

# UTERINE SONOMORPHOLOGY OF ASHERMAN SYNDROME ON TRANSVAGINAL ULTRASOUND

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## ABSTRACT:

**Objective:** To determine the accuracy of transvaginal ultrasound in evaluation of uterine sonomorphology in nongestational amenorrhoea following curettage procedures (Asherman Syndrome)

**Design:** Observational study

**Place and duration:** Multi-centric study from June 2001 to December 2004

**Patients and Methods:** The study population comprised all adult females in reproductive age group who presented with amenorrhoea following a curettage procedure. Those with positive serum BHCG, and raised serum prolactin were excluded. Transabdominal (TAS) as well as transvaginal ultrasound (TVS) scan was carried out in all patients. Hysterosalpingography (HSG) was done in nearly all patients. Age, parity, indication for referral and curettage, duration of amenorrhoea, frequency of curettage and previous menstrual and obstetric history, were obtained. Transvaginal scan findings were recorded and compared with HSG. Two patients came for a follow up after adhesionolysis.

**Results:** There were 17 subjects in all with a mean age of 28.6 years, mean parity of 4.5 and mean amenorrhoea duration of 5.5 months. Sixteen were primarily referred for evaluation of amenorrhoea. Twelve had history of previous pelvic infection, 8 had previous menstrual irregularity and 15 had abortions. Repeat curettage was done in 09 patients. Trans abdominal ultrasound was positive in only one patient and transvaginal ultrasound was positive in all cases. Findings on the later examination included normal to thickened endometrium with heterogeneous echo texture, irregular outline, non-shadowing echogenic foci and sparse sub-endometrial vascularity. Calcification at endo-/myometrium junction was seen in one case on both techniques. The sensitivity of TVUS in diagnosing intra uterine adhesions was 92%, specificity 100%, positive predictive value 100% and negative predictive value 92%.

**Conclusion:** Trans vaginal ultrasound shows accurate and specific uterine sonomorphologic features in traumatic amenorrhoea and can be used as a reliable screening test.

**KEY WORDS:** Asherman syndrome, amenorrhoea, curettage, intrauterine adhesions, endometrium, trans-vaginal ultrasound.

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## INTRODUCTION

Intrauterine adhesions and synechiae resulting from trauma, commonly curettage, is called Asherman syndrome<sup>1</sup>. It may also result from other uterine interventions such as caesarian section and myomectomy, rarely from genital infections such as chlamydia, tuberculosis, and schistosomiasis<sup>2</sup> and even the presence of a foreign body. It usually leads to amenorrhoea, hypomenorrhoea, habitual abortion and secondary infertility. It is also called Fritsch-

Asherman syndrome and the earliest descriptions date back to a single case description by the Austrian gynecologist Ernest Werthien (1864-1920) <sup>1</sup>.

Generally regarded to be an uncommon finding <sup>3</sup>, the prevalence following secondary removal of placental remnants or repeat curettage may be as high as 40% <sup>4</sup>. Otherwise the estimated occurrence is 1:100 post partum curettage procedures <sup>5</sup>. It can strike any woman undergoing virtually any intrauterine procedure. The condition is under diagnosed due to non-visualization of cavity on hysterosalpingography (HSG), which is the usual method of evaluation <sup>3,4</sup>. However endovaginal ultrasound has unique characteristics, which allow its utilization in the evaluation of this equally unique mucous membrane that lines the uterine cavity and correct evaluation of severity of adhesions helps in predicting the response to therapy. <sup>6,7</sup>

The objective of this study was to determine the accuracy of transvaginal ultrasound scanning (TVS) in evaluating the morphology of endo and myometrium in cases of Asherman syndrome following curettage.

## PATIENTS AND METHODS

This multi-centric observational study included seventeen cases seen over a three and a half years period (June 2001 to December 2004) in three different hospitals of Karachi, the Aga Khan University Hospital, Civil Hospital and Delhi Mercantile Medical Center.

**Inclusion and Exclusion Criteria:** Adult married female with history of amenorrhea of more than 2 months duration following a curettage procedure, referred for an ultrasound evaluation were included. Those with raised B-HCG, visible gestational sac on ultrasound, raised serum prolactin levels or not consenting for endovaginal scanning were excluded. Scanning was done per abdomen and vaginum. Age, duration of amenorrhea, indication of curettage and then referral, number of times curettage was performed, and past menstrual and obstetric history as well as uterine appear-

ance in terms of endometrial thickness, regularity, echotexture and vascularity were noted. Doppler ultrasound was performed in only seven cases, which did not belong to CHK.

HSG was done in all cases except one and was taken as the gold standard against which the sensitivity, specificity, positive and negative predictive values were determined. Only two patients came for follow up after 6 months.

## RESULTS

There were a total of 17 patients. Out of them 16(92%) were referred for evaluation of non gestational amenorrhea and 1 (8%) for base line evaluation of prior to home one replacement therapy. Mean age was 28.6 years (range 23-48); mean parity was 4.5 (range 0-7) and mean duration of amenorrhea prior to scanning was 5.5 months (range 3-37 months). Indication for last curettage was retained products of conception in 15 (88%) and with full abortion to 1402 (12%). Curettage was done once in 8 patients (48%) and two or more times in 9 (52%). History of pelvic infection was present in 12 patients (70.5%); history of abortion was available in 15 (88%) patients including two willful abortions while 07 (47 %) had previous menstrual irregularity.

