

## Virtual Hysterosalpingography: Its Place in the Workup of Infertile Women

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### About the Author



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### Introduction

Women with infertility are faced with the possibility of undergoing several tests. Among these are those which rule out uterine and tubal factors contributing to infertility. The gold standard for years has been hysteroscopy and laparoscopic chromotubation [1, 2]. These two endoscopic modalities have been the mainstay in confirming pathology of a woman's genital organs. Benefits include actual visualization of organs and the ability to proceed with a surgery if need to be. However, need for anesthesia and operating room costs and risks make hysterolaparoscopy out of reach for some in

developing countries. In comparison, hysterosalpingography (HSG) has variable sensitivity and predictive values [3–5]. Drawbacks include its exposure to radiation and patient discomfort. In the past years, reports have been put to print on the role of virtual HSG [6–8]. Carrascosa et al. have fervently promoted virtual HSG as one that provides 'comprehensive and highly accurate evaluation of both the female reproductive system and pelvic anatomy.' However, radiation dose was a concern highlighted by them in their article. The procedure of a virtual HSG is given below and is followed by a discussion on whether this test is advisable in the workup of a woman with infertility.

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### Case Report

This virtual HSG was carried out under the author's supervision in the Department of Radiology at our institute. Patient demographics and virtual HSG technique were noted and reported below.

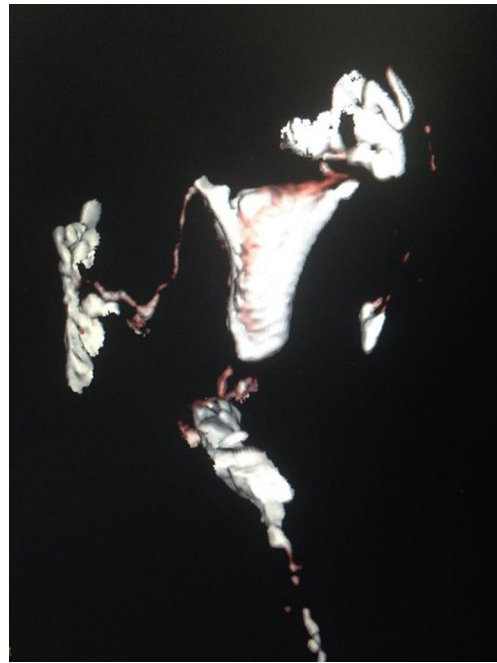
A 26-year-old housewife, married since 3 years, nullipara who was anxious to conceive was referred for an HSG. Past medical and surgical histories were not significant. Her general and per abdominal examination were within normal limits. She denied history of allergy and was not on any medication. Informed consent was taken, and the patient was explained the nature of the procedure.

The virtual HSG was performed by the senior resident (G.S.D) in the preovulatory phase (Day 7–10 of her menstrual cycle). All pertinent medical records were reviewed meticulously to provide data for this report. Premedication with analgesic and anti-spasmodic drugs, i.e., Inj. Atropine and Inj. Hyoscine, was done. She was positioned on the CT scanner (128 slice SS, Optima 660, General Electric Healthcare) table in lithotomy position and scout image taken. Her perineum was cleansed with povidone-iodine solution and draped with sterile towels. Following strict aseptic precautions, the gynecology resident introduced a Leech Wilkinson cannula after stabilizing the cervix with a vulsellum. Contrast administration through the cannula took place in two stages. During the initial stage, 2 ml of non-ionic water-soluble radiopaque dye (Ultrascan, 370 mg/ml diatrizoate meglumine and diatrizoate sodium) was administered into the uterine cavity. Thereafter, 20 ml of contrast material was instilled to demonstrate tubal patency. Scans were taken on the MDCT scanner, and images were saved on the workstation (Konica Minolta). Instruments were removed and patient was given a short course of antibiotics. Images were subsequently reconstructed on the scanner console and were available for viewing (Fig. 1). Review of the virtual HSG-reconstructed images showed that this patient had a normal uterus and bilateral patent fallopian tubes.

## Discussion

A woman with primary or secondary infertility is faced with the unimaginable task of subjecting herself to a plethora of investigations. It is prudent as practicing physicians to limit the list of investigations to the bare minimum. An ideal test would be one which would give clinicians as much information about the woman's reproductive milieu with least discomfort. Today, endoscopy has found its niche in the workup of such women. It would be hard to find a place for imaging and even more so if one suggested they should be the mainstay in diagnosing uterine or tubal pathology.

Sonosalpingography and sonohysterography have gained popularity primarily because of their lack of radiation exposure to the woman [9]. One must remember that unlike other patient populations, women with infertility are anxious about the cumulative radiation dose that they are



**Fig. 1** Virtual HSG-reconstructed image of a 26-year-old woman with primary infertility shows a normal uterus and fallopian tubal architecture

subjected to in their evaluation because of the potential harm it may cause if they would conceive in the future [10].

Authors have listed a radiation dose level of 2.6 mSv for a virtual HSG which is permissible as per ACR guidelines [6–8]. However, in our patients, the dose is much higher than this value and we would not recommend it based on this fact alone.

A statutory warning must accompany any MDCT imaging technology used to evaluate women with infertility because X-rays have been listed as a carcinogen, and it is well known that CT scanners have many a time flouted norms on maximal permissible radiation dose levels [11, 12]. Other drawbacks of virtual HSG include the need for a trained CT technician, the availability of expensive CT scanner which are out of reach for many women in rural centers, complex reconstruction software, and the need for non-metallic cannulas and specula to prevent artifacts on CT scans. The cost of virtual HSG is approximately three times that of a standard HSG which is significant in developing countries such as ours.

## Conclusion

The author describes a case of infertility that underwent virtual HSG at a teaching Institute and puts forward a viewpoint on what implications it has on the workup of a woman with infertility. Virtual hysterosalpingography is

not a ‘must-do’ technology to assess women with infertility. It subjects the patient to radiation and needs specialized reconstruction software to produce images. This imaging modality is of pure academic interest and should not replace endoscopic techniques in managing these individuals.

**Compliance with Ethical Requirements and Conflict of Interest** All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000 (5). Informed consent was obtained from all patients for being included in the study. The author has no conflict of interest.

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