Diagnostic Utility of Pre and Post HSG Transvaginal Sonography: The Birth of a New Beginning

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ABSTRACT

Background: *The use of ultrasonography in the investigation of infertility has progressed rapidly and has currently become an integral part of the management of infertility in women. The advent of pre and post hysterosalpingogram (HSG) sonography has anecdotally improved the sensitivity and specificity of HSG in the assessment of tubal anomalies.*

Aim: *To report a case of a peritoneal spillage of contrast during HSG which did not reveal fluid in the pouch of Douglas on abdominal and tranvaginal sonography.*

Methods: *A case of pre and post HSG transvaginal sonography is reported with review of relevant literature.*

Results: *HSG showed bilateral spillage of dye without any significant increase in pouch of Douglas fluid on pre and post HSG ultrasongraphy*

Conclusion: *Pre and post HSG sonography have improved the HSG diagnostic accuracy of tubal normalcy as against patency. The quantity of fluid in the pouch of Douglas in the post HSG sonogram (culdosonogram) gives an indication of a free or localized peritoneal spillage.*

Key Words: *hysterosalpingogram, 'culdosonography', Gynaecology.*

INTRODUCTION

There have been many advances in the medical and surgical management of infertility in the past several years[1].Radiological investigative techniques have become very important in the management of obstetric and gynaecological patients. One of the major aetiologies of infertility in women is blockage of either end of the fallopian tubes. In Sub-Saharan Africa, the commonest cause of infertility in women is bilateral tubal occlusion owing to the preponderance of sexually transmitted disease or complications of pregnancy[2]. The determination of tubal patency is very essential because any treatment, such as induction of ovulation and artificial insemination, given without confirming that the tubes are patent, may prove futile[3].

Ever since Rubin described the tubal in sufflations test in 1920 by using CO_2, several methods to assess tubal patency have been described by different authors[4]. These include HSG, Hysterosalpingoscintigraphy, hysteroscopy, laparoscopy and dye test[5]. Currently, hysterosalpingography, laparoscopy and dye test are the most commonly used methods[3].

With the advent of diagnostic and operative laparoscopy, the role and relevance of hysterosalpingography (HSG) as a routine investigation in infertility is gradually being debated[6]. A recently published article based on a multicentre randomized controlled trial failed to show any statistically significant difference in the cumulative pregnancy rates with the routine use of HSG in the work up of infertility[7]. There are technical lapses in the interpretation of HSG making it less accurate and predictive when compared to laparoscopy, hysteroscopy and salpingoscopy. Besides, emphasis is predominantly not laid on the description of peritoneal spillage which might either be free or localized (loculated). Literature search has not revealed any quantitative or objective measure for assessing localized or loculated spillages which is indicative of peritubal adhesive disease. Those technical flaws would affect infertility management and especially in developing countries where laparoscopy services are costly alongside poorly functional health insurance schemes. In sonohysterography procedures, tubal patency is confirmed when fluid is seen entering the pouch of Douglas. We present a case of a patient whose HSG radiographs showed bilateral tubal spillage of contrast with pre and post HSG sonograms not showing a significant change in the pouch of Douglas fluid which suggests the presence of peritubal adhesive disease.

CASE REPORT

A 27 year old nulliparous woman was seen in the gynaecological clinic and was found to have vaginal discharge, lower abdominal pain and inability to conceive after 5 years of marriage. Clinical diagnoses of chronic pelvic inflammatory disease and primary infertility were made. She was treated with antibiotics with the results of microscopy, culture and sensitivity of high vaginal and endocervical swabs. Following proper treatment, she was booked for HSG on day 8 of the menstrual cycle. On the day of the investigation, abdominal and transvaginalsonographies were conducted prior to the HSG in line with the departmental routine for HSG. This gave an indication of the uterine size, version and estimate of the quantity of fluid in the pouch of Douglas (if any).

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Immediately after the HSG, transvaginalsonograph (TVS) was conducted to assess the quantity of fluid in the pouch of Douglas ('culdosonography').

The HSG radiograph (Fig I) showed bilateral spillage but the sonograph (Fig II) did not show any change in the pouch of Douglas fluid. No movement or mobile echoes indicating gases in the contrastor clotted blood from the endometrial abrasion by the uterine sound or cannular were seen.

Fig. I: Hyserosalpingogram showing bilateral spillage of contrast.