Trans abdominal scan was normal in 16 patients with only one patient showing positive finding of extensive irregularly arranged sub endometrial calcifications. TVS was positive in all 17 patients which included normal to thickened endometrium, heterogeneous echogenicity, irregular outline, sparse sub-en-

Table-I: Sonographic endometrial characteristics in intrauterine adhesions

<i>Findings</i>	<i>No. of patients</i>	<i>%</i>
Endometrial thickness		
2-4 mm	08	48
5-8 mm	09	52
Heterogenous echotexture	16	92
Irregular outline	16	92
Sparse endometrial vascularity	06	35.2
Calcification at endometrial/ myometrial junction	01	5.8

ometrial vascularity and discrete regularly arranged calcifications at endometrium/ myometrium junction (Table-I)

Sensitivity of TVS was 92%, specificity 100% and PPV was also 100%. Distal extent of changes correlated well with the proximal extent of cavity seen on HSG.

Two patients came for follow up after 06 months following hysteroscopic adhesionolysis and IUCD insertion. Both showed normal layered endometrium with multifocal vascularity.

## DISCUSSION

The results of this study show that uterine cavity hidden by adhesions on HSG, is adequately visualized on TVUS giving a fairly accurate idea of the extent of endometrial abnormality. This data is unique in the sense that local data is sparse on this topic. Hysteroscopy and hysterosalpingography are the usual diagnostic modalities for this condition<sup>6-8</sup>. While hysteroscopy is invasive, HSG causes significantly more pain in amenorrhic than in menstruating women.<sup>9</sup> It is also reported that the presence of calcified or ossified tissue in endometrium can go undetected on HSG as well as MR while it can be visualized by TVUS.<sup>10</sup> It is therefore logical to utilize trans vaginal ultrasound as a modality of choice that may alert the gynecologist to the possibility of intra uterine synechiae.<sup>11</sup>

The data extracted in this series highlights some important comparative aspects. There was history of infection before or after procedure in majority of these patients as was the history of abortion. This coincides with Westerndrop et al. who had pointed to a mildly increased risk in such cases<sup>4</sup>. The same researchers have also found a significant (12 – fold) increased risk of acquiring Asherman syndrome in women with previous menstrual irregularities. Eight of our 17 patients also had menstrual cycle and volume irregularities in the past. Just over half of these patients were repeatedly curettaged. Repeat curettage or secondary removal of products of conception/ placental remnants can increase the prevalence

of intra uterine adhesions up to 40%.<sup>4</sup>

Endovaginal ultrasound is often superior to transabdominal ultrasound in evaluation of endometrial abnormality.<sup>12,13</sup> This is again demonstrated in this study where transabdominal ultrasound could detect only gross calcifications while TVUS could detect subtle endometrial changes. Other researchers also note these changes of endometrial thickness, altered echogenicity and irregularity. Mendelson et al. associated these changes with Asherman syndrome apart from early pregnancy, decidual reaction, endometrial carcinoma, and reaction to intra-uterine contraceptive device.<sup>12</sup> Cofino et al. also recommend ultrasound for evaluation and follow up of intra uterine adhesions.<sup>11</sup> They described the adhesions as dense intrauterine lines, which disappeared after adhesionolysis. Only two patients in our series came for follow up after adhesionolysis. Both of them showed normal layered pattern of endometrium with increased sub-endometrial vascularity than before. It must be stressed that the vascularity changes as seen in this study are not described in literature previously.

The extent of adhesion formation correlated with the HSG findings. The extent of adhesions determines the severity, grading (from I-IV on an ascending scale) and outcome.<sup>4</sup> Patients in whom fundus is completely obscured or those with narrowed fibrotic cavity are therapeutically more challenging than mild endometrial type adhesions.<sup>6</sup> These adhesions are persistent and may deform a pregnancy sac.<sup>14</sup> However milder type may even resolve spontaneously after 8 months<sup>15</sup> which may be the probable reason of some patients being lost to follow up as a majority (58%) of our patients had amenorrhea of less than twelve months duration. Recently a bio absorbable membrane of chemically modified hyaluronic acid and carboxy methyl cellulose-by the name of Seprafilm, is introduced for intrauterine placement to prevent or reduce the post-operative endometrial and endo cervical synechiae formation.<sup>16</sup> It has shown considerable safety and efficacy in this regard with improved possibility of new pregnancy and fertility. However

whether it can replace the current gold standard of hysteroscopic lysis remains to be seen.

The high sensitivity, specificity and PPV of TVUS in our series is comparable to that with Fedele et al.<sup>17</sup> who found a sensitivity of 91% with equal specificity and PPV i.e. 100% as ours. The superiority of transvaginal ultrasound also corresponds with Mendelson et al. observation of transvaginal scan having superior image quality over transabdominal scan.<sup>12</sup>

**Limitations of the study:** The main limitations of our study were small number of patients, even smaller number available for follow up, Doppler evaluation in smaller proportion of the cases, operator dependent technique and those inherent with all observational studies i.e. inability to prove or disprove a hypothesis. The main strengths are provision of a local database in a rapidly establishing diagnostic test (the transvaginal sonography) and description of a condition, which remains under diagnosed due to under estimation of diagnostic features. An appreciation of the diagnostic potential of an ingenious technique may lead to better diagnostic and therefore management and preventive options.

## CONCLUSION

Transvaginal ultrasound is a noninvasive, specific and sensitive imaging technique that detects subtle endometrial abnormalities caused by intra uterine adhesions following a curettage procedure. It can be used as an adjunct to hysterosalpingography for evaluation of the extent of adhesions.

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