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SONOGRAPHIC PREDICTION OF SCAR DEHISCENCE IN WOMEN WITH PREVIOUS CAESAREAN SECTION.

Radiodiagnosis

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ABSTRACT

Objectives: This present study was to evaluate the sonographic prediction of lower uterine segment (LUS) thickness in terms scar dehiscence in previous caesarean section women. **Methods:** Detail previous delivery history, clinical examinations and relevant investigations were performed to all previous caesarean section women. Singleton term pregnancy with previous one LSCS was included. 50 women with history of previous one LSCS was measured for scar thickness by transabdominal ultrasonography. **Results:** Majorities of the cases 24(48%) were belonged in age group of 26-35 years. Most of the cases 40(80%) had normal weight (BMI=18.5-24.9 Kg/m2). 6(12%). Gravida 2 cases 34(68%) were common. 15(30%) had undergone LSCS due to PIH with failure of induction with NPOL. Most of the patients 27(54%) had inter-delivery interval ranges had 18-36 months. Majorities of the cases 27(54%) had 3.6 mm-5 mm scar thickness. Out of 27(54%) cases in delivery interval 18-36 months, 19(70.37%) cases had grade I thickness of LUS. In duration of delivery interval greater than 36 months 20(40%) cases, 11(55%) cases had grade I LUS thickness. In delivery interval less than 18 months cases 3(6%), 1(33.33%) cases had grade I, grade II and grade III LUS thickness. **Conclusions:** Sonographic measurement of thickness of LUS and myometrium is an excellent method for safely predicting the risk of scar dehiscence/rupture in women with previous caesarean section. Sonography plays an important role in monitoring the uterine defect and documenting any changes in lower uterine segment (LUS).

KEYWORDS

Previous caesarean section women, Age group, Sonographic prediction, Lower uterine segment.

INTRODUCTION

Ultrasound estimation of lower uterine segment A (LUS) provides a fairly simple and non-invasive method for prediction of scar dehiscence/rupture. The successful outcome of TOLAC depends on scar of previous CS, which is directly related to its thickness [1]. Evaluation of thickness of LUS has been found to be a potential factor for predicting scar dehiscence [2]. The risk of scar dehiscence/rupture has been directly related to the thinning of LUS [3].

The method currently used to predict CS scar rupture is ultrasonographic measurement of the thickness of the lower uterine segment (LUS) in gestational week 36–38 as pioneered by Rozenberg et al. in 1996 [3].

Cesarean section (CS) is the most common operation in obstetrics, with increasing incidence in most countries. As a result of this operation, late scar dehiscence may occur, which may lead to uterine rupture in a subsequent pregnancy [4]. Wound dehiscence and wound evisceration are serious complications, being associated with maternal mortality rates of 12 and 30% of, respectively [5]. Cesarean scar defects have long been recognized in hysterosalpingograms as anterior out-pouching [6]. As non-invasive alternative procedures, MRI and computed tomography can also be diagnostic [7].

Objectives of our study was to evaluate the diagnostic accuracy of sonographic measurements of the Lower Uterine Segment (LUS) thickness near term in predicting uterine scar defects and to ascertain the best cut-off values for predicting uterine rupture in women with previous Caesarean Section (CS).

MATERIALS & METHODS

This present study was conducted in Department of Obstetrics and Gynaecology, ANMCH, Gaya, Bihar, India during a period from January 2020 to July 2020. Attendants of entire subject signed an informed consent approved by institutional ethical committee of ANMCH was sought.

50 women with history of previous one LSCS was measured for scar thickness by transabdominal ultrasonography (USG Curvilinear Probe 3-5 Mhz).

The findings at caesarean section were classified into 4 grades as described by Qureshi et al [8]. Ultrasound scar thickness and findings at caesarean section were correlated.

Inclusion Criteria- Singleton term pregnancy with previous one LSCS.

Exclusion Criteria- Multiple pregnancy, placenta previa, previous classical caesarean section/hysterotomy and previous uterine surgery other than CS.

The LUS was graded as follows (Qureshi et al [8]) -
Grade I - LUS was well developed.
Grade II- LUS was thin without visible content.
Grade III - LUS was translucent with visible content.
Grade IV - LUS had well-circumscribed defects, either dehiscence or rupture.