Fig II: Pre and Post HSG Sonograph showing similar fluid pockets in the pouch of Douglas (Culdosonograph)

DISCUSSION

The main purpose of this report is to show that a pre and post HSG sonography can result in a substantial decrease in the number of indeterminate peritoneal spillage; which would improve the diagnostic efficacy of (HSG) in the absence of facilities for endoscopy. Tuboperitoneal factors are responsible for about 30-40%of female infertility[4].Peritubal adhesions are significant causes of infertility in women, altering the normal anatomic relationship between ovarian fimbriae and ovary and interfering or preventing the normal capture and transport of the ovum[8].

In peritubal adhesion diagnosis, hysterosalpingography is considered less accurate than laparoscopy, which shows adirect view of the pelvic abnormality. High rates of false-positive and false-negative results are found on hysterosalpingography compared with laparoscopy[9]. However, the direct relationship between the severity of pelvic adhesions and reproductive outcome after surgery has been discussed[10,11].

Laparoscopy is considered the best technique because of its direct view of pelvic abnormality and the possibility of a one-session treatment (adhesiolysis)[4]. The disadvantages are the invasive nature of the procedure, associated morbidity and mortality and the fact that it is expensive[4]. Hysterosalpingographyis usually included in the female infertility work up and often performed before surgery for a preliminary evaluation of the female genital tract (uterus, fallopian tube lumen, and peritoneum). Pre-procedural antibiotics should always be advised[12].

In a study done in India among 50 gynaecologists and 50 radiologists to determine the role and relevance of HSG in the current day work up for infertility, as high as 40% of the respondents failed to realize that a slow gradual mode of contrast injection was the best technique to adopt, as this delineates the endometrial cavity in the non-distended state[6]. This provides a unique opportunity to diagnose small subtle intra-endometrial space-occupying lesions or synechiae, which tend to get obscured in the late-distended phase.

The patient should always be asked to empty her bladder before the procedure, to avoid discomfort during cannulation. The role of gentle psychological reassurance cannot be neglected[13].

During HSG, the pre HSG sonograph will determine the size, version of the uterus and estimate the quantity of fluid in the pouch of Douglas (if any). The knowledge of the size of the uterus gives an estimation of the quantity of contrasts to be given as larger quantities are injected in cases of Leiomyoma uteri. The version of the uterus gives an idea of the best ways to pass the dilators, uterine soundsand canullar to avoid unnecessary sounding of the uterus which might injure the endometrium and cause intravasation of the contrast agent.

Though, the term "tubal patency" is over-emphasized in HSG literature, the ideal terminology should be "tubal normalcy". It should be ascertained that contrast spill is truly a "free" intraperitoneal spillage and not a "localized" spill. Peritubal venous intravasation is an important sign on HSG that may favour the likelihood of tubal disease. It would be worthwhile to reiterate here that, "free" intraperitoneal spillage is not the only parameter to establish tubal normalcy on HSG. Mucosal evaluation and the likelihood of peritubal adhesions are integral components of tubal assessment[14].Tracking fluid in the Pouch of Douglas is a way assessing tubal patency during HSG or saline contrast sonography also known as saline contrast sonohysterography(SCSH). The pre-HSG sonogram gives an estimation of the initial (pre-contrast) fluid in the pouch of Douglas, while the post HSG sonogram gives an indication of free peritoneal spillage if there is significant increase in the quantity of the fluid.

Radiation-related issues are certainly valid but these should not be over-emphasized and they do not constitute an ethical evidence to eliminate HSG from routine infertility work-up. The ideal practice would be to adopt an accurate technical protocol, which restricts the radiation dose to "as low as reasonably achievable" (ALARA)[6].

In view of this technical advance, the following recommended alternative titles are made for further studied in a larger population: How free is the free peritoneal spillage in HSG? Does a peritoneal spill indicate a normal HSG?, How normal is the normal HSG report that you received? , Does tubal patency mean tubal normalcy? All these give an indication that the HSG might be inconclusive without a pre and post HSG "culdosonography" for the assessment of cul-de-sac. It is important for the clinician or clinical scientist who carried out the HSG to report the radiographs with a comment on the injection pressure as plunger reflux would give an indication of the presence of partial or complete tubal occlusion. More rigorous studies in these areas to further validate or confirm these findings in a larger population have been suggested.

In conclusion, this technical advance has shown the additional diagnostic utility of HSG when combined with a pre and post contrast sonogram. It is hereby recommended that pre and post HSG transvaginal sonogram should be adopted routinely for patients undergoing HSG in the work up for infertility.

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