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# **Transrectal Ultrasound and 3D Transabdominal Ultrasound in comparison to vaginoscopy in Virgins with suspected genital tract lesions**

*Thesis*

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# *List of Abbreviations*

Abb.	Full term
2D US .....	Two-dimensional ultrasound
3D US .....	Three-dimensional ultrasound
ACOG .....	American College of Obstetricians and Gynecologists
AEH .....	Atypical endometrial hyperplasia
AIUM.....	American Institute of Ultrasound in Medicine
ASRM .....	American Society of Reproductive Medicine
AUB .....	Abnormal uterine bleeding
CONUT.....	Congenital Uterine Anomalies
CT .....	Computed tomography
CUA .....	Congenital uterine anomalies
DES.....	Diethylstilbestrol
DUB.....	Dysfunctional uterine bleeding
EC .....	Endometrial cancer
ESHRE .....	European Society of Human Reproduction and Embryology
FIGO.....	The International Federation of Gynecology and Obstetrics
HMB .....	Heavy menstrual bleeding
MDAs.....	Mullerian duct anomalies
MRI.....	Magnetic resonance imaging
MRKH .....	Mayer-Rokitansky-Kuster-Hausen
NICE.....	The National Institute for Health and Care Excellence
OHVIRA .....	Obstructed Hemivagina and Ipsilateral Renal Agenesis
PCOS .....	Polycystic ovary syndrome

## *List of Abbreviations Cont...*

Abb.	Full term
PMB.....	Postmenopausal bleeding
TAUS.....	Transabdominal ultrasonography
TRS.....	Transrectal sonography
TRUS.....	Transrectal ultrasonography
TVUS.....	Transvaginal ultrasound
US.....	Ultrasonography

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# INTRODUCTION

Virginity is a very private issue; saving or losing it is a matter of choice depending on age, ethnicity, religion, or simply personal decision. Post pubertal teenage girls, religious women such as nuns, and women in some countries tend to be virgin. This situation must be respected by medical professionals. But when a vaginal examination is necessary, virginity might be a limiting factor for the gynecologist in diagnosis and treatment (*Kucuk, 2007*).

Vaginal discharge or bleeding is the symptom most commonly reported by adolescent girls that are referred for gynecologic problems. The most common cause of vaginal discharge at these ages is infection due to a hypoestrogenized vagina, although other potential causes, such as congenital anomalies of the genitalia, trauma, foreign bodies, sexual abuse, and malignant disease, must also be excluded. With regard to virginity and childbearing possibility in the future, a careful approach is of paramount importance (*Nakhal, 2012*).

Hymenal tissue does not easily tolerate vigorous manipulation and wide movements. When needed, potential hymeneal disruption may be discussed with mature women or with the parents of adolescent girls for the sake of correct diagnosis and treatment; but in general, they are highly resistant to that (*Kucuk, 2007*).

When a reproductive tract examination or transvaginal operation must be arranged for a virgin, the operator faces a challenge and may hesitate to utilize hysteroscopy, which can result in a delayed diagnosis or improper treatment.

The most common indication for hysteroscopy is abnormal vaginal bleeding in virginal patients and has been widely used for uterine cavity examination and management. Although the possibility of hymen preservation is high, virgins are highly resistant to this procedure. This may be due to a belief that the procedure causes disruption of virginity and worries associated with their future partners (*Cheong, 2010*).

The vaginoscopic and hysteroscopic approach with a hysteroscope provides a safe and non-traumatic method in assessing the reproductive organs because the scope of the hysteroscope is advanced into the vagina without a speculum or tenaculum. Distension of the vaginal wall by distension medium can in turn provide a clear endoscopic view .

These considerations have made clinicians opt for these procedures in assessing pathologies of the vagina, the surface of the cervix, the cervical canal, and the intrauterine cavity and other developmental anomalies of the sex organs in patients. Furthermore, the entire procedure can be undertaken without disrupting integrity of the hymen, whereas the traditional method requires the use of retractors and, therefore, disrupts this integrity (*Johary, 2015*).

Although hysteroscopy can improve diagnosis and thereby improve quality of life, virgins may decline this procedure. Patients with delayed diagnosis and management in some uncommon but serious situations, such as endometrial malignancy, are life-threatening (*Cheong, 2010*).

So far, only a few reports have discussed the protection of hymen integrity in hysteroscopy, and the physical and psychological impacts of this surgery in virgins are not conclusive. This is an important issue that gynecologists encounter, but which has seldom been discussed. Intravenous sedation is recommended to reduce the patient's anxiety and pain, avoid vasovagal reaction, relax the buttock muscles and reduce the risk of hymenal trauma. Unlike operative hysteroscopy, loop electrode cannot be employed in mini-hysteroscope; therefore, for some diseases like submucous leiomyoma or uterine septum, mini-hysteroscopy is not therapeutically beneficial, and this should be explained to the patients in advance. Adequate preoperative counseling is also necessary to emphasize the importance of the procedure and to lessen their anxiety (*Cheong, 2010*).

In virgin patients when vaginal examination cannot be done ultrasonography is a useful adjunct to inspection of the external genital organs (*Güdücü, 2012*).

Currently there are three accepted and more or less widely used modalities to image the contents of the female pelvis. Transabdominal sonography (TAUS) was the first to be

used and is still the most widespread (*Timor et al., 2003*). By using a full urinary bladder as an acoustic window, ovaries, uterus, and superior vagina can be clearly examined using transabdominal ultrasonography (*Yang et al., 2017*).

Transvaginal sonography provides clear images of the region of interest, provided that the targeted organ is within the focal range of the probe, and that the probe is placed in proximity to the organ in question. There are only a few real disadvantages of TVS. Agenesis of the vagina, a vaginal introitus and the fear of introducing infection such as in the case of premature rupture of the membranes are some of the more common situations in which TVS is not possible or is relatively contraindicated.

In such cases introducing a commercially available vaginal probe through the anal sphincter into the rectum seems to be a reasonable alternative to image the female pelvic structures within ‘reach’ of the probe. We present a study to compare TAUS and transrectal sonography (TRS) in a group of patients in whom TVS was not possible (*Timor et al., 2003*).

Transrectal sonography (TRUS) has been widely used in men as a diagnostic tool for prostate cancer. Its value in the management of disorders of the lower urinary tract in women and as an alternative to intraoperative gynecologic sonography has also been documented. Case reports in the radiological literature attest to the fact that it has been used to guide drainage of inflammatory pelvic collections (*Nelson et al., 2000*).

## AIM OF THE WORK

The aim of the study is to compare the feasibility and test performance of 3D transbdominal ultrasound and Transrectal ultrasound in the detection of local lesions in the uterus, cervix and vagina compared to the final diagnosis confirmed by vaginoscopy as a golden standard modality of diagnosis in Virgin Patients.

### **Research question:**

In Virgins with suspected genital tract lesions, do 3D transbdominal ultrasound and Transrectal ultrasound differ in feasibility and have comparable accuracy to vaginoscopy (the golden standard modality of diagnosis) in the detection of local lesions in the uterus, cervix and vagina?

### **Null hypothesis:**

There is no difference in feasibility and test performance 3D transbdominal ultrasound and Transrectal ultrasound in the detection of local lesions in the uterus, cervix and vagina compared to the final diagnosis confirmed by vaginoscopy as a golden standard modality of diagnosis in Virgin Patients.