in 11 infertile women with proximal tubal obstruction, as diagnosed by laparoscopic chromopertubation. Successful cannulation and pregnancy rates were analysed.

Results The average age and duration of infertility was 31.2±3.4 and 4.1±2.0 years, respectively. The success rate of tubal cannulation was 66.7% of tubes (12/18) and 72.7% of patients (8/11). There was no immediate complication. The pregnancy rate was 27.3% per attempted patient. No ectopic pregnancy was observed.

Conclusion Hysteroscopic tubal cannulation was a safe and simple procedure. It had no radiation risk and was well-tolerated by the patients. The procedure should be offered as a first-line therapy for patients with proximal tubal obstruction and otherwise normal tubal appearance. Chiang Mai Med Bull 2006;45(3):113-118.

Keywords: proximal tubal obstruction, hysteroscopic cannulation
alpingography (HSG), laparoscopic chromoper-
tubation and hysterosonography.

In the past, most cases of proximal tubal
obstruction were treated by microsurgery.
Radiographic approach (selective salpingogra-
phy) to correct proximal tubal obstruction was
introduced in 1977\(^5\) and transcervical cath-
terization under fluoroscopic guidance was
first reported by Platia and Krudy in 1985.\(^6\)
Since then, many physicians have attempted
transcervical recanalization of proximal tubal
obstruction by using different kinds of instru-
ments, such as coaxial catheter,\(^7,8\) balloon
dilator,\(^9,10\) Jansen-Anderson catheter\(^11\) and
guide wire.\(^12\) The first term birth after hyst-
eroscopic tubal catheterization was reported
by Daniell and Miller in 1987, after using a
urologic ureteric catheter.\(^13\) By a similar ap-
proach, hysteroscopic hydrotubation with gen-
tamicin, hydrocortisol and hyaluronidase was
used to treat tubal blockage.\(^14\) Gonadotropin
releasing hormone agonist (GnRH-a) has been
introduced to treat PTO from estrogen-sensi-
tive disorders, such as adenomyosis, endome-
triosis, cornual leiomyoma and endosalpingio-
sis.\(^4\) At present, assisted reproduction
technology (A.R.T.) plays an important role in
the treatment of these patients. However, the
cost and complexity of A.R.T. prevent its
accessibility to a wider population of patients.

In summary, successful catheterization has
been employed with different catheters under
fluoroscopic, hysteroscopic, fallopionic and
sonographic guidance.\(^5\) The purpose of this
report was to present our preliminary experiences
with hysteroscopic tubal cannulation in 11
infertile patients with proximal tubal obstruction.

Materials and methods

Diagnostic laparoscopy was routinely
performed to exclude a tubo-peritoneal cause
of infertility. Patients with normal tubal
appearance, but no spillage of methylene blue
on chromopertubation, either unilaterally or
bilaterally, were candidates for hysteroscopic
tubal cannulation. A flexible or rigid hystero-
scope (Storz) was inserted through the cervi-
cal os. The tubal ostium was identified, and
cannulation of the obstructed tube was
attempted. A plastic hysteroscopic cannula
(GIFT embryo transfer catheter) was passed
through the ostium into the tube for a distance
of approximately 1 centimeter. Methylene blue
was injected through the cannula and dye
spillage was noted by the laparoscope.

Patients were asked to come back one
week after the procedure for a follow-up visit.
Operative findings and a treatment plan were
then discussed with the couples.

Patient records were reviewed in June
2002, and letters were sent out to ascertain
the result/outcome of treatment in those who
were lost to follow-up.

Results

Eleven cases with proximal tubal obstruc-
tion were diagnosed by laparoscopic chromo-
pertubation from November 1994 to June 2000
and included in this study. Their average age and
duration of infertility was 31.2±3.4 and 4.1±2.0
years, respectively. Nine cases had primary and
two secondary infertility. Tubal obstruction was
bilateral in 7 cases and unilateral in 3. One case
had unilateral proximal obstruction of the single
remaining tube (Table 1).

Both tubes were successfully recanalized
in 4 of the 7 cases with bilateral obstruction.
The operation was successful unilaterally in 2
cases and failed completely in 1 case.

