COLOR DOPPLER FLOW IMAGING IN EVALUATION OF TUBAL PATENCY

Thesis

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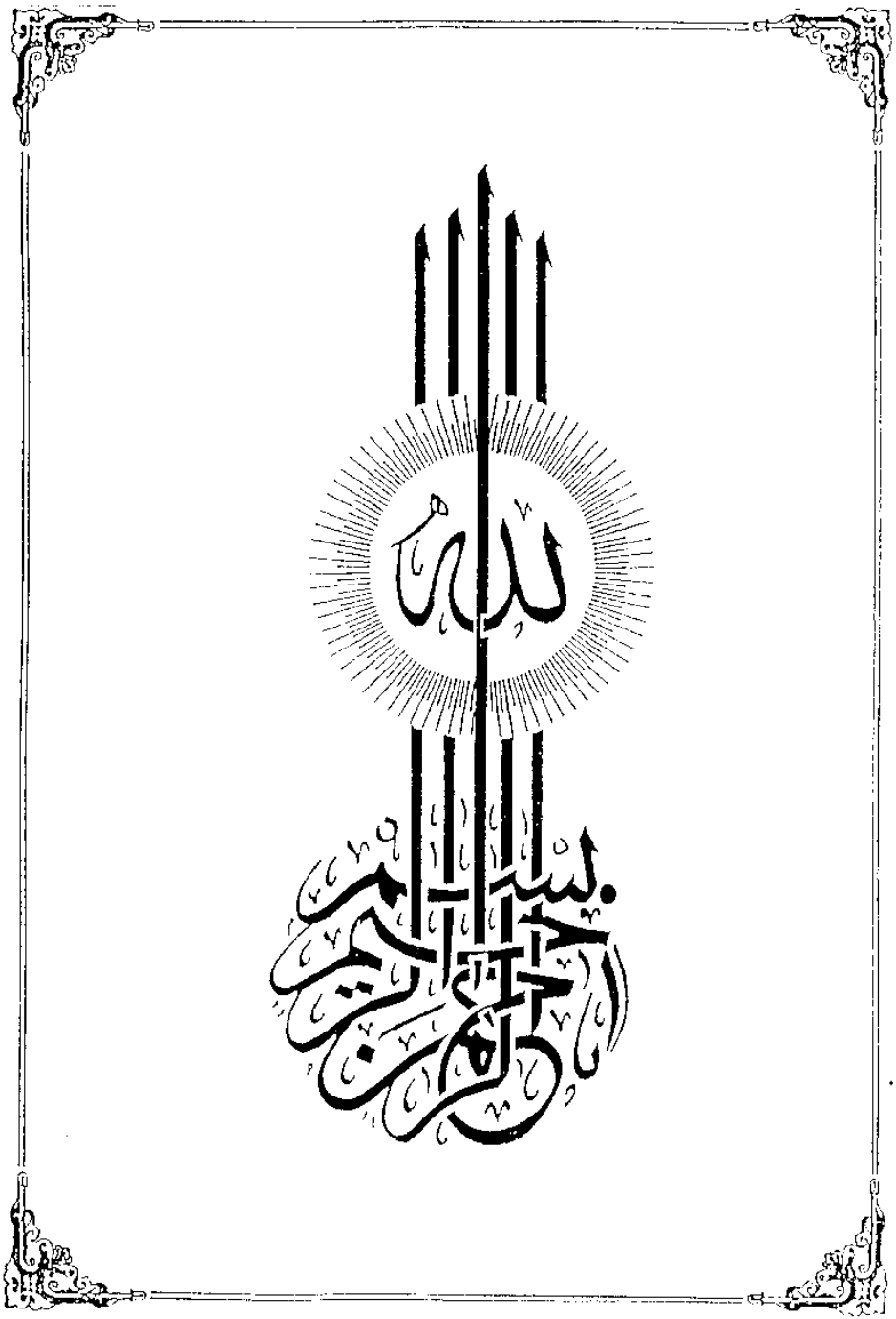

Abstract

Khaled Mohamed El- Hanafy

Color Doppler flow imaging of tubal patency

Transvaginal color Doppler sonography (TVCDS) is described as a new method for direct imaging of the tubal passage in tubal diagnostics. Transvaginal color Doppler sonography was used in 20 patients with primary or secondary infertility. Hysterosalpingograph (HSG) and laparoscopy with dye chromotubation were done in 19 patients of them . The results of the 3 methods of testing tubal patency were compared to each other, taking laparoscopy with dye chromotubation as the gold standard. The results were statistically analysed giving the following data: sensitivity, specificity, positive predictive value, negative predictive value and accuracy of TVCDS of 50%, 90%, 57.14%, 87.1%, and 81.58% respectively. While HSG found to have sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of 62.5% , 86.66%, 55.55% , 89.65%, and 81.58% respectively. Using Mc Nemar test there was no significant difference between TVCDS and HSG.

Conclusion : TVCDS is a simple office procedure which should be used in the preliminary assessment of the fallopian tube patency.

Its use will reduce the need for hysterosalpingography and in some cases for laparoscopy.

Key words : Fallopian tube patency – transvaginal color Doppler sonography – Hysterosalpingography – Laparoscopy with dye chromotubation.

