Transcervical Falloscopic dilatation of proximal tubal occlusion. Is there an indication?

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Introduction

Up to 25% of female infertility is due to proximal tubal occlusion (PTO) (Sulak, 1987). Possible reasons for an occlusion are the salpingitis isthmica nodosa, endometriosis, polyps, pelvic inflammatory disease (PID), intratubal adhesions and plugs (Fortier and Haney, 1985; Wiedemann et al., 1987; Kindermann et al., 1987).
Figure 1. Example of a plug removed during tubal dilatation. This patient had a history of 8-year infertility and bilateral PTO. Immediately after successful transcervical dilatation of one tube (one side successfully recanalized and removal of the plug and contralateral perforation without recanalization) the patient conceived, delivered a healthy child and 18 months later conceived again.

For the therapeutic approach it is important to distinguish between non reversible (e.g. fibrotic stenosis), reversible obliteration (plugs) (Figure 1) and simple spasm. Sulak (1987) found no signs of disease in 60% of proximal tubal segments resected for re-fertilization, which questions the preoperative diagnosis of PTO. The explanation for these surprising results might be short-term functional affections or reversible disease of the proximal tubal segment. This could also be an explanation for increased pregnancy rates shortly after hysterosalpingography (HSG) or dye-pertubation. But HSG is the favoured diagnostic tool in PTO, although it reveals 30% false-negative results (WHO, 1986). Bipolar disease might be another reason for decreased fertility rates in cases with known proximal tubal disease (Grow et al., 1993; Scudamore et al., 1994).

First approaches for the conservative treatment of PTO are described as early as the middle of the 19th century (Snuth, 1848). Corfmann and Taylor (1966) and Thurmond and co-workers (1987) improved the technical performance to a standard by which transcervical procedures for tubal treatment of PTO could be reconsidered. New approaches (Confino et al., 1990) to dilate the proximal occluded tubes by balloon catheter demonstrated that the blind approach is possible, but depends on the tactile skill of the operating surgeon.

After the promising initial experiences with transcervical Falloposcopy with the aid of an everting catheter system (Bauer and Diedrich, 1992), which has similar balloon dilating effects, we used this new tool to visualise, localise and
overcome the proximal occlusion. During a one step procedure we were also able to evaluate the distal end of the tube and to detect coexisting bipolar diseases.

**Materials and methods**

The history of the 42 patients revealed in 18 patients previous pelvic inflammatory disease, in six patients previous abortions with curettage and in five patients previous ectopic pregnancies. From 1st June 1993 to 31st May 1997 we performed hysteroscopy, laparoscopy, chromopertubation and Falloscopic dilatation of proximal tubal occlusion.
was a mean 19 months (range 12–35 months). The follow-up time period was a mean 21 months (range 12–48 months) and was possible for 38 patients (22 out of 26 patients with positive recanalization). The patients lost for follow-up were considered in the non-pregnant group.

Before the transcervical dilatation of the tube a chromopertubation confirmed the diagnosis of PTO in 42 patients. The technique of transcervical tubal dilatation with the everting catheter is identical to the technique of transcervical Falloposcopy (Bauer et al., 1992). The observation of the Fallopian tube was performed via the Falloposcope after passing the whole Fallopian tube on the way back with the aid of the everting catheter. The assessment of the Fallopian tubes followed the Kerin score (Kerin et al., 1991).

Results

From the 1st June 1993 to 31st May 1997 (48 months) 157 Falloposcopies were performed in total. A total of 42 patients had PTO and 18 patients (42%) with bilateral PTO underwent recanalization, six bilateral (33.3%) and seven unilateral (38.8%). In five patients recanalization failed. Ten tubes were normal and two pregnancies were achieved. A total of 24 patients (58%) had unilateral PTO. We defined the contralateral Fallopian tube as occluded/missing, diseased or normal. The contralateral Fallopian tube was occluded (four patients with sactosalpinx) or missing in seven of these patients. Five tubes with PTO could be recanalized, four normal tubes were evaluated and two pregnancies occurred. The contralateral Fallopian tube was open but diseased in 13 patients of which seven tubes could be recanalized and four normal tubes were evaluated. The contralateral Fallopian tube was open and normal in four patients. One Fallopian tube with PTO could be recanalized and one normal tube was evaluated and one pregnancy occurred. Thus a total of 13 patients/Fallopian tubes with unilateral PTO had successful recanalization (54.1%), and an overall total of 26 patients (62%) with unilateral or bilateral PTO had successful recanalization. After dilatation four patients showed bipolar disease with sactosalpinx during the inspection of isthmus and amoule. In six other patients the patent Fallopian tube was diseased (23.8%). In 16 patients in which the tubes could not be dilated (38%) there was an occasional partial or complete perforation of the tubal wall following penetration of the endoscope and everting catheter into the abdominal cavity or the tubal interstitial space. In case of interstitial perforation a typical oedema of the tube wall could be visualised (Figure 4).

In total 60 tubes with unilateral or bilateral PTO were diagnosed, of which 32 (53.3%) tubes could be recanalized. A total of 20 recanalized tubes were normal and all five term pregnancies (12% of patients, 15.6% per recanalized tube) occurred in patients with healthy Fallopian tubes (Figure 5). The contralateral tube was diseased in four cases. The previous history of the five pregnant patients was in one case inconspicuous but in the other four an ectopic, SIN, abortion or PID was revealed. The patients lost for follow-up were treated as non-pregnant.
Pregnancies following IVF treatment were not included. No complications occurred either directly during the operation (perforations) or post-operatively. There were no late complications, haemorrhages or inflammations.