For patients with unilateral obstruction, the
operation was successful in two cases, but
failed in the other 2 (Table 1).
The overall success rate of recanalization was 12/18 tubes (66.7%) or 8/11 patients (72.7%).

Spontaneous pregnancy occurred twice in one case with successful bilateral cannulation; once in 1 case of successful unilateral cannulation of bilateral obstruction; and once in one case of successful cannulation of the unilateral obstruction. The duration from successful cannulation to pregnancy ranged from 2 to 16 months. One case, who had successful bilateral cannulation, was found to have recurrent proximal tubal occlusion on hysterosalpingography one year later. Three patients underwent treatment with assisted reproductive technology, and one pregnancy was obtained. One case with successful recanalization of the unilateral obstruction had empirical treatment with clomiphene citrate for superovulation, but no pregnancy resulted. Three patients were lost to follow-up after tubal recanalization.

### Table 1. Summary of all patients and their treatment results/outcomes

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Length of infertility</th>
<th>PTO</th>
<th>Success R/L</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32</td>
<td>3</td>
<td>Bilateral</td>
<td>+/-</td>
<td>IUP x2</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>4</td>
<td>Bilateral</td>
<td>+/-</td>
<td>Recur</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>7</td>
<td>Unilateral</td>
<td></td>
<td>ART</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>7</td>
<td>Bilateral</td>
<td>+/-</td>
<td>Loss</td>
</tr>
<tr>
<td>5</td>
<td>34</td>
<td>5</td>
<td>Bilateral</td>
<td>+/-</td>
<td>Loss</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>2</td>
<td>Bilateral</td>
<td>+/-</td>
<td>IUP</td>
</tr>
<tr>
<td>7</td>
<td>27</td>
<td>3</td>
<td>Unilateral</td>
<td>+</td>
<td>OI</td>
</tr>
<tr>
<td>8</td>
<td>29</td>
<td>6</td>
<td>Single</td>
<td></td>
<td>ART</td>
</tr>
<tr>
<td>9</td>
<td>32</td>
<td>1</td>
<td>Bilateral</td>
<td>+/-</td>
<td>Loss</td>
</tr>
<tr>
<td>10</td>
<td>33</td>
<td>5</td>
<td>Unilateral</td>
<td>+</td>
<td>IUP</td>
</tr>
<tr>
<td>11</td>
<td>35</td>
<td>6</td>
<td>Bilateral</td>
<td>+/-</td>
<td>ART</td>
</tr>
</tbody>
</table>

+ = success; - = failure, IUP = Intrauterine Pregnancy, OI = Ovulation Induction, ART = Assisted Reproduction Technology

### Discussion

Miyazaki et al. reported that hysterosalpingography (HSG) could cause tubal spasm. Selective hydrotubation using hysteroscopes revealed patent tubes in 72 out of 134 cases with tubal occlusion, diagnosed by HSG. Sulak et al. reported that 6 of 18 cases (33%) with proximal tubal occlusion (PTO) diagnosed by HSG, had retained amorphous substance in tubal lumen, but three cases (3/18 or 17%) had normal tubes. Although falloposcopy is currently a reliable procedure for diagnosing PTO, it is costly and also requires a lot of training and experience. Differentiation between true pathologic tubal obstruction and functional tubal spasm on HSG is essential, as it implies different types of treatment. Tubal catheterization and dye injection are used not only to confirm diagnosis, but also to treat proximal tubal obstruction.

The success rate of hysteroscopic cannulation during laparoscopy or laparotomy was
The success rate of 66.7% in our study was slightly lower than that in previous reports. In our series, we had four spontaneous pregnancies in 3 of the 11 attempted cases (27.3%) and all were intrauterine pregnancies. Das et al. reported a pregnancy rate of 71.4% in their series,\textsuperscript{(20)} which was in contrast to the 14% (7/50) in a similar study by Lei et al.\textsuperscript{(14)} A meta-analysis by Honore et al. reported an average ongoing pregnancy rate of 50.4% (range 43%-71%).\textsuperscript{(5)} The difference in pregnancy rates may be explained by the variation in techniques and operative skills, as well as different follow-up durations.