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INTRODUCTION

Introduction

The desire of women for children is sometimes stronger than self-interest in beauty and figure, and may be stronger than the claims of a career : in men it is less intense. Childlessness may be a tragedy to the married woman, and can be a cause of marital upset as well as of personal unhappiness and ill health. The having of children cements a marriage and, when a breakdown of the partnership is threatened as it is at some stage in many if not most marriages - the future welfare of their offspring may deter man and wife from separating; it thus gives time and opportunity for reconciliation and adjustment which may result in permanent and happy union. The importance of children is illustrated by the fact that, in England and Wales, two - thirds of the large number of divorced couples have no children, or only one child (Tindal 1987).

Infertility has many causes of which tubal factors constitute a major entity. Tubal and peritoneal factors comprise approximately 25% of the etiologies of infertility (Seibel , 1990) .

The "normal" fallopian tube is critical to natural conception. Subtle variations in tubal anatomy have been cited as making significant contribution to infertility. Fallopian tubes play an important role in sperm and ovum development and ciliary and muscular activities are important elements in ovum transport (Tufekci et al., 1992). A history of pelvic inflamatory disease,

septic abortion, intrauterine device use, ruptured appendix, tubal surgery or ectopic pregnancy allerts the physitian to the possibility of tubal damage. Almost one-half of patients who are eventually found to have tubal damage and / or pelvic adhesions, however, have no history of antecedent disease(Speroff et al., 1989). Most infertile couples will require an evaluation for the presence of these factors.

Because of the great importance of tubal factor, several methods were employed to test for tubal patency. Douay in his report before the fifth congress of the association of French Gynaecologists and Obstetricians at Loyns, Septemper, 1927, stated that Le Lorier was the first to inject an isotonic non-irritant fluid into the uterine cavity with the object of determining tubal patency. Le Lorier believed that if 20 ml of this fluid were irjected and not returned from the cervix, it was a proof that the fallopian tubes were patent. According to Douay's report also, Dimier deserve credit for being among the first to inject a radio-opaque fluid into the uterus. Dimier attempts were made in 1913, he injected 7 - 8 ml of 10% collargol solution. One patient died from peritonitis (Rubin, 1947). Lipidol was first introduced by Siccard and Forestier in 1922, and first used in gynaecology by Carl Heusser in 1923. Other contrast media soon thereafter came into use.

In Novemeber 1919, Rubin began to use oxygen for injection into the uterus then replaced oxygen by CO_2. Since 1920, Rubin's test became a very common and widely used test for determination

of tubal patency or non patency. Rubin, 1947, in his book "Utero-tubal insufflation" presented a diagnostic method of insufflating CO_2 gas through the cervix with pressure record tracing to test the patency of the tubes. Speck, 1948 published a new test for determination of tubal patency known as phenolsulfonphthalein (PSP) test or "Speck test". Horne and Casey,1963, were studying the presence of actively swiming sperms found in the peritoneal fluid or tubal washing of sterile women. Ansari,1968, descriped a new test for evaluating tubal patency refered to as methylene blue test.

Descending tests which are based on the detection in the vagina of a substance injected into peritoneal cavity either through the pouch of Douglas or through the abdominal wall. By such descending tests, it is theoritically possible to study not only the patency but also the function of apprehension and transportation by the fallopian tube.

Decker and Cherny,1944, advocated visually controlled insufflation of the tubes through a telescopic optical apparatus passed through the punctured posterior fornix under saddle block anaesthesia, or under local anaesthesia with the patient in the knee chest position. Other endoscopic procedures are also employed for diagnosis of tubal patency including laparoscopy with dye chrompertubation, hysteroscopy and falloposcopy.

Untill recently, the diagnosis of tubal factor has been made by hysterosalpingography (HSG) and/or chromopertubation at the time of laparoscopy (Stern et al.,1992).

Recent technological advances in ultrasound imaging have contributed greatly to patient care in the feild of obstetrics and gynaecology. Of particular importance was the recent development of high- frequancy transvaginal sonography, which is emphasized by its extensive application in the various feilds of obstetrics and gynaecology. such applictions include monitoring of follicular development, follicle aspiration and various puncture procedures, and scanning of the endometrium, the ovaries, and abnormal pelvic structures . Another important area is scanning in early pregnancy, which enables the monitoring of embryonic development and detection of developmental abnormalities from as early as the first and early second trimesters .

A new and exciting development has emerged with the introduction of the transvaginal image-directed pulsed Doppler system (or pulsed-duplex Doppler system). This is obtained by incorporating a pulsed, range-gated Doppler into the transvaginal two-dimensional B-mode real-time scanner, transforming it into a high-quality "flow probe," which offers a novel approach to the noninvasive hemodynamic evaluation of the female pelvis, in both the pregnant and the nonpregnant situations (Thaler et al.,1991).

Ultrasonic evaluation of fallopian tubes presents one of the greatest challenges for the sonographer because of the use of 3.5 or 5 MHz transducers and because the fallopian tube is a poor sonic reflector. It may now seen more logical that a transvaginal probe using a higher frequency transducer crystal should overcome the above mentioned limitations (Timor-Tritsch et al., 1991).

Some studies had made to evaluate the use of ultrasound, abdominal and vaginal, in the investigation for tubal patency. Few studies used color Doppler for this purpose.

AIM OF THE WORK

Aim of the work

To investigate the role of color Doppler ultrasound, using vaginal probe, in the assessment of tubal patency and to evaluate its results with the results obtained by hysterosalpingography and chromopertubation done at laparoscopy.

Review of literature