The additive effect of previous cesarean delivery on cesarean defect location and associated anatomical changes

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Objective: To describe the effects of each additional cesarean section (CS) on cervical-defect distance (DD), defect size, uterine position and uterine flexion.

Methods: A prospective analysis of scans of 469 women who were referred for IUD localization between 2012 and 2014. Transvaginal images were assessed for uterine position, uterine flexion angle, defect size and location. The sonologist who read the images were blinded to patients’ surgical history. CS defect location was determined by 2 measurements: 1) DD = Defect Distance from the external cervical os; 2) DDR = Defect Distance Ratio - defined as DD/ Uterine length. Women with no prior CS were compared to those with history of 1, 2, and more CS. Statistics including logistic regression was used as indicated.

Results: Of 469 patients, 308 (65.7%) had 0, 103 (22.0%) had one, 44 (9.4%) had two and 14 (3.0%) had ≥3 CSs. Groups were similar in age, BMI, presence of fibroids. Number of CS’s was associated with a higher percentage of retroverted uteri and mean retroflexion angle. (1.3%, 5.8%, 4.5%, and 7.1% with 0, 1, 2, and ≥3 CSs respectively, p=0.004 AND mean angle -20.0, 9.1, 27.1, and 38.5 with 0, 1, 2, and ≥3 CSs respectively, p<0.0001).

Means of DD and DDR positively correlated with number of CSs (For DD: 2.7cm with 1, 3.2cm with 2, and 3.5cm with ≥3 CSs, p=0.008 and for DDR: 0.33 with 1, 0.38 with 2 and 0.41 with ≥3 CSs , p= 0.007, respectively).

The rate of prominent niche increased with increasing number of prior CS’s (55.4%, 68.2%, and 78.6% with 1, 2, and ≥3 CSs respectively, p=0.03).

Compared to patients with 1 prior CS, patients with 2 CSs have 2.3 times the odds of having prominent niche. (95% CI: 1.2, 4.5 p=0.01).

Model of logistic and linear regression showed Patients with 1 CS have a retroflexion angle that is on average 29 degrees greater than patients with no prior CS (95% CI: 20.27-37.86, p<0.0001).

Conclusions:

• With increase of the number of CS, there was significant increase in uterine retroversion, retroflexion, defect size, and defect distance from the external cervical os.

• The impact of the CS defect size and location on placentaion warrants further studies.
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Hi Ohad, Here are the sentences you can use describing the linear and logistic regression model results:

Compared to patients with 1 cesarean section, patients with 2 CSs have 2.3 (95% CI: 1.2 - 4.5, p=0.01) times the odds of having a prominent niche. Compared to patients with 1 cesarean section, patients with 3+ CSs have 1.9 (95% CI: 0.7 - 5.3, p=0.24, non-significant) times the odds of having a prominent niche.

Patients with 2 CSs have a DD that is on average 0.43 (95% CI: 0.07 - 0.79, p=0.02) cm longer than patients with 1 CS. Patients with 3+ CSs have a DD that is on average 0.72 (95% CI: 0.15 - 1.29, p=0.01) cm longer than patients with 1 CS.

Patients with 2 CSs have a DDR that is on average 0.04 (95% CI: 0.01 - 0.08, p=0.02) greater than patients with 1 CS. Patients with 3+ CSs have a DDR that is on average 0.08 (95% CI: 0.02 - 0.14, p=0.01) greater than patients with 1 CS.
Compared to patients with 1 cesarean section, patients with 2 CSs have 1.5 (95% CI: 0.7 - 3.1, p=0.32, non-significant) times the odds of having a DDR above the median. Compared to patients with 1 cesarean section, patients with 3+ CSs have 3.4 (95% CI: 1.1 - 10.7, p=0.04) times the odds of having a DDR above the median.

Patients with 1 CS have a retro-flexion angle that is on average 29.07 (95% CI: 20.27 - 37.86, p<0.0001) degrees greater than patients with no history of CS. Patients with 2 CSs have a retro-flexion angle that is on average 47.13 (95% CI: 34.68 - 59.58, p<0.0001) degrees greater than patients with no history of CS. Patients with 3+ CSs have a retro-flexion angle that is on average 58.52 (95% CI: 37.42 - 79.63, p<0.0001) degrees greater than patients with no history of CS.
Increased rate of uterine retroflexion in women with history of a previous caesarean delivery

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Objective: To compare the uterine position and Cervico-Uterine Angle (CUA) between women who underwent cesarean delivery (CD) and those who did not.

Methods: Retrospective analysis of 303 women referred for sonographic evaluation of their IUD localization between 2012-2014. Using transvaginal sonography (Fig 1) in a sagittal view, we classified the uterine position as Anteverted (AV), Retroverted (RV) or Axial.

CUA was measured and defined as Anteflexed (AF) if <0°, Retroflexed (RF) if >0° or Nonflexed (NF) if=0° (Fig 1). Patients CUA’s were compared between those who had prior cesarean delivery and those who did not. P<0.05 was considered significant.

Results: 105 women had a history of CD and 198 women did not. The groups were similar for age, BMI and presence of fibroids. AV was the most common position in both groups (85.6% in patients with CD and 82.6% in patients without). However, women with prior CD had more Axial and less RV uterine positions as compared to women without (7.2% and 7.2% vs 2.6% and 14.7%, p=0.04).

Women with prior CD had significantly higher rate of RF angle (51% vs 19%, p<0.0001). Most women (72.7%) with no history of prior CD had AV/NF uteri (112/191). In contrary, in the group with prior CD, women with prior CD had significantly higher rate of RF angle (51% vs 19%, p<0.0001). Most women (72.7%) with no history of prior CD had AV/NF uteri (112/191). In contrary, in the group with prior CD, women with prior CD had significantly higher rate of RF angle (51% vs 19%, p<0.0001).

Conclusions:
1. Women with prior CD have higher rate of retroflexed uteri.
2. The retroflexion is positively associated with number of CD’s.
3. It is possible that changes in tissue properties at the CD scar area might lead to a significant change in the CUA.