Complications such as tubal and uterine perforation, heavy bleeding and infection are possible after tubal recanalization.\textsuperscript{(13)} We did not observe any of these complications, possibly because a soft and flexible plastic cannula was used in our study. The drawback was that a soft cannula gave a higher failure rate for tubal recanalization. In a meta-analysis by Honore et al., the average ectopic pregnancy rate was 4%.\textsuperscript{(5)} Unfortunately, we did not have enough cases to make any conclusions on the occurrence of this condition.

In terms of cost, hysteroscopic cannulation for proximal tubal occlusion is cheaper than conventional treatment. In our hospital, a typical case costs 3,000 baht for laparoscopic procedure and related medication, plus another 2,000 baht for hysteroscopy. The cost of a cannula is around 2,000 baht, but it is reusable. In fact, all 11 patients in this report used the same cannula for recanalization of their proximal tubes. In contrast, exploratory laparotomy costs 7,500 baht (cost of operation plus medication and suture materials) plus 4,000 baht for general anesthesia. In addition, the patient would have to pay for a hospital bed and nursing services during an admission of 3-5 days. If the patient chooses to undergo \textit{in vitro} fertilization (IVF) treatment, the total cost would be approximately 50,000 baht per cycle.

Our findings suggested that hysteroscopic tubal cannulation should be considered as an initial treatment for PTO because it is safe and simple. There is also no risk of radiation exposure to the patients. Further study, involving a larger number of patients, should be carried out before this procedure can be recommended as a first-line treatment for proximal tubal obstruction.

\textbf{References}

ทางเลือกในการรักษาผู้ป่วยมีบุตรยากที่ท่อนำไข่ส่วนตนอุดตัน

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บทคัดย่อ
บทนำ
ท่อนำไข่ส่วนตนอุดตันเป็นสาเหตุร้อยละ 10-25 ของปัญหาความผิดปกติของท่อนำไข่ในผู้ตั้งครรภ์มีบุตรยาก ในอดีตมีการรักษาเพียงวิธีเดียวคือ การผ่าตัดจุลศัลยกรรมของท่อนำไข่ แต่ปัจจุบันมีการรักษาด้วยการแยงท่อนำไข่ผ่านทางโพรงมดลูก โดยอาศัยวิธีทางรังสีหรือทางการเจาะส่งในโพรงมดลูกในบางกรณี ไม่สามารถจะนำมาประสบการณ์ข้อเสนอในการรักษาภาวะท่อนำไข่ส่วนตนอุดตัน โดยการแยงท่อนำไข่ผ่านทางโพรงมดลูก

วิธีการศึกษา
ในทั่วไปการศึกษาผู้ป่วยมีบุตรยากจำนวน 11 ราย ที่ได้รับการรักษาโดยวิธีทางการแยงท่อนำไข่ส่วนตนอุดตัน จากการเจาะโพรงมดลูกโดยการใช้กล้องส่อง

ผลการศึกษา
ผู้ป่วยมีอายุเฉลี่ย 31.2 ± 4.4 ปี มีภาวะมีบุตรยากเฉลี่ย 4.1 ± 0 ปี ท่อที่มีภาวะท่อนำไข่ส่วนตนอุดตันมีผลสำเร็จในร้อยละ 66.7 (12/18) ของท่อที่มีภาวะท่อนำไข่ส่วนตนอุดตัน มีภาวะมีบุตรยากเฉลี่ย 4.1 ± 0 ปี ท่อที่มีภาวะท่อนำไข่ส่วนตนอุดตันมีผลสำเร็จในร้อยละ 66.7 (12/18) ของท่อที่มีภาวะท่อนำไข่ส่วนตนอุดตัน

สรุป
การรักษาท่อนำไข่ส่วนตนอุดตัน โดยการแยงท่อนำไข่ผ่านทางโพรงมดลูกเป็นวิธีการที่มีประสิทธิภาพในการแก้ปัญหาท่อนำไข่ส่วนตนอุดตัน มีคุณภาพในการรักษาที่เหมาะสม สามารถช่วยแก้ไขปัญหาที่เกิดขึ้นได้อย่างมีประสิทธิภาพ ไม่มีความเสี่ยงต่อชีวิตของผู้ป่วย

คำสำคัญ: ท่อนำไข่ส่วนตนอุดตัน, แยงท่อนำไข่ผ่านทางโพรงมดลูก