



### Research article

## A case study on diagnostic value of Hysterosalpingography in Infertility associated with recurrent pregnancy loss

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### ABSTRACT:

Infertility combined with recurrent pregnancy loss (RPL) presents a unique diagnostic and therapeutic challenge. Hysterosalpingography (HSG), a radiographic technique used to evaluate the uterine cavity and fallopian tube patency, plays a pivotal role in identifying structural abnormalities contributing to infertility and pregnancy loss. **Aims & Objective:** This case study aims to assess the diagnostic value of HSG in a female patient presenting with secondary infertility and a history of recurrent pregnancy loss. **Methods:** We present the case of a 37-year-old woman with Nine previous spontaneous pregnancies resulting in first trimester miscarriage, followed by 8 years of infertility. A comprehensive diagnostic workup was conducted, including hormonal profile, pelvic ultrasound, and Hysterosalpingography. **Results:** HSG revealed Uterine anomaly (T Shaped Uterine Cavity) which was probably a major contributing factor for recurrent first trimester pregnancy loss. **Conclusion:** HSG remains a valuable diagnostic tool in evaluating secondary infertility and RPL, especially in detecting intrauterine abnormalities such as anomalies. Its role in early and accurate identification of uterine pathology significantly improves reproductive outcomes and can avoid the situation of RPL.

**KEY WORDS:** Hysterosalpingography, Recurrent pregnancy loss, uterine anomalies, T-Shaped Uterus, Infertility, Diagnostic tool

### INTRODUCTION:

Infertility is defined as the inability to conceive after 12 months of regular cohabitation without use of contraception<sup>[1]</sup>. As mentioned by WHO Infertility is of two types - primary and secondary. Primary infertility refers to couples in whom pregnancy has never been established and secondary infertility is when at least one prior pregnancy has been achieved but are not able to conceive again. When coupled with recurrent pregnancy loss (RPL), defined as two or more consecutive miscarriages, it necessitates thorough evaluation to identify underlying causes, many of which are structural. Among the various diagnostic modalities available, Hysterosalpingography (HSG) offers a minimally invasive, cost-effective method to assess the integrity of the uterine cavity and fallopian tubes. A hysterosalpingogram (HSG) is an x-ray procedure used to see whether the fallopian tubes are patent (open) and if the inside of the uterus (uterine cavity) is normal. HSG is an outpatient procedure that usually takes less than 5 minutes to perform. It is usually done after the menstrual period ends but before ovulation. Despite the emergence of advanced imaging techniques such as sonohysterosalpingography and MRI, HSG remains widely utilized, especially in resource-limited settings, due to its accessibility and dual diagnostic-therapeutic role and cost effectiveness. Hysterosalpingogram (HSG) is an imaging procedure in which contrast dye is injected into the uterine cavity, progresses into the fallopian tubes, and ultimately reaches the fimbriated ends adjacent to the ovaries. Fluoroscopy and x-ray images are taken at various stages of the procedure to assess filling, uterine shape, tubal patency, and peritoneal spillage to evaluate the structure of the endometrial cavity and patency of the fallopian tubes. This diagnostic modality is primarily utilized in assessing female infertility. Structural endometrial cavity and fallopian tube abnormalities contribute significantly to infertility, with up to 60% of cases attributed to such issues.<sup>[2]</sup> HSG is considered a very safe procedure. However, there is a set of recognized complications, some serious, which occur less than 1% of the time. **1) Infection** The most common serious problem with HSG is pelvic infection. This usually occurs when a patient has had previous tubal disease (such as a past infection of chlamydia). In rare cases, infection can damage the fallopian tubes or make it necessary to remove the tubes. Patients should call their doctor if they experience increasing pain or a fever within 1-2 days of the HSG. **2) Fainting** Rarely, the patient may get light-headed during or shortly after the procedure. **3) Radiation Exposure** Radiation exposure from an HSG is very low, less than with a kidney or bowel

X-ray study. This exposure has not been shown to cause harm, even if a patient conceives later the same month. The HSG should not be done if pregnancy is suspected.

