

## Association of Endometrial Thickness with Premenopausal Endometrioid Endometrial Cancer and Atypical Hyperplasia and Correlation to Patient and Disease Characteristics

Jessica Grubman, MD, MAS,<sup>1,5</sup> May Nguyen, BS,<sup>2</sup> Vanessa Mora, BS,<sup>2</sup> Nicholas Ladwig, MD,<sup>3</sup> Vanessa Jacoby, MD, MAS<sup>1</sup>, Lee-may Chen, MD<sup>4</sup>

---

<sup>1</sup>Division of Obstetrics, Gynecology, and Gynecologic Subspecialties, Department of Obstetrics, Gynecology, and Reproductive Sciences, University of California San Francisco

<sup>2</sup> University of California San Francisco School of Medicine

<sup>3</sup>Division of Surgical Pathology, Department of Pathology and Laboratory Medicine, University of California San Francisco

<sup>4</sup> Division of Gynecologic Oncology, Department of Obstetrics, Gynecology, and Reproductive Sciences, University of California San Francisco

<sup>5</sup>Division of Gynecology, Department of Obstetrics and Gynecology, University of Texas Southwestern Medical Center

**Objectives:** The purpose of this study is to evaluate endometrial thickness on ultrasound prior to diagnosis of premenopausal endometrioid endometrial cancer and atypical hyperplasia and to analyze its association with patient and disease characteristics.

**Methods:** This was a cross-sectional study of premenopausal patients treated at a single institution for atypical endometrial hyperplasia or endometrioid endometrial cancer from 2015-2020. We evaluated endometrial thickness (EMT) in millimeters (mm) on ultrasounds done prior to malignancy diagnosis, and investigated the association of EMT with age, body mass index (BMI), years of abnormal uterine bleeding (AUB), blood transfusion for AUB-related anemia, nulligravidity, and diabetes through multivariable linear regression. We also analyzed mean EMT by disease grade and stage with one-way analysis of variance (ANOVA) models. Statistics were performed in Stata.<sup>1</sup>

**Results:** Of 30 patients with atypical hyperplasia and 122 with endometrial cancer, 110 (72.4%) had an EMT reported. Average EMT for all cases was 20.8mm (range 3-90). Mean EMT was 16.7mm for atypical hyperplasia, compared to 21.5mm for grade 1 cancer and 22.6mm grade 2 or higher; and 21.4mm for stage IA or clinical stage I cancer versus 22.8mm for stage IB or higher. The difference in mean EMT was not significant between disease grade ( $p=0.26$ ) but reached statistical significance between stages ( $p<0.01$ ). In multivariable linear regression, BMI significantly correlated to increased EMT, with every 1-unit increase in BMI increasing EMT by 0.3mm. Longer duration of AUB and age trended toward decreased EMT and anovulation, diabetes, nulligravidity and transfusion toward increased, though these did not reach statistical significance (Table 1).

**Conclusions:** Endometrial thickness positively correlates to BMI in premenopausal patients and appears to correlate with disease stage and grade, and may be useful in risk evaluation. Longer duration of AUB prior to malignancy diagnosis decreased endometrial thickness, which may relate to disease process. Other patient characteristics such as blood transfusion and diabetes may impact endometrial thickness ( $p<0.2$ ). However, our sample was small due to the relative infrequency of premenopausal endometrial malignancy, which limited statistical power, and we did not find statistically significant associations between these.

**Table 1. Association of Patient Characteristics with Endometrial Thickness (mm)**

<b>Characteristic</b>	<b>Correlation Coefficient (95% CI)</b>	<b>p-value</b>
Age at malignancy diagnosis	-0.16 (-0.61 – 0.29)	0.49
BMI at malignancy diagnosis	0.3 (0.09 – 0.51)	<0.01
AUB duration [Equation]1 year	-4.38 (-9.41 – 0.64)	0.09
Transfusion for AUB-related anemia	3.92 (-1.99 – 9.84)	0.19
Diabetes	3.53 (-1.57 – 8.83)	0.17
Nulligravity	1.32 (-3.09 – 5.74)	0.59

**References:**

1. StataCorp. 2021. Stata Statistical Software: Release 17. College Station, TX: StataCorp LLC.