Color Doppler Changes in Polycystic Ovarian Syndrome

Thesis
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By:

Marwa Fadel Fahmy Mostafa
M.B.B.Ch

Supervisors

Prof. Abdelsalam Abdelhamid Eldawakhly
Professor of Obstetrics & Gynecology
Faculty of Medicine
Cairo university

Prof. Hassan Omar Ghareeb
professor of Obstetrics & Gynecology
Faculty of Medicine
Cairo university

Dr . Dalia Abdalla Gaber
Lecturer of Obstetrics & Gynecology
Faculty of Medicine
Cairo university

Faculty of Medicine
Cairo university
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تقييم تدفق الدم للمبيضين فى مرض تكيس المبيضين بإستخدام الدوبلر الملون

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مروه فاضل فهمى مصطفى

بكالوريوس الطب والجراحة

كلية الطب . جامعة عين شمس

تحت إشراف

أ.د/عبد السلام عبد الحميد الدواخلى

أستاذ النساء والتوليـد

كلية الطب . جامعة القاهرة

أ. د/ حسن عمر غريب

أستاذ النساء والتوليد

كلية الطب . جامعة القاهرة

د/داليا عبدالله جابر

مدرس النساء والتوليد

كلية الطب . جامعة القاهرة

كلية الطـــــب

جامعة القاهرة

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This effort is dedicated to my

Parents,

And

My Family

List of Abbreviations

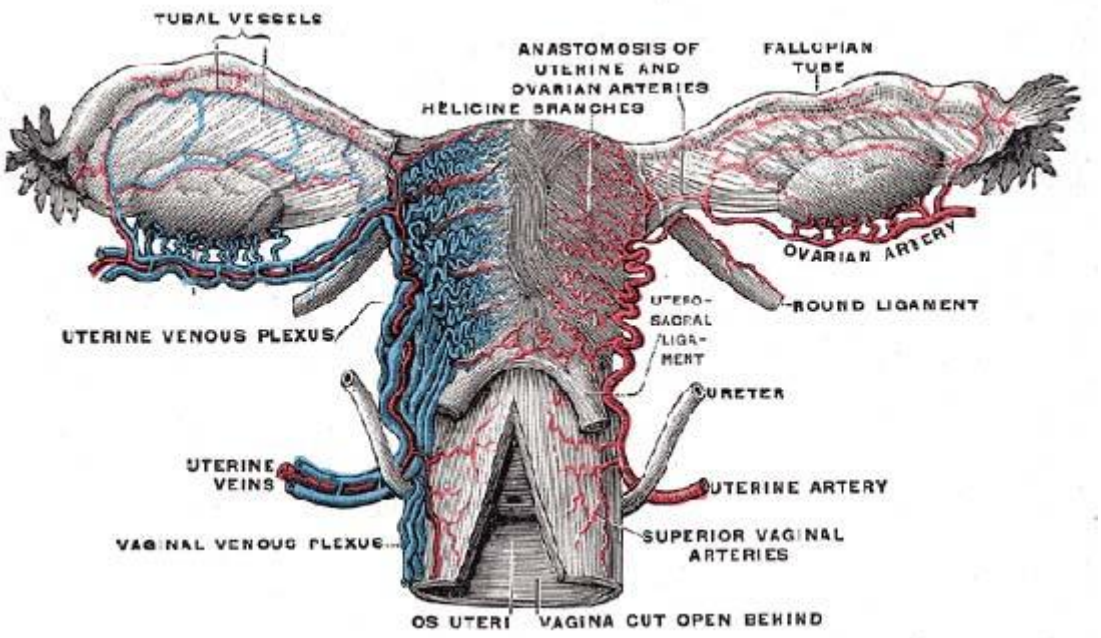
٢D	Two dimensional
٣D	Three dimesional
BMI	Body mass index
CC	Clomiphene citrate
DHEA	Dehydroepiandrosterone
DHEAS	Dehydroepiandrosterone sulfate
FSH	Follicular stimulating hormone
GnRH	Gonadotrophin releasing hormone
IGF-١	Insulin like growth factor ١
IGF-٢	Insulin like growth factor ٢
IGFBP	Insulin like growth factor binding protein
MFO	Multifollicular ovary
PCOD	Polycystic ovarian disease
PCOS	Polycystic ovarian syndrome
PI	Pulsatility index
RI	Resistance index
S/D	Systolic diastolic ratio
SHBG	Sex hormone binding gloublin
TA	Transabdominal
TSH	Thyroxine stimulating hormone
TVS	Transvaginal ultrasound

CONTENTS

List of tables

List of Figures

Anatomy



The ovaries are homologous with the testes in the male. They are two nodular bodies, situated one on either side of the uterus in relation to the lateral wall of the pelvis, and attached to the back of the broad ligament of the uterus, behind and below the uterine tubes . The ovaries are of a grayish-pink color, and present either a smooth or a puckered uneven surface. They are each about ٤ cm. in length, ٢ cm. in width, and about ٨ mm. in thickness, and weigh from ٢ to ٣,٥ gm. Each ovary presents a lateral and a medial surface, an upper or tubal and a lower or uterine extremity, and an anterior or mesovarion and a posterior free border. It lies in a shallow depression, named the ovarian fossa, on the lateral wall of the pelvis; this fossa is bounded above by the external iliac vessels, in front by the obliterated umbilical artery, and behind by the ureter. The exact position of the ovary has been the subject of considerable difference of opinion, and the description here given applies

