

# The Prevalence of uterine septum in polycystic ovarian syndrome (PCOS), a series of 49 cases

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## Abstract

### Objective

To estimate the prevalence of uterine septum in patients with polycystic ovarian syndrome(PCOS) that were investigated for infertility after failure to achieve pregnancy with ovulation induction in a high-incidence area, such as Middle East.

### Design

A prospective observational study

### Methods

A 49 patients from a total of 172 patients seeking fertility advice at a specialised fertility clinic in Amman, Jordan, during the period of September 2017 to July 2018 with confirmed polycystic ovarian syndrome were screened for the presence of congenital uterine anomalies by a hysterosalpingogram(HSG). The anomalies were classified according to the American Fertility Society classification. If an anomaly was suspected a diagnostic laparoscopy and hysteroscopy were performed to confirm the diagnosis.

### Results

15 patients (31%) of the 49 patients with confirmed diagnosis of polycystic ovarian syndrome were confirmed to have uterine anomalies; 11 patients had a uterine septum, three patients had an arcuate uterus and one patient had a bicornuate uterus.

### Conclusion

There is association between PCOS and uterine septum. This study hopes to enlighten infertility clinicians about the presence of uterine factor in PCOS patients (31%) and the need to screen for this congenital anomaly at their first consultation before embarking on the time-consuming and costly process of ovulation induction.

**Keywords:** PCOS, Infertility and Uterine septum.

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## Introduction

Polycystic ovarian syndrome (PCOS) is the commonest cause of chronic hyperandrogenic anovulation and the most common single cause

of infertility in young women (1,2). To diagnose a patient with this metabolic syndrome we need two out of three criteria from (ESHRE/ASRM 2003) which requires the

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presence of oligo/ anovulation, hyperandrogenism and/ or polycystic ovaries on ultrasound (3).

The cumulative singleton live birth rate in PCOS patients reaches 72% (4,5) by using several methods of ovulation induction, lifestyle modification as weight reduction, metformin (insulin sensitizer) and laparoscopic ovarian drilling. If pregnancy fails to be achieved with successful induction of ovulation and a male factor is ruled out, other factors should be investigated. Anatomical cause, such as uterine or tubal factor may be screened by imaging study such as Hysterosalpingogram (HSG). If uterine anomaly is diagnosed, then we need further investigations such as MRI, 3D pelvic ultrasound or an invasive procedure such as a combined laparoscopy and hysteroscopy to confirm the type of the anomaly, to differentiate between bicornuate and uterine septum and proceed to septum resection once confirmed. Uterine anomalies are associated with poor reproductive outcome, leading to reduced pregnancy rates and increasing the risk of miscarriage and preterm delivery (14).

Mullerian anomalies in general are associated with renal abnormalities in 11-30% of patients. However, there is no evidence to confirm association between septate uterus and renal anomalies and thus screening for renal tract anomalies is not recommended. (15)

### Subjects and Methods

This prospective cohort study, which was conducted at a specialty fertility clinic in Amman, Jordan, included 49 consecutive patients from a total of 172 patients seeking fertility advice between September 2017 and July 2018.

Patients were diagnosed with polycystic ovarian syndrome (PCOS) according to the Rotterdam criteria (3). Physical examination was done for all cases on the first visit. Our main

modality for diagnosis for PCOS was clinical history and ultrasonographic scans done for all patients by the same investigator (first author) using a Samsung Medical Systems Madison © R7 ultrasound machine with a 5–9 MHz transvaginal transducer. The American Fertility Society (AFS) classification of Müllerian anomalies was used to diagnose and categorize uterine anomalies [6].

PCOS diagnosis was based on the Rotterdam ESHRE/ASRM-sponsored PCOS consensus workshop group criteria, namely, the ultrasonographic morphological criteria of the polycystic ovaries plus at least one clinical or biochemical evidence of hyperandrogenism and/or signs of ovulatory dysfunction [3]. As radiologic methods have improved over the past 20 years, the diagnosis of a septate uterus is typically made using radiographic rather than surgical techniques.