**Discussion**

The success rates of microsurgical operations on the proximal tube are lower than those of the anastomoses of the distal part (AMG, 1988). The lower pregnancy rates might be explained by co-existing bipolar tubal disease (Scudamore et al., 1994). Nevertheless data reported by Dubuisson in 1997 demonstrate an advantage after microsurgery in patients with PTO (Table I). The general disadvantages of microsurgery in laparotomy are the duration and the invasiveness of the procedure as well as the risk of pre-operative false-negative diagnosis (Sulak, 1987). The approach of a transcervical dilatation of the proximal tube excludes these disadvantages and is able to detect additional tubal pathologies, which can be identified in the therapeutic concept. False-negative diagnoses of PTO can be excluded immediately and therefore invasive treatment is avoided. The option for future microsurgical operation still remains after an attempt at transcervical dilatation.

In our study we could not achieve pregnancy rates as high as those achieved by Confino et al. (1990). The reasons remain unknown but could be explained by the patients included in our cohort. On the other hand it was possible to prevent 27 (64%) patients, who were treated successfully, from initial microsurgical intervention by laparotomy because 23.8% (10 patients recanalized from the group of 42 PTO patients) of patients had diseased tubes and second because 29% (5/17) of the treated patients with at least one normal tube conceived. These findings are comparable to the data of Confino et al. (1990) and the later results of Rimbach (Rimbach et al., 1998). The problems of transcervical tubal dilatation
are the mandatory tactile skill of the surgeon and the interpretation of the Falloposcopic pictures. Both demand training and experience and further solid data. The perforation by the Falloposcope or the everting balloon catheter in
Falloscopic dilatation of proximal tubal occlusion

Table I. Comparison of data in the therapy of PTO.

<table>
<thead>
<tr>
<th>Author</th>
<th>No. patients</th>
<th>Method</th>
<th>Recanalization rate %</th>
<th>Spontaneous conception pregnancy rate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gazzera et al. 1998</td>
<td>302</td>
<td>Selective catheterisation</td>
<td>94</td>
<td>10 (follow-up 12 months, including abortions)</td>
</tr>
<tr>
<td>Mallarini et al. 1992</td>
<td>246</td>
<td>Selective catheterisation</td>
<td>94</td>
<td>6.1 (follow-up 12 months, including abortions)</td>
</tr>
<tr>
<td>Dubuisson et al. 1997</td>
<td>120</td>
<td>Microsurgery</td>
<td></td>
<td>70 (follow-up 24 months, including abortions)</td>
</tr>
<tr>
<td>Wiedemann et al. 1996</td>
<td>109</td>
<td>Fallopscopy</td>
<td>92</td>
<td>1.8</td>
</tr>
<tr>
<td>Confino et al. 1990</td>
<td>64</td>
<td>Fallopscopy</td>
<td>53.3</td>
<td>26.5</td>
</tr>
<tr>
<td>Schill et al. (own results)</td>
<td>42</td>
<td>Fallopscopy</td>
<td>29*</td>
<td></td>
</tr>
</tbody>
</table>

*Percentage of patients with normal tubes.

case of unsuccessful dilatation of the proximal block were without sequelae for the patients. This is also confirmed by other authors (AMG, 1988; Confino et al., 1990; Kerin et al., 1991; Scudamore et al., 1994). During the complete or interstitial perforation minimal intratubal bleedings are visible but prognostically unclear. Currently the question of the postoperative recocclusion is not clarified. The data of Confino et al. demonstrate a recocclusion of 32%. In case of guide wire recanalization recocclusions appear in 60% of cases (Mallarini et al., 1992; Gazzera et al., 1998). In comparison to cumulative pregnancy rates after IVF (54.9%, Roest et al., 1998) the pregnancy rates after dilatation via Falloposcope are lower. A spontaneous birth rate of 29% achieved among the patients treated during a diagnostic and then therapeutic procedure without any additional treatment seems to suggest this as the first choice treatment. If no pregnancy occurs following a year after the dilatation, IVF or microsurgery can be advised.

Advantages of transcervical dilatation are the minimal-invasive operation with reduced trauma and fast convalescence (AMG, 1988). In our experience it is reasonable to combine this procedure with a laparoscopy in case of PTO. The passage of the Falloscope can be guided and controlled and the peritubal condition of the tube can be judged and in case of additional pathologies these might be treated. The combination of intraluminal and laparoscopic picture allows a better localisation of the proximal tubal occlusion. During laparoscopy it is possible to stretch the Fallopian tube and support the catheter in passing the poststenotic bending of the tube. This to reduce the risk of perforation during the dilatation.

Fallopscopy can clearly visualise the PTO and the surrounding intraluminal tissue. Our data clearly demonstrate that PTO diagnosed by HSG or laparoscopy with dye-chromopertubation should be confirmed by Falloposcopy or selective tubal catheterisation prior to a planned microsurgical intervention. Fallopscopy can additionally identify bipolar disease thus avoiding blind tubal catheterization. (Scudamore et al., 1994). Our data underline the low perioperative risk and the good therapeutic results of transcervical proximal tubal dilatation, especially transcervical Falloposcopic guided dilatation. However, detailed controlled and
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prospective trials are needed to evaluate the overall usefulness of the method against alternative approaches.

References