**4) Iodine Allergy** Rarely, a patient may have an allergy to the iodine contrast used in HSG. Patients should inform their doctor if they are allergic to iodine, (intravenous contrast dyes). Patients who are allergic to iodine should have the HSG procedure performed without an iodine-containing contrast solution. **5) Spotting** vaginal bleeding separate from menstrual period sometimes occurs for 1-2 days after HSG.[3]

This case study highlights the role of HSG in identifying intrauterine pathology in a woman with secondary infertility and recurrent pregnancy loss, guiding appropriate management and improving reproductive prognosis.

#### CASE STUDY: -

A 37-year-old woman presented to the Streerog opd at D. Y. Patil Ayurveda Hospital with complaints of inability to conceive for the past 8years. Her obstetric history revealed **gravida 9, para 0, abortion 9**, with all 9

pregnancies ending in first-trimester spontaneous miscarriages. Her last miscarriage occurred approximately 8 months ago, after which she was unable to conceive despite regular unprotected intercourse.

**Past Medical History:** K/C/O DM since 5yrs on regular treatment tab Glycomet 850 1bd, K/C/O HT Since 3.5yrs on treatment tab Olmin 10mg 1OD. K/C/O Hypothyroidism on Tab Thyronorm 12.5mcg since 1year

**Past Surgical history:** DNC done Thrice 1<sup>st</sup> and 2<sup>nd</sup> 7years back and last 8 months back.

**Family history:** no history of same illness in any of the family members.

**M /H-** LMP. 10-08-2024, duration: - 3-4 / 24-26 days, bleeding- bright red in colour, without foul smell, without clots/ dysmenorrhoea absent

**Married** - 8 years back.

**O/H** – G9 P0 L0 A9 D0

**Table No. 1: obstetric history**

|                                                      |
|------------------------------------------------------|
| G1 – A1 – 1.5 mnths - 2018 DNC                       |
| G2 – A2 – 2.5 months – 2018 DNC                      |
| G3 – A3 – 1.5 months – 2019 Medical Management       |
| G4 – A4 – 1.5months – 2019 Medical Management        |
| G5 - A5 – 2months – June 2020 Medical Management     |
| G6 – A6 - 2months – December 2020 Medical Management |
| G7 – A7 – 1.5months – 2021 – Medical Management      |
| G8 – A8 – 2months – 2022 – medical management        |
| G9 – A9 2.5months – December 2023 – DNC Done         |

**Table No. 2: Lab Investigations – DT: 21/09/24**

|               |           |
|---------------|-----------|
| HB            | 11.1gm/dl |
| WBC           | 8990      |
| PLT.          | 19000     |
| FBS           | 78.15     |
| PPBS          | 131       |
| HbA1c         | 6.2       |
| T3            | 157       |
| T4            | 15.63     |
| TSH           | 0.08      |
| HIV           | NEGATIVE  |
| HCV           | NEGATIVE  |
| HBsAG         | NEGATIVE  |
| LFT           | NORMAL    |
| RFT           | NORMAL    |
| URINE ROUTINE | NORMAL    |

**General examination:** Pulse, BP, Temp, RR - Normal

**Weight:** 57kg

**P/A-** Soft

**P/V-** Per vaginal examination was attempted but patient was absolute non cooperative and she started yelling on top of her voice with profuse sweating and became anxious so it wasn't possible for P/V or P/S.

#### USG PELVIS with TVS. – Dt. 11-09-24

Impression- Normal sized uterus, bilateral bulky ovaries, no other significant abnormality.

#### HSG – Dt. 11-09-24

Uterus is well opacified and shows T shape cavity, there is spill noted on rt side however there is no spill on left side S/O Fimbrial Block.