While hysterosalpingography (HSG) is often the initial test that provides evidence for a mullerian anomaly in patients with infertility or recurrent pregnancy loss, the diagnostic accuracy of the HSG is low for distinguishing septate and bicornuate uteri. Indeed, compared with hysteroscopy/ laparoscopy, several studies indicate that the diagnostic accuracy of HSG ranges from 5.6% to 88% (7). Standard steps of management were undertaken thereafter for all patients, which included confirmation of diagnosis of cases with uterine anomalies using other tools such as laparoscopy and hysteroscopy. This was followed by the appropriate treatment as indicated.

We excluded women who were unable to give informed consent or in the absence of any of the inclusion criteria. The objective of this study was to estimate the prevalence of uterine septum in patients with polycystic ovarian syndrome (PCOS).

## Results

The study included 172 women who sought medical advice at a fertility clinic. The average age and BMI respectively of the studied women was 24.5+/- 4.9 years and 28+/- 4. They were all originally from the Levant region. Menstrual irregularities were diagnosed in 40% of women. Menstrual irregularities included oligomenorrhea and amenorrhea. 129 women with primary infertility (75%) and the rest 43 women with secondary infertility (25%), 7 of them had history of one pregnancy ended by first trimester miscarriage and 3 had recurrent pregnancy loss < 12 weeks of gestation.

49 women were diagnosed with PCOS based on the Rotterdam ESHRE/ASRM-sponsored PCOS consensus workshop group criteria. Of the 49 women 15 (31%) were diagnosed to have uterine anomalies (Table 1).

Of the patients with uterine anomalies 11 had a uterine septum, 3 patients had an arcuate uterus and one patient had a bicornuate uterus (Table 2). The differentiation between all types of the congenital uterine anomalies was confirmed by Laparoscopy and hysteroscopy at the same operating session.

## Discussion

PCOS is a metabolic disorder with wide spectrum of presenting symptoms. Uterine septum is associated with infertility and recurrent pregnancy loss and it is associated with the poorest reproductive outcome of all uterine anomalies (8). It is thought that the poor vascularity of the septum that will provide a poor implantation site for the pregnancy (9). The presence of uterine septum is usually diagnosed later during the management of an infertile couple with PCOS as the possible cause. This is considered after a failure of fertility treatment. To achieve a reliable

diagnosis an imaging study such as hysterosalpingogram should be arranged and if a uterine anomaly is suspected; further investigations are arranged, including MRI and it is shown to be superior to hysteroscopy alone as it evaluates not only the inner cavity but the whole shape and size of the internal and external aspects of the uterus in a non-invasive manner while hysteroscopy will allow evaluation of internal part of the uterus and you cannot evaluate the outer shape of the uterus, so you will be unable to differentiate between different types of uterine anomalies for this reason it is considered inferior to MRI (Pellerito et al., 1992; Fischetti et al., 1995; Bermejo et al., 2010). Moreover MRI also can test for presence of renal anomalies in patients with uterine anomalies (Gell et al., 1998; Li et al., 2000). The gold standard method of confirming diagnosis is via endoscopy; combined laparoscopy and hysteroscopy (as neither laparoscopy nor hysteroscopy alone enable the accurate diagnosis of the anomaly type) which allows confirmation of the type of anomaly and allows treatment via hysteroscopy resection at the same surgery, this is shown to decrease the miscarriage rate from 85% down to 15% and improves the term birth rate from less than 10% to more than 20% (10,11,12,13).

In our study, 15 patients (31%) out of the 49 PCOS patients had uterine anomalies; 11 patients uterine septum (73%), 3 patients Arcuate uterus (20%) and one patient has a Bicornuate uterus (7%). Follow up of 9 from the 11 patients with uterine septum up to 9 months after septum resection (2 patients were lost the follow up), 6 patients conceived during this period either spontaneously or via Assisted reproductive techniques (pregnancy rate 67%), which indicates a surgical resection of the uterine septum will increase the pregnancy rate

significantly and it showed that mullerine duct anomaly is a significant cause of infertility in PCOS patient.

