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# Prediction and Correlation of Presence and Severity of Intra-Abdominal Adhesions before Caesarean Delivery, a Prospective Study

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## I. Background:

The primary cesarean delivery rate rose in the last decade, and the percentage of women undergoing vaginal birth after cesarean delivery declined remarkably. A new study based on the data from the National Family and Health Survey has shown that there is a significant increase in the rate of cesarean births in India. While the WHO recommends the rate of cesarean delivery to be 10-15%, the number was 17.2% for India during the period from Jan 2017 to Dec 2018[1]. Cesarean delivery is considered a risk factor for abdominal adhesion formation. Adhesions, which are abnormal bonds between the surfaces of anatomical structures, can present with varying severity after repeated intra-abdominal or pelvic surgeries.adhesion-related complications after cesarean delivery include bowel obstruction, chronic pelvic pain, infertility, and difficult and sometimes complicated repeat surgery[2]. Because the abdominal scar of a previous laparotomy and intra-abdominal adhesions are both tissue healing processes[3], our aim in this study is to investigate whether specific abdominal scar characteristics found preoperatively could predict the presence and severity of intra-abdominal adhesions formed after a previous cesarean delivery.

## II. Objectives:

1. To study the abdominal skin scar characteristics
2. To predict and correlate the presence and severity of the intra-abdominal adhesions with abdominal scar characteristics.

## III. Methodology:

Study Design: Hospital-based prospective study
Study Area: Antenatal ward, Government Maternity Hospital.
Study subjects:100 women who underwent repeat caesarean delivery.

To examine the relationship of abdominal scar characteristics from a prior cesarean delivery with the incidence and severity of intra-abdominal adhesions, we designed a prospective cohort study of women undergoing repeat cesarean delivery at the Department of Obstetrics and Gynecology, Government Maternity Hospital, Sri VenkateswaraRamnarainRuia Government General Hospital, a teaching hospital. Pregnant women with at least one cesarean delivery who were delivered abdominally near term by elective repeat caesarean delivery were allocated to the study group. Abdominal scars that were studied preoperative with a scoring system including color, texture, contour, appearance etc., and recorded. The severity of adhesions by completing an adhesion score sheet immediately after performing the surgery. The adhesion score sheet data included a description of the site and the severity of the adhesions. The severity of the adhesions was defined as light filmy or dense vascular adhesions. Parameters studied included maternal age, body mass index (BMI), previous abdominal operations, gestational age at birth, parity, number of previous cesarean deliveries, and length of time since the last cesarean delivery, and postoperative complications. Patients were included irrespective of the place of their prior surgery performed.

**STATISTICAL ANALYSIS:**

Data analysis was performed using the SPSS 14 statistical package. The association between type of adhesions and other categorical variables was examined using the chi-square test. Continuous variables were analyzed by *t*-test or Mann-Whitney test when appropriate. A *P* value of <0.05 was considered significant.

**INCLUSION CRITERIA:**

1. All women with atleast one previous caesarean delivery
2. Women with repeat caesarean delivery on an elective basis
3. Women who have given consent.

**EXCLUSION CRITERIA:**

1. Women with repeat caesarean delivery on an emergency basis
2. All women who are not willing for the study.

## IV. Results:

Out of 100 women, 63 women had adhesions intra-operatively, while 37 women did not have any adhesions.

**Table 1:** Table showing the baseline data parameters with adhesions and its p-value.

| PARAMETERS | WITH ADHESIONS (n=63) | WITHOUT ADHESIONS (n=37) | P VALUE |
|---|---|---|---|
| Age, years | 22.3±5.1 | 23.1±5.5 | 0.18 |
| Body mass index, kg/m2 | 24.1±4.4 | 22.1±4.9 | 0.5 |
| No of previous Cesarean | 1.3±1 | 1±0.4 | 0.01 |
| No of previous Laparotomy | 0.1±0.3 | 0.1±0.4 | 0.5 |
| Time since last operation, years | 1.8±3.3 | 2.3±3 | 0.06 |
| Post operative complications | 3.2±0.2 | 2.8±0.4 | 0.32 |
| Hemoglobin, g/dL | 8.2±1.5 | 8.4±1 | 0.4 |

The above table shows that in the prediction of intra abdominal adhesions, baseline parameters like Age (p=0.18) , BMI (0.5), Post operative complications (0.32), Haemoglobin %(0.4)have no statistical significance while Previous number of caesarean deliveries (p=0.01) and the time since last operation (p=0.06) have statistical significance.