Many studies reported poor reproductive outcomes when this malformation was present. In 1992, Golan et al. (1992) demonstrated an association between T-shaped uterus and a high rate of first-trimester miscarriage (47%) and a low rate of full-term delivery (21%). [4]

Figure No. 1: Showing Hysterosalpingography film

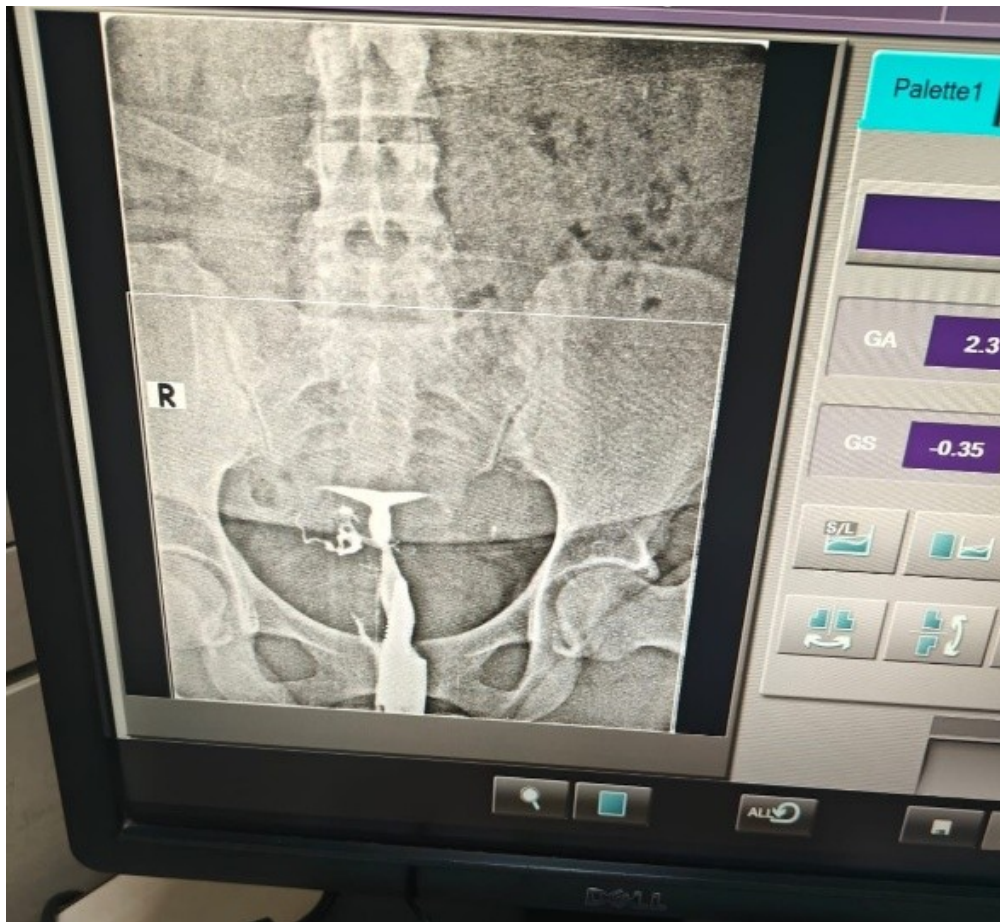


Figure No. 2: Showing USG of Pelvis

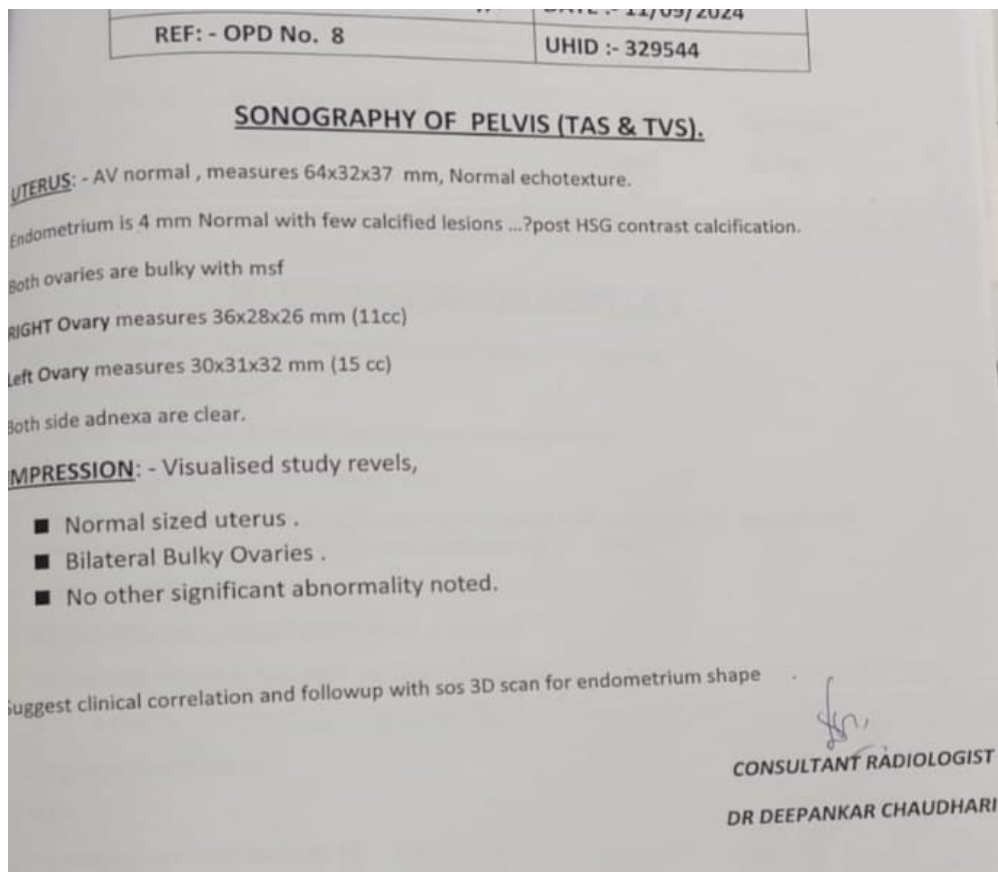


Figure No. 3: Showing X Ray Report

|                           |                     |
|---------------------------|---------------------|
| NAME :- MAMTA SAPKALE 37Y | DATE :- 11 SEP 2024 |
| SRV MAMTA HOSPITAL        | 329544              |

### XRAY FOR HSG

Diluted contrast is injected and few xrays are taken .  
 No reaction to contrast is seen in present scan .  
 Visualised study reveals,

- Uterus is well opacified and show T shaped .
- Bilateral fallopian tubes are opacified and thin .
- There is spill noted on right side .
- However there is no spill on left side .....s/o Fimbrial block .