The findings in our study may encourage Infertility clinicians to arrange Uterine imaging study, such as hysterosalpingogram, in PCOS patients as a routine basic work up to test for tubal patency and more importantly to look for any uterine anomalies especially the uterine septum that carries the poorest reproductive outcome and if pregnancy conceived they have a higher risk of recurrent miscarriages (14). In addition, the results of our case series underscore the limitations of considering anovulation as the only cause of infertility in PCOS patients in presence of a normal sperm test.

Our study has limitation which include number are small, few of the recruited women were lost to follow up, therefore we were not able to comment of their fertility and obstetric outcome after diagnosis and the study population was selective including women with PCOS seeking pregnancy, therefore bias can't be excluded.

### Conclusion

To the best of our knowledge this is the first

study to investigate the prevalence of uterine septum in PCOS. The finding in our study unfortunately can't be justified scientifically, PCOS is a prevalent condition which make the coexistence of both condition by chance alone a remote possibility , but we propose that the link between PCOS and uterine anomaly mostly an a developmental defect that occurred during embryogenesis and we hope that future research studies will find the exact association between them .We support screening for uterine anomalies especially septate uterus in PCOS patients as this is useful to treat multiple infertility factors and not to delay the diagnosis and treatment of such anatomical factor that is associated with poorest reproductive outcome.

### Conflict of interest

#### No conflict of interest

1. Firas Al-Rshoud, Data collection, writing up the manuscript, No conflict of interest
2. Rami Kilani, data collection, No conflict of interest
3. Fida Al-Asali, data collection and analysis, No conflict of interest
4. Ibrahim Alsharaydeh, analysis and review, No conflict of interest

**Table 1**

Total Number PCOS (patients)	Total Number of uterine anomalies (patients)
49	15 (31%)

**Table 2**

Total number of patients with uterine anomalies 15	Uterine anomaly
11/15 (73 %)	Uterine septum
3/15 (20 %)	Arcuate uterus
1/15 (7 %)	Bicornuate uterus

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## انتشار الحاجز الرحمي في متلازمة تكيس المبايض. سلسلة من 49 حالة

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### الملخص

الهدف لتقدير مدى انتشار الحاجز الرحمي في المرضى الذين يعانون من متلازمة تكيس المبايض التي تم فحصها للعقم بعد الفشل في تحقيق الحمل مع تحريض الإباضة في منطقة عالية الإصابة ، مثل الشرق الأوسط  
التصميم: دراسة رصدية مستقبلية

الطريقة تم فحص 49 مريضاً من 172 مريضاً يطلبون نصيحة خصوبة في عيادة خصوبة متخصصة في عمان ، الأردن ، خلال الفترة من سبتمبر 2017 إلى يوليو 2018 مع وجود متلازمة تكيس المبايض لوجود تشوهات الرحم الخلقية عن طريق تصوير الرحم (HSG). تم تصنيف الشذوذ وفقاً لتصنيف جمعية الخصوبة الأمريكية. إذا تم الاشتباه في وجود شذوذ في تنظير البطن التشخيصي وتنظير الرحم لتأكيد التشخيص. تم تأكيد أن 15 مريضاً (31٪) من 49 مريضاً لديهم تشخيص مؤكّد لمتلازمة المبيض المتعدد الكيسات يعانون من تشوهات الرحم. كان لدى 11 مريضاً حاجز رحم، وثلاثة مرضى لديهم رحم مقوس ومريض واحد لديه رحم ثانٍ في القرن

الخلاصة: هناك ارتباط بين متلازمة تكيس المبايض وحاجز الرحم. تأمل هذه الدراسة في تنوير أطباء العقم حول وجود عامل الرحم في مرضى متلازمة تكيس المبايض (31٪) وال الحاجة إلى فحص هذا التشوه الخلقي في أول استشارة لهم قبل الشروع في عملية تحفيز الإباضة التي تستغرق وقتاً طويلاً ومكلفة.

**الكلمات الدالة:** متلازمة تكيس المبايض ، العقم ، الحاجز الرحمي.