

Ultrasound Evaluation of Abnormally Positioned Ovaries as a Cause of Pelvic Pain

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Abstract: ***Background:** Pelvic pain is one of the commonest symptoms in women of child bearing age. Abnormal position of the ovaries may be one of the reasons for the unexplained pelvic pain. **Objectives:** To evaluate the association between abnormal ovarian position and pelvic pain. **Materials and methods:** One thousand female patients of reproductive age group who underwent USG pelvis were included in the study. History of pelvic pain, discomfort and tenderness elicited and correlated with ovarian positions. **Results:** Out of 1000 patients, 825 (82.5%) had normally positioned ovaries. Most common abnormal position of ovaries was POD, 170(17%). Symptomatic patient counts was 236(23.6%) and 764 (76.4%) were asymptomatic. P value for correlation of abnormally positioned ovaries with pelvic pain was less than 0.0001. **Conclusions:** Abnormally positioned ovaries are common in routine USG practice. Almost 50% of patients with ovaries in POD are symptomatic.*

Keywords: Ovarian positions, pelvic pain, ultrasound of pelvis

1. Introduction

Pelvic pain is a common clinical presentation in gynecologic practice. The prevalence of chronic pelvic pain ranges between 5 and 40 percent (1,2). Various causes have been attributed to pelvic pain in women of child bearing age group and sometimes even treated as psychosomatic condition (3). Chronic pelvic pain (CPP) is a prevalent condition with a significant impact on the personal, social, professional and marital life of women. It is a complex condition that may have no specific causal diagnosis or may be associated with multiple diagnoses & frequently involving treatment failure (4,5,6). But none of the studies have evaluated abnormally placed ovaries as a causative factor. Suspended by ligaments and being moderately vascular, we hypothesize that abnormally placed ovaries may be one of the causes of pelvic pain, discomfort and tenderness in the iliac fossa. Ultrasound examination of the ovaries is a safe & non-invasive technique to locate the position of ovaries and to rule out other pelvic pathologies (7,8).

2. Anatomy

Ovaries are a paired ductless female reproductive organ situated in pelvis. Ovaries are deeply situated in the female pelvis on either side of uterus in ovarian fossa bounded by the external iliac vessels, obliterated umbilical artery and the ureter, attached to the posterior surface of the broad ligament by meso-ovarium and below the fallopian tubes. Two ligaments which anchor the ovaries are suspensory ligament of ovary (infundibular pelvic ligament) from meso-ovarium to pelvic side wall and ligament of ovary from ovary to fundus of uterus later continuing as round ligament of uterus (9,10,11).

However, the utero-ovarian ligament and the suspensory ligament of the ovary have variable degrees of laxity and

behave more like mesenteries than as tightly fixating or rigid support structures. Consequently, the actual position and the orientation of the ovaries are variable in different patients and in the same patient at different times. The potential ovarian locations include the adnexal regions lateral to the uterus, the posterior cul-de-sac, and superior or posterior to the uterine fundus. When the uterus is retroverted, either or both ovaries can be ventral and lateral to the uterus. Furthermore, the ovaries may assume unusual locations in the upper pelvis or lower abdomen, particularly in the presence of a large ovarian or extra-ovarian pelvic mass (12).

Neurovascular bundles enter the ovaries via meso-ovarium. Vascular supply is by paired ovarian arteries, branches of abdominal aorta below the renal arteries. The venous drainage is via left ovarian vein into the left renal vein and right renal vein draining directly into the inferior vena cava. Lymph from the ovaries drains into the para-aortic nodes. Ovarian nerve supply consists of sympathetic innervations by the ovarian plexus and parasympathetic innervations by the uterine plexus (13).

3. Materials and Methods

One thousand consecutive female patients of reproductive age group (16-55yrs) who underwent USG pelvis (both trans-abdominal and trans-vaginal) for various clinical indication were included in the study during April to September 2017 with relevant approval by the institutional review board. History of pelvic pain, discomfort and tenderness in the iliac fossa were elicited and correlated with ovarian positions on ultrasound.

Inclusion criteria consisted of consecutive patients who were referred to USG pelvis from other speciality departments to department of Radiology, JSS hospital. Patients outside the

specified age group and patients who have undergone previous pelvic surgeries were excluded from the study.

USG technique: Ultrasound of pelvis was done, after obtaining proper consent of the patient, by a radiologist of at least three years experience. Trans-abdominal scanning was done in full bladder for better acoustic window using curvilinear probe of 3-6MHZ probe and Trans-vaginal scanning in empty bladder using 6-10MHZ endo-vaginal probe with a low dynamic range. The equipments used were HD 11 & IU 22 of Philips make.

4. Results

Table 1: Table depicting number of patients in different age groups

		Count	Column N %
age category	<20	128	12.8%
	21-40	694	69.4%
	>40	178	17.8%
Total		1000	100

Most of the subjects belonged 21-40year age group making up almost 70 percent of the study group. Mean age of the subjects was 31.8 years with median of 32years and standard deviation of 9.1years.

Out of one thousand individuals 87 subjects had ovaries in abnormal position on right side and 95 in abnormal position on left side, majority of them were in the pouch of Doughlas. Few of them were in the retro-iliac location and superficial location. None of them were seen in the inguinal canal.