**IMPRESSION:-**  
 "T" shaped uterus .  
 Fimbrial block seen on left side .

Figure No. 4: Showing Case Paper

2. Patient's Full Name Mrs Mamta Sapale

3. Patient's Address and Phone Number \_\_\_\_\_

4. Sex \_\_\_\_\_ Age 37y Weight \_\_\_\_\_

**Rx** Yo - BOH menstrual dys B.  
II Infertile  
- Scanty cycle  
- Dysmen.  
- Leuc. (+)  
- Bmj. Mild  
- Prem. Vln.

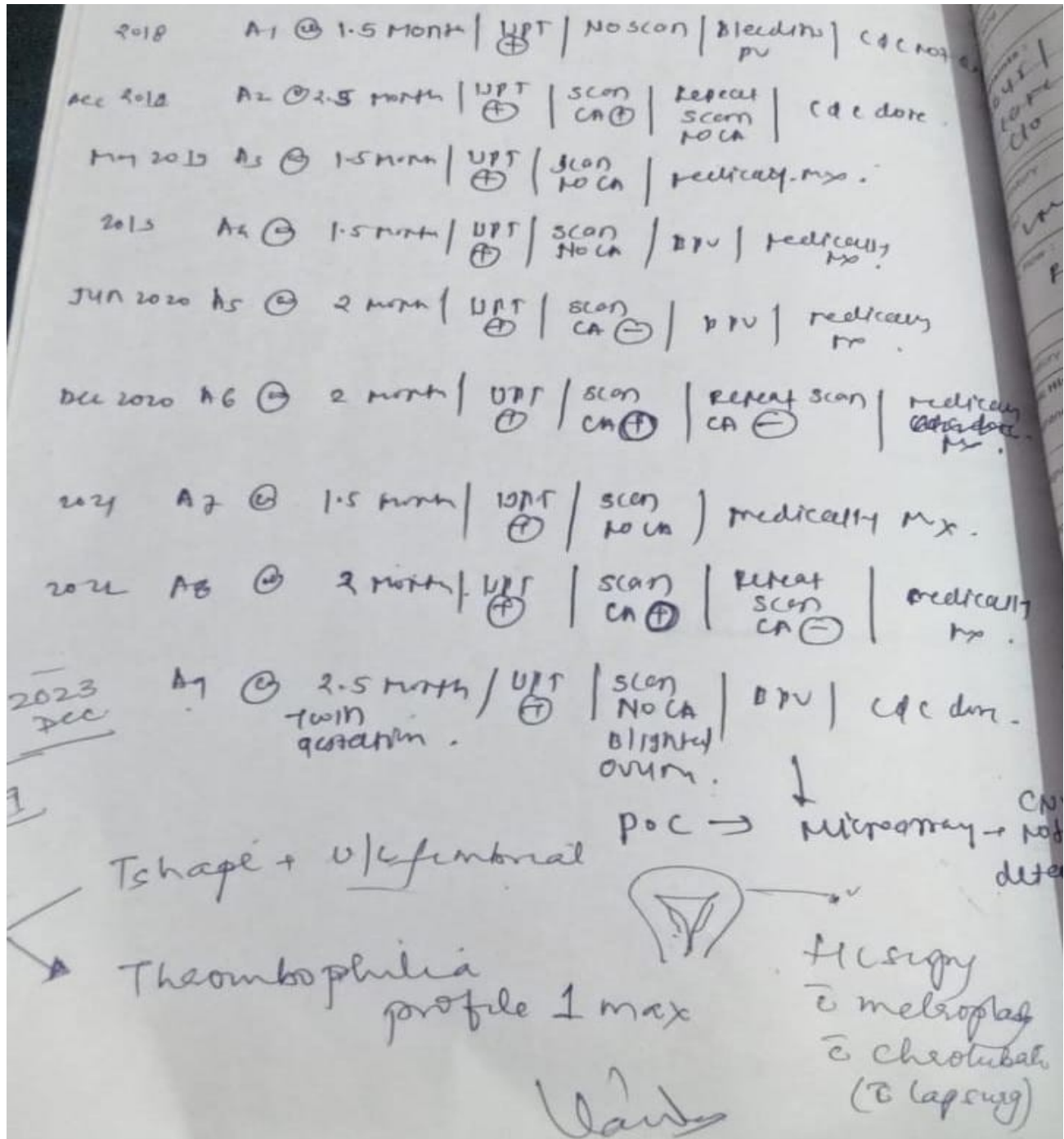
Plm/n KfclbDm syrs  
Pls/n HT (Took Kms for 3Y~)  
DNctwaice (smooth syrs Bnd.)

LMP: 10/08/2020  
14/7/2024.  
m/n 3-4 days Reg  
24-26 days  
On 8 8 8 8 8  
Last Dec 2023 (2nd)

Doctor's Signature & Date  
 Doctor's Stamp

N.M.M.C. Reg. No. - 306 (Not for Certificate/Receipt)

Figure No. 5: Showing History of patient



## DISCUSSION:

Hysterosalpingography (HSG) remains a cornerstone in the diagnostic evaluation of female infertility and recurrent pregnancy loss (RPL), yet its full potential is often underutilized. While widely recognized for assessing tubal patency, the diagnostic value of HSG in detecting uterine anomalies is frequently overlooked in clinical practice. HSG is traditionally associated with evaluating tubal factors in infertility, however this narrow perception can lead to significant diagnostic omissions. The ability of HSG to delineate intrauterine contour abnormalities — including Uterine anomalies

which are congenital malformations of the female reproductive tract, examples include Uterus didelphys (double uterus), arcuate uterus (uterus with a dent on the top part), Unicornuate uterus (one-sided uterus), Bicornuate uterus (heart-shaped uterus), Septate uterus (uterus with partition in the middle), T-shaped Uterus and absent uterus. These malformations may also affect the fallopian tubes, cervix, and upper vagina. Uterine anomalies may cause infertility or problems with pregnancy.[5] — HSG makes it an invaluable first-line tool not only in infertility but also in the investigation of Recurrent Pregnancy Loss.