**TABLE 2:** Table showing the comparison between abdominal skin parameters with and without adhesions and severity of adhesions

| | ADHESIONS(63) | SEVERITY OF ADHESIONS | NO ADHESIONS(37) | P-value |
|---|---|---|---|---|
| **Color** | | | | **0.462** |
| Perfect | 21(33.3) | A-10(41.61) | 19(51.35) | |
| | | B-11(52.38) | | |
| | | C-0 | | |
| Slight mismatch | 13(20.6) | A-8(61.53) | 15(40.54) | |
| | | B-4(30.76) | | |
| | | C-1(7.69) | | |
| Obvious mismatch | 16(25.3) | A-10(62.5) | 3(8.10) | |
| | | B-4(25) | | |
| | | C-212.50 | | |
| Grossmismatch | 13(20.6) | A-7(53.84) | 0 | |
| | | B-4(30.76) | | |
| | | C-2(15.38) | | |

| | | | | |
|---|---|---|---|---|
| **APPEARANCE** | | | | **0.477** |
| Matte | 47(74.6) | A-29(61.7) | 31(83.78) | |
| | | B-16(34.04) | | |
| | | C-2(4.25) | | |
| Shiny | 16(25.3) | A-8(50) | 6(16.21) | |
| | | B-6(37.5) | | |
| | | C-1(6.25) | | |
| **CONTOUR** | | | | **0.473** |
| Flushwithsurroundingskin | 25(39.68) | A-18(72) | 23(58.97) | |
| | | B-6(24) | | |
| | | C-1(4) | | |
| SlightlyIndented | 27(42.88) | A-19(70.37) | 11(29.72) | |
| | | B-8(29.62) | | |
| | | C-0 | | |
| Hypertrophic | 9(14.28) | A-4(44.44) | 3(8.10) | |
| | | B-4(44.44) | | |
| | | C-1(11.11) | | |
| Keloid | 2(3.17) | A-0 | 0 | |
| | | B-1(50) | | |
| | | C-1(50) | | |
| **DISTORTION** | | | | **0.414** |
| None | 16(25.3) | A-12(75) | 29(78.37) | |
| | | B-4(25) | | |
| | | C-0 | | |
| Mild | 27(42.85) | A-20(74.07) | 5(13.51) | |
| | | B-5(18.51) | | |
| | | C-2(7.4) | | |
| Moderate | 19(30.15) | A-15(78.94) | 3(8.37) | |
| | | B-4(21.05) | | |
| | | C-1(5.26) | | |
| Severe | 1(1.58) | A-0 | 0 | |
| | | B-1(100) | | |
| | | C-0 | | |

| | | | | |
|---|---|---|---|---|
| **TEXTURE** | | | | **0.421** |
| Normal | 21(33.3) | A-16(76.19) | 27(72.9) | |
| | | B-4(19.04) | | |
| | | C-1(4.76) | | |
| Just Palpable | 24(53.14) | A-23(95.64) | 7(18.91) | |
| | | B-1(4.41) | | |
| | | C-0 | | |
| Firm | 5(11.4) | A-360.00 | 3(9.02) | |
| | | B-240.00 | | |
| | | C-0 | | |
| Hard | 3(4.1) | A-0 | 0 | |
| | | B-266.66 | | |
| | | C-133.33 | | |

The above table shows that the abdominal scar parameters like colour (p=0.46), appearance (p=0.47), contour (p=0.47) and distortion (p=0.414) have no statistical significance while texture of the scar (p=0.06) has statistical significance.

## V. Conclusion :

The severity of surgery-related adhesions cannot be predicted accurately based on abdominal scar characteristics inspite of many available scoring methods. Hence, unnecessary use of caesarean approach should be avoided rather than prediction of adhesions.

Keywords: adhesions, caesarean delivery

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