Table 2: Shows number and percentage of different ovarian positions

		Count	Column N %
Position of ovary right side	Normal Right	913	91.3%
	POD Right	84	8.4%
	Retro iliac Right	1	.1%
	Superficial right	2	.2%
	Inguinal canal	0	.0%
Position of ovary left side	Normal Left	905	90.5%
	POD Left	93	9.3%
	Retro iliac Left	1	.1%
	Superficial Left	1	.1%
	Inguinal canal	0	.0%



Figure 1: Trans-vaginal USG image with left ovary in POD.

Table 3: Table depicting the counts and percentages of position of ovaries on both sides

	Count	Column N %
Both Normal	825	82.50%
Rt POD	77	7.70%
Rt RIV	1	0.10%
Rt SL	2	0.20%
Lt POD	86	8.60%
Both POD	7	0.70%
Lt RIV	1	0.10%
Lt SL	1	0.10%

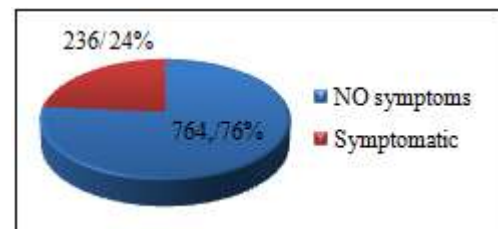


Figure 2: Pie chart representing counts and percentages of symptomatic V/S asymptomatic patients.

Out of the 1000 subjects involved in the study 236 patients i.e., 23.6% were symptomatic and 764 patients were asymptomatic.

Totally 236 patients were symptomatic and out of which 45 patients had abnormally positioned ovaries on right side and 53 patients had abnormally positioned ovaries on left side. Symptomatic patients constituted more than 50% of subjects with abnormally positioned ovaries with P value of <0.0001 whereas only 20-21% of subjects with normally positioned ovaries had symptoms.

Twenty one percent of patients with normally positioned ovaries on right side had symptoms, whereas it jumped to 50% when the ovaries were in POD. All the patients i.e.,

100% of patients with retro-iliac ovaries and superficially located ovaries on right side had symptoms. Twenty percent of patients with normally positioned ovaries on left side had symptoms, whereas it went up to 55% when the ovaries were in POD. All the patients i.e., 100% of patients with retro-iliac ovaries and superficially located ovaries on left side also had symptoms.

abnormally positioned ovaries and symptoms was <0.0001, suggesting excellent association.

Hence it is safe to state that abnormally positioned ovaries are one of the important factors to be considered while treating patient with pelvic pain, pelvic discomfort & dysmenorrhea.

Table 4: Symptom v/s position of ovary

		SYMPTOMATIC				p
		NO		YES		
		Count	%	Count	%	
Position of ovary right side	Normal Right	722	79.1	191	20.9	<0.0001
	POD Right	42	50	42	50	
	Retro ileac vessel Right	0	0	1	100	
	Superficial location Right	0	0	2	100	
	Inguinal canal right	0	0	0	0	
Position of ovary left side	Normal Left	722	79.8	183	20.2	<0.0001
	POD Left	42	45.2	51	54.8	
	Retro ileac vessel Left	0	0	1	100	
	Superficial location Left	0	0	1	100	
	Inguinal canal left	0	0	0	0	

5. Discussion

Our study on 1000 patients, who were referred for routine pelvic scanning, gives an overview of various anatomical positions of the ovary in female pelvis. As much as 17.5% of the patients had ovaries in abnormal positions. Out of 1000 patients only 825 had normally positioned ovaries, bilaterally. On right side 913 patients had normally positioned ovaries, whereas on left side it was 905 patients.

Most common position for abnormally positioned ovaries in our study was POD. We encountered 84 (8.4%) of ovaries in POD on right side and 93(9.3%) ovaries on left side. Superficial location of ovaries noted in 2 cases on right side and 1 case on left side. On either side one case each were found to be having ovaries in retro-iliac position.

Pelvic pain, pelvic discomfort & dysmenorrhea were seen in 236(23.6%) of the patients. While 734 patients had no such symptoms. Out of 825 patients with normally position ovaries 683 (82.8%) of the patient had no symptoms while 142 (17.2%) of the patients complained of at least one symptom mentioned above.

On right side 77 patients had ovaries on right side out of which 39(50.6%) were asymptomatic, while 38(49.4%) had symptoms. Similarly on left side 86 patients had ovaries in POD out of which 39(45.3%) were asymptomatic and 47(54.7%) had symptoms. All the patients (100%) with ovaries in the retro-iliac and superficial locations had symptoms. The P value for correlation of patients with

6. Conclusion

Abnormally positioned ovaries are quiet common in routine ultrasound practice. There is significant association between pelvic pain and abnormally positioned ovaries. It is important to mention the position of ovaries in ultrasonography reports to help the treating physician in arriving at suitable line of management.

7. Future Scope

Being a pioneering exploratory study, the findings do not enjoy the benefit of comparative analysis. Multi-centric targeted study is required to validate the findings of the current study.

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