

# Retrograde Dye Test for the Assessment of Tubal Patency in a Virgin: A Case Report and Review of Literature

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## Abstract

**Background:** Hysterosalpingogram (HSG) and Laparoscopy and dye tests for tubal assessment for a virgin who places high premium on her virginity could be challenging. Routine HSG may result in loss or damage to the hymen and loss of virginity. **Aim:** The aim of the procedure of retrograde dye test was explored to see the possibility of assessing tubal patency during laparotomy. **Case Presentation:** At laparotomy and after myomectomy in a 32 year old virgin, a moderate sized Wilkinson's cannula was gently inserted at the fimbrial end of the both tubes and 50mls of dilute Methylene-Blue solution was injected in each tube at a time to see whether the dye will appear at the vagina introitus. There was no resistance to flow of the dye in both tubes. Inspection of the vaginal introitus revealed a gush of dye flowing through it as the dye was introduced through each tube confirming the patency of both tubes. **Conclusion:** Retrograde dye test at the time of abdominal procedures like myomectomy, pelvic adhesiolysis and excision of endometriotic cyst can be cost effective. This procedure is also useful in assessing tubal patency for women who undergo laparotomy and also wish to preserve their virginity.

## Keywords

Tubal Patency Assessment, Retrograde Dye Test, Myomectomy, Virginity

## 1. Introduction

Tubal factor infertility is one of the commonest causes of female infertility in this setting due to sexually transmitted infections (STIs), accounting for 30% -

50% of cases [1] [2] [3] [4] [5].

Traditionally, tubal patency is evaluated using hysterosalpingography (HSG), Falloposcopy or laparoscopy and dye test [2] [5] [6] [7].

Each of these methods have their limitations, ranging from pain at the time of performing the procedure, need for specialized equipment and/or instruments, invasiveness and reliability and acceptability to the particular patient population [6] [7] [8] [9].

Occasionally, women turn up for fertility assessment evaluation preparatory to marriage and in anticipation of starting a family soon afterwards.

A lot of premium is placed on women maintaining their virginal status prior to marriage in this environment. It thus becomes a dilemma for women who want to evaluate their fertility status without having attempted to conceive yet, especially those women who are advanced in age or have other conditions that may compromise their fertility such as endometriosis [8] [9] [10]. In such women, evaluating tubal patency with the above mentioned methods of tubal patency testing is not acceptable as this will conflict with their desire to retain their virginal status.

In this regard, an attempt to assess tubal patency without performing HSG or laparoscopy or DHT becomes imperative.

We therefore attempted to assess tubal patency in a 32-year-old virgin via retrograde dye test at the time of performing an abdominal myomectomy.

The novelty in this case report is the attempt to demonstrate tubal patency in a patient with a potential tubal disease due to presence of myoma at the cornual end of one her fallopian tubes while conserving her virginal status by avoiding vaginal instrumentation.

## 2. Case Report

A 32-year-old nulligravida woman presented to the Gynaecology clinic with a history of swelling in her lower abdomen which had been progressively increasing in size with increased menstrual blood loss of 3 years duration. An ultrasound scan had earlier confirmed a diagnosis of multiple uterine fibroids. She had not attained coitarche. She was preparing for marriage and was anxious over her ability to conceive as soon as she is married. This is because she was aware that uterine fibroids may negatively affect her chances of conceiving spontaneously.

Over the preceding 3 months, her menstrual flow had increased significantly as evidenced by the number of sanitary pads she uses, which increased from one packet to two packets. There was associated lower abdominal pain. No abnormal vaginal discharge or intermenstrual bleeding.

No history of previous abdominal or pelvic surgery.

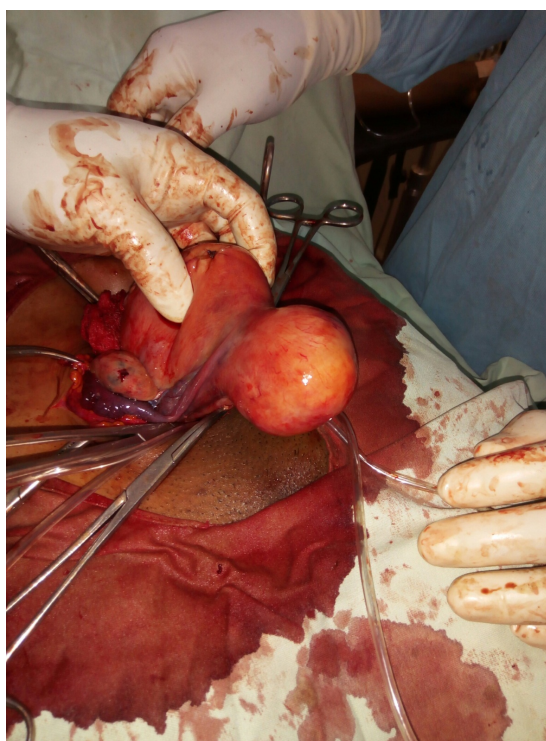
She was further evaluated and counseled for elective abdominal myomectomy to which she gave her consent. She was informed that an attempt will be made to assess the tubal patency by injecting dye (methylene blue) via the tubal ostium during the operation if it was found to be feasible to do so.

At laparotomy, the uterus was found to be enlarged with an irregular shape due to the multiple fibroids, located both intramural and subserous. The fundal height was equivalent to an 18 weeks pregnant uterus. The largest of the myoma was located in the anterior wall, it measure 8 cm by 5 cm in diameter. Another myoma was located at the right cornua, impinging on the right fallopian tube at its corneal end. It measure 5 cm by 3 cm in dimension. There were 10 other myoma seedlings of various sizes. The ampullary and fimbrial portions of the right tube appear normal except for the presence of the myoma at the cornual end (**Figure 1**). The left fallopian tube appear grossly normal.

