

EVALUATION OF HYDROTUBATION AS A TUBAL PATENCY TEST

by

SOMLATA KAUL,* M.D. D.G.O.

and

A. N. GUPTA,** M.D. D.G.O.

The fallopian tubes are unique and important structures in the female genital tract and they form the most important single area of infertility. The tubal factor is responsible for infertility in 21% (Stallworthy, 1963) to 47% cases (Rubin, 1947).

A variety of diagnostic procedures have been devised to evaluate the patency of the tubes, but they all have their limitations. Of these the most commonly used test of tubal patency is the Rubin's test which is a fairly simple and well established procedure, yet the common difficulties one faces with it are: (i) A high incidence of false negative results. (ii) CO₂ is not readily available in small cylinders. (iii) The Sharman's kymograph is a sophisticated expensive instrument and requires some technical know-how.

Hence there has been a need for a simpler tubal patency test. This study was undertaken to evaluate whether hydrotubation with cortisone and antibiotic solution can be used as an initial tubal patency test with some advantages over the Rubin's test.

Review of Literature

The term "hydrotubation" was suggested by Yagi (1955) for uterotubal in-

*Sr. Resident.

**Professor, Department of Obst. & Gynec., Postgraduate Institute of Medical Education & Research, Chandigarh.

Accepted for publication on 2-12-1974.

jection of isotonic saline. Previously hydrotubation was used widely as a therapeutic procedure in the management of tubal occlusion.

Reubenstein (1954) reported on the diagnostic and therapeutic uses of hydrotubation and he used nitroglycerine to overcome the tubal spasm. Diagnosis of tubal patency depends on the subjective feeling of lack of resistance to passage of fluid through uterotubal junction into the peritoneal cavity. Najima (1966) found an accuracy of 88% with this method of diagnosing tubal patency. Horne and Kosaka (1972) had almost similar results.

Material and Methods

Thirty-four patients attending the sterility clinic of the Nehru Hospital, Chandigarh, were studied. Hydrotubation was used as a tubal patency test in the follicular phase of the menstrual cycle.

As controls, 34 patients who had tubal patency assessed previously by Rubin's test were selected.

The equipment required is the same as that used in hysterosalpingography.

Method for Hydrotubation

A 10 cc syringe was filled with the hydrocortisone antibiotic solution and instillation started through the Rubins insufflation cannula after ensuring a leak-proof fit at the external os. Tubal patency was suggested if 8-10 cc of the fluid could be pushed in without force. Stenosis or

spasm was suggested if the same amount could be pushed in after applying force on the piston of the syringe. Tubal block was suggested if there was a reflux or leak of the fluid after injection of first 3-5 cc.

Each patient except the exceptions noted in the four Tables had a check hysterosalpingogram in the succeeding cycle with the oily radio-opaque medium lipiodol and both immediate and 24 hours delayed films were obtained.

Results

TABLE I
Evaluation of Positive Hydrotubations by Hysterosalpingography

Test	Positive	Negative
Hydrotubation	25	0
Hysterosalpingography	18*	1

* 6 hysterosalpingograms were not done as five conceived in the same cycle after hydrotubation and one had T.B. endometritis.

TABLE II
Evaluation of Positive Rubin's Tests by Hysterosalpingography

Test	Positive	Negative
Rubins	25	0
Hysterosalpingograms	22*	1

* 2 hysterosalpingograms were not done as patients conceived.

Table I shows tubal patency was proved in 25 patients by hydrotubation. Of these 18 patients showed tubal patency on hysterosalpingography. In 6 patients hysterosalpingography was not carried out as 5 of them conceived, thereby proving tubal patency. One patient who had apparently patent tubes on hydrotubation could not be evaluated by hysterosalpingography as she developed a flare up of a latent T.B. endometritis after hydrotubation. The histopathology report of

the endometrial biopsy came in after the hydrotubation was done. However there is nothing to suggest that the tubes were obstructed in this patient as the tubes may be patent yet rigid and pipelike in a case of T.B. genital tract.

Table II: This group of 25 patients was compared with a series of 25 controls who had had tubal patency proved by Rubin's test. Twenty-two of these had positive hysterosalpingogram and one showed a tubal block on hysterosalpingography, thus showing a false positive Rubin's test. Two patients did not have hysterosalpingography as these patients conceived before that procedure could be carried out.

From Tables III and IV it is clear that there were two false negative cases out of 9 in the Rubin's group and none in the hydrotubation group.

