Fallopian tube/falloposcopy/tubal infertility

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Fallopion tube in conjunction with laparoscopy: possibilities and limitations

Introduction

It is well established that damage to the internal mucosa of the human Fallopian tube can result in disturbance of the normal fertilization and ovum transport process, and it has been estimated that up to 40% of female patients have tubal disease as the main cause of infertility (Speroff et al., 1993). Traditional assessment of the Fallopian tube is inadequate, as it gives no information about the capacity of the tube for gamete and zygote transport (Ahlgren et al., 1975). Previous visual examinations were restricted to inspection of the outer surface of the tubes by laparoscopy and the distal endosalpinx with salpingoscopy (Brosens et al., 1987). Patency is usually assessed by hysterosalpingography (HSG), chromopertubation, or more recently by ultrasonographic techniques (Maguiness et al., 1992). Three additional methods have also been proposed as possible diagnostic tests for tubal function; Chlamydia trachomatis antibody (CAT) and chlamydial heat shock protein antibody (CHSP-60) used in combination have been recommended as integral components of the initial fertility work-up for assessment of Chlamydia-associated tubal factor infertility (Dabekausen et al., 1994; Claman et al., 1997). Radionuclide hysterosalpingography (RN-HSG) has also been proposed to determine active tubal transport. However, the value of RN-HSG has recently been questioned, since the technique does not distinguish between fertile women and infertile women (Lundberg et al., 1997).

Fallopion tube has been suggested to be a more valuable clinical tool to provide prognostic data in the investigation of female infertility (Kerin et al., 1992; Marana et al., 1996). However, the clinical value of falloposcopy remains to be critically determined. A randomized prospective international multicentre study on falloposcopy was started in 1994 to evaluate the clinical value of falloposcopy, but so far, only preliminary data have been reported (Rimbach et al., 1995).

The aim of the present study was to evaluate the performance of falloposcopy in conjunction with diagnostic laparoscopy in routine investigation of female infertility.

Materials and methods

Women who gave their informed consent had a falloposcopy performed in conjunction with diagnostic laparoscopy as part of an investigation for infertility. All women were unselected community cases at Danderyd Hospital, Stockholm or Akademiska Hospital, Uppsala, Sweden during 1995 and 1996.

Study group

Forty-three women, 22–40 years of age (mean 31.3 years), with a history of infertility ranging from 1 to 6 years (mean 2.8 years) volunteered for falloposcopy in conjunction with laparoscopy. Twenty-three had primary and 20 secondary infertility. All women except one had spontaneous ovulation. Six partners had semen parameters below the normal range. Twelve women were assumed to have tubal factor infertility: five women had a history of previous pelvic inflammatory disease (PID) and seven had a history of abdominal surgery. In 24 women, the infertility diagnoses were unexplained. Twenty-six women had an HSG and eight laparoscopies because of involuntary infertility prior to the falloposcopy.

Timing of falloposcopy

The day of examination was based on menstrual data. The examination was performed within a few days after the end of the menstrual period, i.e. within cycle day 5–9 for most women.
For unilateral tubal investigation was limited operation time. The ‘normal’ time for operation was estimated to be 60 min. Technical problems occurred in eight tubes. The most frequent technical problem was ‘kinking’ of the catheter that occurred in seven women. In one woman, the tip of the falloposcope was damaged and no image was obtained. Hysteroscopic problems meant that the tubal ostia could not be identified due to thick endometrium.

Proximal tubal occlusion (PTO) was demonstrated in nine women. In another five women with blockage, we succeeded in obtaining images from sections of the ampullary part of the oviduct.

No investigation was of sufficient quality to describe the entire tubal mucosa in detail mostly due to partial ‘white out’. Images with good quality from both tubes were obtained in only 10 women (23.3%).

One complication occurred during falloposcopy in terms of oedema in the tubal mucosa related to partial perforation of the oviduct by the falloposcope during irrigation of the tubal mucosa. No intervention was needed.

### Discussion

Falloposcopy is the first method that provides the possibility to inspect the entire inside of the oviducts, i.e. the endosalpinx. From a scientific viewpoint, the technique is a great achievement for in-vivo exploration of an organ which plays a central role in human reproduction.

Several authors have put forward the advantages of falloposcopy, and it has been reported that falloposcopy can be performed on an outpatient basis without anaesthesia (Bauer et al., 1992; Scudamore et al., 1992; Dunphy and Pattinson, 1994). It has also been recommended that falloposcopy should be routinely combined with laparoscopy because laparoscopy provides additional important information in 4–8% of cases (Rimbach et al., 1995). We found that laparoscopy also aided the falloposcopy procedure as the lateral part of the tube could be straightened out with assistance from the laparoscopist.

It has been stated that falloposcopy is a safe procedure with few complications. Kerin (1994) reported that tubal wall perforation, partial or total, occurred in 3–10% and was never to be followed by an intervention. We agree with this, as we had only one partial perforation without need for intervention.

Kerin et al. (1992) devised a diagnostic classification and scoring system for tubal lumen disease based on falloposcopy. We were not able to use this scoring system because of the poor quality of our pictures.

Both our teams felt that ~10 investigations were required to become comfortable with all the different steps involved in a successful falloposcopy. PTO of the Fallopian tube is the cause of infertility in ~10–25% of women with tubal disease (Mårtensson et al., 1993). Falloposcopy may have a role in the diagnosis and treatment of PTO, as it is the only method that can distinguish between structural PTO and tubal spasm. Tubal recanalization by transcervical tubal catheterization has been shown to be an effective treatment for infertility due to PTO (Risquez and Confino, 1993). In our experience, technical problems with poor or unobtainable images preclude recogni-

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### Table 1. Reasons for failure to explore 40 tubes

<table>
<thead>
<tr>
<th>Reasons for failure to investigate</th>
<th>n</th>
<th>%</th>
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<tbody>
<tr>
<td>Limited operation time due to ethical and medical reasons</td>
<td>19</td>
<td>47.5</td>
</tr>
<tr>
<td>Technical problems</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Hysteroscopic problems</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Proximal tubal occlusion</td>
<td>9</td>
<td>22.5</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100</td>
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tion of spasm or blockage as well as successful recanalization with the falloscope. Most of our attempts to treat PTO failed, as the coaxial system was too soft to penetrate the blockage. Obviously, the design of the system has to be improved if it is to meet this purpose.

We conclude that falloposcopy represents a unique tool for visualization of endotubal disease and may provide a valuable instrument for in-vivo exploration of tubal physiology. The technique may have therapeutic applications through its capacity to remove intraluminal debris and adhesions under direct visual control. However, certain technical problems limit the usefulness of this method in routine clinical practice. These technical problems must be solved before falloscopy will achieve a central position for investigation and treatment of tubal disease.

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References
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