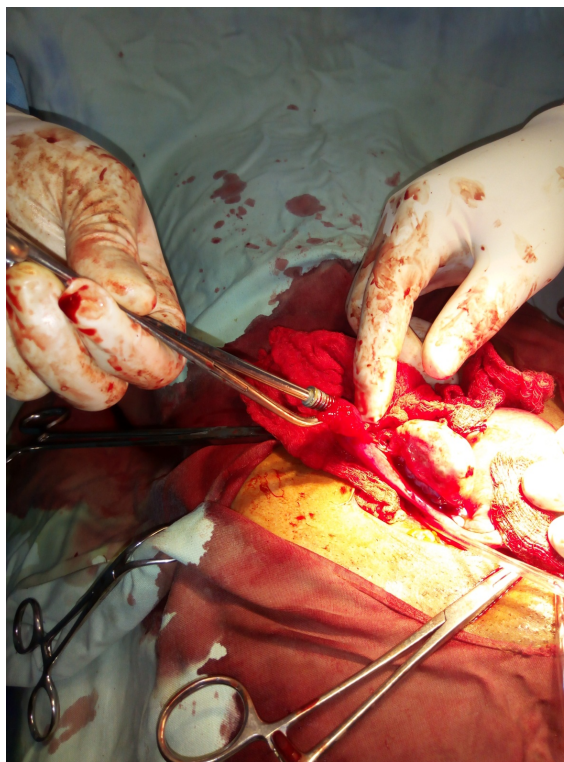
The myomas were enucleated and the cavities were closed using absorbable suture materials size 0 on round bodied needle in several continuous stitching. Care was taken to avoid taking large bites while repairing the cavity of the myoma on the cornual end of the right tube in order not to inadvertently occlude the fallopian tube.

A moderate sized Wilkinson cannula was gently inserted at the fimbrial end of the right tube and about 50mls of diluted methylene-Blue solution was injected (**Figure 2**). There was no resistance to flow and an assistant examined the vaginal introitus and noted the presence of the dye confirming right tubal patency. Similarly, the process was repeated on the left fallopian tube. There was also free flow of dye and a repeat examination of the vaginal introitus also revealed a fresh gush of dye, also confirming left tubal patency.

The myomectomy was completed by closing the rectus sheath with strong absorbable suture material using size 2 via interrupted suturing.



**Figure 1.** Note myoma at the cornual end of fallopian tube.



**Figure 2.** Dye been injected into the right fallopian tube via the fimbrial end.

The post-operative course was uneventful and the patient was discharged home on the third post-operative day.

On follow-up visit one week after discharge, there was no complaint and the surgical incision was healing satisfactorily.

Over the next four months, of follow-up, her surgical wound had healed satisfactorily and her menstrual blood loss had reduced significantly to a level that she was satisfied with.

### 3. Discussion

Traditional methods of tubal patency evaluation in the work-up for fertility assessment may not be applicable to all patient categories. For couples already engaging in vaginal penetrative intercourse, HSG, laparoscopy and dye test may not pose any challenge as far as retaining virginity is concerned.

However, for women who are not yet engaging in sexual intercourse and hope to maintain their virginity until after marriage, these methods cannot be applied as the procedure may lead to interference with the hymenal membrane, thus resulting in loss of virginity even though in the absence of vaginal intercourse. Thus, this method of assessing Fallopian tube patency may be explored, using the opportunity presented when performing an abdominal myomectomy to perform a retrograde dye test via the fimbrial end of the Fallopian tube.

This case is made more important by the presence of a long history of uterine fibroids and the intra-operative finding of a myoma located right at the cornual

tubal end, thus potentially causing a cornual tubal blockage of that tube.

The procedure is simple, not harmful and does not significantly prolong the duration of the operation. The procedure can be applied to other patient categories that did not undergo HSG during the workup to the operation for various reasons which may include outright refusal due to fear of pain associated with the procedure [8] [9] [10] or financial constraints.

It can also be used to detect tubal blockage intra-operatively in cases where tubal surgery is been considered to locate the exact site or sites of blockage [11] [12].

Besides using a Wilkinson cannula, any flexible plastic or latex or catheter can also be used to achieve similar results. Moreover, a plastic or rubber catheter or cannula which may be associated with less trauma to the fimbria is preferable. In more advanced settings, laparoscopic retrograde tubal canalization and dye test can be in place of laparotomy and same results can be achieved.

Note however that this method of tubal patency testing should not be employed for routine use. It is an opportunistic method and it may find other applications in cases of testing following laparoscopic tubal re-anastomotic surgeries.

In this patient, despite the presence of myoma at the cornual end of the tubes, both tubes were found to be patent as evidenced by the presence of dye in the vagina (**Figure 1** and **Figure 2**). In patients in which only a small segment of the fallopian tube blocked, tubal flushing or tubal canalization can be carried out at a later time to attempt to overcome the blockage [13] [14].

#### 4. Conclusion

For women who are concerned about their fertility status and these residing in fibroid endemic regions, retrograde dye test at the time of abdominal procedures such as myomectomy, pelvic adhesiolysis and excision of endometriotic cysts can be cost effective. It is also useful in preserving virginity for women who express reservations about undergoing HSG or laparoscopy and dye test during fertility evaluation as these procedures may interfere with their virginity status.

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