In the case presented, a woman with nine pregnancy losses over eight years was never advised to undergo an HSG. This represents a serious gap in care, particularly given that a simple, accessible investigation could have revealed a correctable uterine anomaly at an earlier stage. This case underscores the necessity of recognizing HSG as a dual-purpose tool — both for assessing tubal function and for evaluating endometrial cavity morphology, which is critical in both implantation and maintenance of early pregnancy. HSG should be considered mandatory in the diagnostic workup of all infertility cases — whether primary or secondary, and regardless of whether the patient conceived naturally, with ovulation induction, or assisted reproductive techniques. Uterine anomalies can be present in women with prior pregnancies and may contribute to secondary infertility or recurrent pregnancy loss. The misconception that HSG is unnecessary in women who have previously conceived leads to missed diagnoses and delays in appropriate treatment. HSG offers a cost-effective, minimally invasive, and widely available modality that can provide critical diagnostic information early in the infertility workup. Its ability to assess both tubal patency and uterine contour in a single sitting justifies its use prior to more invasive or expensive investigations like diagnostic hysteroscopy or MRI. Moreover, when an abnormal HSG is identified, targeted use of hysteroscopy becomes more efficient and justified, improving diagnostic accuracy and therapeutic planning while reducing unnecessary procedures. In clinical practice, HSG is often considered a mandatory preliminary investigation prior to performing diagnostic or operative hysteroscopy. While hysteroscopy remains the gold standard for direct visualization of the uterine cavity and allows therapeutic intervention (e.g., hysteroscopic metroplasty), it is invasive, costly, and requires specialized equipment and expertise. HSG, by the use of contrast, is minimally invasive and provides sufficient information to guide decision-making regarding the need for hysteroscopic evaluation.

#### HSG findings can help:

- Justify the indication for hysteroscopy.
- Anticipate the complexity of intrauterine pathology.
- Rule out patients with normal uterine morphology, thereby avoiding unnecessary hysteroscopies.

In the case of a suspected T-shaped uterus, HSG offers high diagnostic yield and helps in planning the surgical correction. Following confirmation, hysteroscopic metroplasty can be offered to improve uterine morphology, with evidence suggesting improved pregnancy outcomes in select patients with RPL.[4]

#### CONCLUSION:

Hysterosalpingography is a valuable, cost-effective, and readily accessible diagnostic modality in the evaluation of patients with recurrent pregnancy loss. Its ability to detect uterine anomalies while simultaneously

assessing tubal patency, makes it indispensable in the initial diagnostic pathway. Furthermore, HSG should be considered a mandatory screening tool prior to hysteroscopy, optimizing patient selection for surgical intervention and ensuring judicious use of resources. Early identification and appropriate management can potentially improve reproductive outcomes and reduce the burden of recurrent pregnancy loss.

This case highlights the critical importance of including HSG as a routine, first-line investigation with all the blood investigations and hormonal assays in all infertility assessments, regardless of prior conception history or mode of attempted conception. The misconception that HSG is limited to tubal evaluation must be actively addressed in clinical protocols. Given its dual role in identifying both tubal and uterine factors, HSG should be treated as a mandatory modality in the comprehensive infertility and RPL workup. Early use of HSG could prevent years of unsuccessful attempts and psychological distress by facilitating timely diagnosis and intervention. Its ability to provide a clear image of the uterine contour and tubal patency in a single procedure which is done on opd basis, needing no anaesthesia makes it especially useful in the initial workup. Timely diagnosis of such anomalies enables more effective treatment planning and improves the prognosis for women experiencing Recurrent Pregnancy Loss.

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