to the ovary of the nulliparous woman. The ovary becomes displaced during the first pregnancy, and probably never again returns to its original position. In the erect posture the long axis of the ovary is vertical. The tubal extremity is near the external iliac vein; to it are attached the ovarian fimbria of the uterine tube and a fold of peritoneum, the suspensory ligament of the ovary, which is directed upward over the iliac vessels and contains the ovarian vessels. The uterine end is directed downward toward the pelvic floor, it is usually narrower than the tubal, and is attached to the lateral angle of the uterus, immediately behind the uterine tube, by a rounded cord termed the ligament of the ovary, which lies within the broad ligament and contains some non-striped, muscular fibers. The lateral surface is in contact with the parietal peritoneum, which lines the ovarian fossa; the medial surface is to a large extent covered by the fimbriated extremity of the uterine tube. The mesovarian border is straight and is directed toward the obliterated umbilical artery, and is attached to the back of the broad ligament by a short fold named the mesovarium. Between the two layers of this fold the blood vessels and nerves pass to reach the hilum of the ovary. The free border is convex, and is directed toward the ureter. The uterine tube arches over the ovary, running upward in relation to its mesovarian border, then curving over its tubal pole, and finally passing downward on its free border and medial surface.y

Anatomy of uterine arteries:

The Uterine artery arises from the anterior division of the internal iliac artery and after it courses towards the cervix, it divides into an ascending uterine branch and a descending vaginal branch from the cervicocorporeal junction the uterine artery ascends along the lateral aspect of the uterus to

the cornua, from which an adnexal branch is given off to supply the ovary **(Levi et al., ١٩٨٨).** The uterine arteries anastomose externally with each other through anterior and posterior arcuate vessels seen in the outer third of the myometrium **(Fleischer et al., ١٩٩١).** Radial arteries extend towards the endometrium , but usually are not seen in the non-gravid patient**. (Schiller and Grant ,١٩٩٢).**

Polycystic ovarian disease

Polycystic ovary syndrome (PCOS) is a syndrome of ovarian dysfunction. Its cardinal features are hyperandrogenism and polycystic ovary morphology (**Laven et al., ٢٠٠٢)**. Hyperandrogenism is characterized clinically by hirsutism, acne, and androgen-dependent alopecia and biochemically by elevated serum concentrations of androgens, particularly testosterone and androstenedione. Obesity is common but not universal. (**Yen et al., ١٩٧٠)**. Typically, these features are associated with hypersecretion of luteinizing hormone and androgens but with normal or low serum concentrations of follicle-stimulating hormone**. (Holte et al., ١٩٩٤).** Although the early descriptions of the syndrome were based on ovarian morphology(**Zawadzi et al., ١٩٩٢)**, this has not been considered an essential requirement for the diagnosis. The recent application of modern, high-resolution diagnostic ultrasonography has again tipped the balance toward a more morphologically based diagnosis (**Pache et al., ١٩٩١**).

PREVALENCE

Although it has long been known that the polycystic ovary syndrome is an important cause of anovulation and hirsutism, few studies have attempted to define its prevalence in women with these symptoms **.** Ultrasound evidence of polycystic ovaries is seen in ٢٠-٢٣٪ of apparently normal women, but the prevalence of polycystic ovaries is increased in women with reproductive failure **(Farquhar., et al ١٩٩٤)** . Women presenting with recurrent miscarriage have been shown to have a prevalence of polycystic ovaries ranging from ٤٤-٨٢٪. In a large series of ٥٠٠ consecutive women attending a specialized recurrent miscarriage

clinic, prevalence of polycystic ovaries on ultrasound, scanning was ٥٦٪ **(Clifford., et al ١٩٩٤).** In a study of ١٧٥ anovulatory women presenting consecutively to a reproductive endocrine clinic, ٣٠ percent of those with amenorrhea and ٧٥ percent of those with oligomenorrhea had ultrasonographic evidence of polycystic ovaries. More than ٦٠ percent of these women were hirsute, and ٩٠ percent had elevated serum concentrations of luteinizing hormone or androgens (or both) **(Franks, ١٩٨٩)** .These findings are supported by a study in which clinical and biochemical, rather than ultrasonographic criteria were used to make the diagnosis of polycystic ovary syndrome **(Hull , ١٩٨٧)**. Subsequently, clinical and biochemical markers of the syndrome were correlated with ultrasonographic results, and a high degree of concordance was observed between the findings (**Fox et al., ١٩٩١)**.

The recognition of polycystic ovaries in women with regular menstrual cycles is an important finding. First, it belies the idea that the polycystic morphology simply indicates a nonspecific response of the ovary to chronic anovulation. Second, the evidence that this group of women shares the biochemical, as well as the morphologic, characteristics of anovulatory women with polycystic ovaries suggests that the former group represents a particular presentation of the same underlying disorder. Third, it relegates the diagnosis of idiopathic hirsutism to the minority of women with hyperandrogenism alone.

It is a moot point whether patients with polycystic ovaries, hyperandrogenism, and regular menses should be considered to have the polycystic ovary syndrome **(Jacobs et al., ١٩٨٧) .**They do not fit the classic definition of the syndrome, which includes anovulation, but there is clearly considerable overlap between this group and those with