

# Transvaginal hydrolaparoscopy in the diagnosis of tubal pathology

Citation for published version (APA):

Tros, R. (2022). *Transvaginal hydrolaparoscopy in the diagnosis of tubal pathology*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20221209rt>

## Document status and date:

Published: 01/01/2022

## DOI:

[10.26481/dis.20221209rt](https://doi.org/10.26481/dis.20221209rt)

## Document Version:

Publisher's PDF, also known as Version of record

## Please check the document version of this publication:

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## Impact paragraph

The Fallopian tubes are necessary for the transport of spermatozoa, ovum and embryo. Their fimbriae have to move freely to pick up the ovum, store it in the folds of the tube and wait for spermatozoa to fertilize it after which the cilia sweep the zygote to the uterus. When tubes are blocked or dysfunctional, this process can be disturbed. Tubal infertility, which is the result of damage or infection to the Fallopian tubes, accounts for around 20% of all subfertility diagnoses. Tubal testing is therefore offered during subfertility workup.

Transvaginal hydrolaparoscopy (THL) is one of the available visual tubal patency tests. THL uses the transvaginal route to enter the pelvis after warm saline is infused. With a 30 degrees optical endoscope connected to a video camera system and monitor, the whole pelvis is inspected for adhesions, endometriosis or other pathology. Furthermore, tubal patency is tested by flushing a blue dye through the tubes. THL allows both the gynaecologist to visualize potential fertility declining abnormalities directly and the woman in question to witness the whole procedure at the same time. In terms of direct visibility, THL is comparable to diagnostic laparoscopy (DLS), the reference standard for testing tubal patency. However, a big advantage of THL compared to DLS is THL can be performed under local anaesthesia where as DLS requires general anaesthesia and thus hospitalization. The fact that THL can visualize the pelvis and internal female organs a direct manner, next to testing tubal patency, is why some gynaecologists prefer THL over other visual tubal patency tests. Though, THL is only practiced by a small number of gynaecologists in four hospitals/clinics in the Netherlands. In most Dutch hospitals as well in the Dutch guideline for fertility workup hysterosalpingography (HSG) is the preferred tubal patency test. HSG is a visual tubal patency test like THL, but can only visualize tubal pathology and no other pelvic pathology. To the contrary of THL, it does so in an indirect way. HSG uses serial X-rays or fluoroscopy to evaluate the shape of the uterine cavity and the patency of the Fallopian tube by injecting a radiopaque medium through the cervical canal into the uterus and subsequently the tubes. When an oil-soluble contrast medium is used, HSG has a therapeutic effect as well, with a higher chance of clinical pregnancy and birth compared to the use of a water-based contrast medium. But when HSG shows abnormalities, these have to be confirmed with DLS. This is a major drawback compared to THL.

The question at hand is if THL is a procedure which gynaecologists should embrace or should forget. In other words, is THL comparable to or even better than HSG and DLS in diagnosing fertility declining pathology with the same safety and tolerability for women undergoing this procedure?

In this thesis we showed THL to be an accurate, safe and tolerable procedure in diagnosing tubal and pelvic pathology, comparable to both HSG and DLS. When compared to HSG, THL has:

- the ability to omit diagnostic laparoscopy
- an acceptable but higher complication rate (2.6% for THL versus 0.7% for HSG) without major complications
- lower pain scores
- comparable acceptability
- a higher failure rate (5.6% for THL versus 0.7% for HSG)
- the ability to select women suitable for therapeutic laparoscopy

When compared to DLS, THL has:

- no need for general anaesthesia and hospitalization
- a high sensitivity (how many women are correctly identified as having tubal pathology, endometriosis and/or adhesions) but low(er) specificity (how many women are correctly identified as having no tubal pathology, endometriosis and/or adhesions)

This means that the current gynaecologist performing THL, can continue to offer this to women as tubal patency test for completing their fertility workup. If other gynaecologists want to start performing THL, they should take two points of concern from this thesis into account. First, the learning curve takes up to 50 procedures before the complication rate drops. To minimize the number of complications a small permanent executive team can help to maximize the exposure and experience. Second, to decline failure rate, we discussed better patient selection. This can be done by training of all staff counselling women for tubal testing and making them aware of the contraindications of THL. This can help unnecessary cancellations prior to THL or complications of THL which will protect the women concerned. Especially those with a (fixed) retroverted uterus should not be counselled for THL as this thesis showed an almost fivefold higher chance on complications.

Nowadays it depends where a subfertile woman has her fertility work-up, what kind of tubal test she is offered to undergo. When the HSG shows abnormalities, DLS is the next step. But when all Dutch gynaecologist would perform THL instead of HSG, an unnecessary diagnostic laparoscopy could be omitted and only in case of pelvic or tubal abnormality a therapeutic laparoscopy can be scheduled when necessary. Furthermore, THL can be beneficial for the understanding and counselling of the woman and her partner because they can watch the THL procedure directly on the video screen. In this way, the gynaecologist can show and explain possible abnormalities directly which is more patient friendly.

With this thesis we have provided evidence why THL should be acknowledged and have a more prominent place in the work-up of subfertile women. Ongoing research from our THL-group will show if THL, just like HSG, also has a therapeutic effect when an oil-soluble contrast medium is used.

A next step is conducting the “Visual tubal patency tests for tubal occlusion and hydrosalpinx” Cochrane review in which we will try to find the visual tubal patency test which can replace diagnostic laparoscopy. As this study is published on the Cochrane website and will be freely available for physicians and patients worldwide, both our target groups (fertility doctors / gynaecologists and subfertile women) can be reached.