TABLE III
Evaluation of Negative Hydrotubation by Hysterosalpingogram

Test	Negative	Positive
Hydrotubation	9	0
Hysterosalpingography	9	0

TABLE IV
Evaluation of Negative Rubin's Test by Hysterosalpingography

Test	Negative	Positive
Rubins	9	0
Hysterosalpingography	7	2

Discussion

It is apparent that there were no false negative results when hydrotubation was used as an initial tubal patency test as against 2 out of 9 (i.e. 22%) false negatives with a Rubin's test. This lends support to the findings of Grant and Mackey (1955) and Topkins (1957) who

reported a high incidence of false negative results with tubal insufflation. Unilateral or bilateral tubal patency after a negative Rubin's test may be shown in 15-46% cases (Feldman, 1967). These false negatives may be due to the fact that tubal spasm is known to be greater with Rubin's test than with hydrotubation or hysterosalpingography (Horne and Kosaka, 1972).

The incidence of false positive results with hydrotubation could not be definitely established but at the most it was not more than one in 25 cases i.e. 4%. There is no way of proving whether the tubes were patent or not in the patient of TB endometritis as a hysterosalpingogram could not be done.

Flare up of quiescent pelvic TB is a well known complication of tubal patency tests showing thereby that there is a point in doing endometrial biopsy before tubal patency test, especially in this country where the incidence of genital TB in cases of primary sterility is high.

On the other hand, 4% incidence of false positive Rubin's test was definitely noted in this series. This supports Sweeney's (1962) findings of a high incidence of false positive Rubin's test. He stated that the characteristic kymographic tracing, auscultation of the abdomen and pain in the shoulder and lower abdomen are not always associated with tubal patency.

The conception rate after hydrotubation was 20% in contrast to 8% after Rubin's test which is a significant difference. The value of hydrotubation as a therapeutic procedure in tubal occlusion is well known. Also the therapeutic effects of diagnostic hysterosalpingography are said to give conception rates of 25-40% within 6 months (Wahby, 1966) and the reasons given for this

have been the same as those of the therapeutic effects of CO₂ insufflation—namely separation of mild agglutination of the tubal folds straightening of tortuous tubes and dislodging of inspissated mucus from narrower to wider portions of the tube.

In addition, the beneficial effects of hydrotubation may be due to the dilatation of the tube with fluid media and stimulation of tubal peristalsis by the bolus of fluid. Besides the effect of local cortisone on granulomatous and non-granulomatous lesions of the tube are well known. Hence it is not surprising to find a conception rate of 20% in this group.

Lastly the factor of shoulder pain following Rubin's test is eliminated when hydrotubation is used as a tubal patency test.

Conclusions

1. Hydrotubation can be used as an initial tubal patency test. It is a simple procedure, can be performed readily in the out patient department, does not require any elaborate apparatus and seems to be more accurate than the Rubin's test.

- (a) There were no false negatives with hydrotubation, as against 22% false negative Rubin's test.
- (b) This method can be used with advantage where a previous Rubin's test has shown negative or equivocal results.
- (c) When used as a diagnostic test it may have an additional therapeutic value over Rubin's test, as shown by a conception rate of 20% as against 8% during this period of study.

More studies have to be undertaken to support the above findings. Hysterosalpingography in cases of tubal blockage to

demonstrate the site of obstruction is still needed.

References

1. Feldman, H. J.: International J. of Fertil., 5: 289, 1960.
2. Frangenheim, H. S.: Geburtsh Gynaek., 168: 184, 1968.
3. Grant, A. and Mackay, R.: New Zeal. Med. Jour., 54: 307, 1955.
4. Horne, H. W. and Kosaka, T.: Obst. & Gynec., 39: 3, 368, 1972.
5. Najima, S. I. T., Arita, T. and Sato, N.:

- Jap. Jour. Fertil. & Steril., 113: 230, 1966.
6. Rubenstien: Rev. Espan. Obst. & Gynec., 7: 9, 1954.
7. Rubin, I. L.: Collected papers, 1910-1954, p. 304.
8. Stallworthy, T.: Fertil. & Steril., 14: 248, 1963.
9. Sweeney, W. J.: Fertil. & Steril., 13: 113, 1962.
10. Topkins, P. T.: Obst. & Gynec. Survey, 12: 621, 1957.
11. Wahby, O., Subrero, A. J. and Epstein, J. A.: Fertil. & Steril., 17: 520, 1966.
12. Yagi, H.: Fertil. & Steril., 5: 550, 1955.