Procedures: Transabdominal sonography was carried out with a full bladder (to the extent that the patient had the urge to void). The LUS was examined longitudinally and transversely to identify any areas of obvious dehiscence or rupture. Any balloon effect as described by Michaels et al consisting of any abnormal bulging of the outer layer associated with foetal movement or changes in amniotic fluid pressure against the urinary bladder base was noted.

The thinnest zone of the lower segment was identified at the mid sagittal plane along the cervical canal. This area was magnified to the extent that any slight movement of the caliper would produce a change in measurement by only 0.1 mm.

The measurement was taken with the cursors at the urinary bladder wall - myometrium interface and the myometrium/chorioamniotic membrane, amniotic fluid interface. At least, 2 measurements were made and the lowest value was taken as the LUS thickness.

During caesarean section, surgeon was performed an objective evaluation of the integrity and thickness of the LUS as described by Qureshi et al [8].

STATISTICAL ANALYSIS

Data was analysed by using simple statistical methods with the help of MS-Office software. Data was tabulated and percentages were calculated.

OBSERVATIONS & RESULTS

A total of 50 pregnant women with age group 20 to >35 years were enrolled in this study. Majorities of the cases 24(48%) were belonged in age group of 26-35 years. 20(40%) cases were in age group of 20 to 25 years.

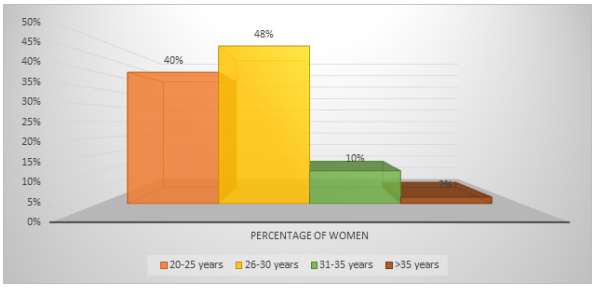


Figure.1. Age wise distributions of previous CS women.

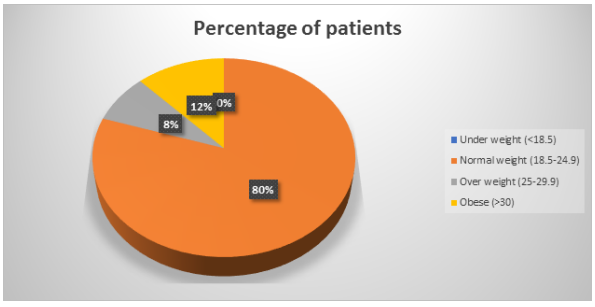


Figure.2. BMI of previous CS women.

Most of the cases 40(80%) had normal weight (BMI=18.5-24.9 Kg/m2). 6(12%) cases had obese (BMI>30 Kg/m2) and 4(8%) had overweight (BMI=25-29.9Kg/m2). No any underweight cases were in our present study.

Table.1. Distribution of gravida of previous CS women.

Gravida	No. of patients	% of patients
Gravida 2	34	68
Gravida 3	9	18
Gravida 4	5	10
Gravida 5	2	4
Total	50	100

In this present study, most of the cases 34(68%) had gravida 2. Lease number of cases 2(4%) had gravida 5.

Table.2. Indications of LSCS in previous CS women.

Indications of LSCS	No. of patients	% of patients
CPD	10	20%
Foetal distress	8	16%
PIH + failure of induction + NPOL	15	30%
Abnormal presentation	7	14%
Oligo + doppler changes	8	16%
Twins	2	4%
Total	50	100%

Most of the cases 15(30%) had undergone LSCS due to PIH with failure of induction with NPOL. 10(20%) cases were indicated for LSCS due to CPD. 8(16%) cases were indicated for LSCS due to foetal distress and oligo with doppler changes.

Table.3. Inter-delivery interval in months and scar thickness in mm of previous CS women.

Inter-delivery interval	No. of patients	% of patients
<18 months	3	6%
18-36 months	27	54%
>36 months	20	40%
Total	50	100%

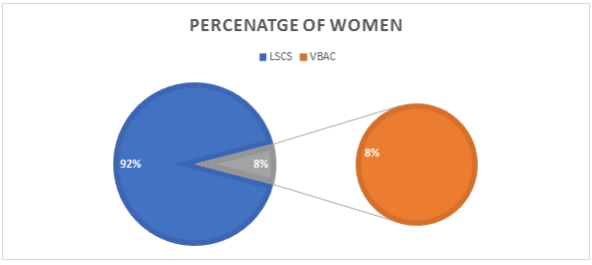
Most of the cases 27(54%) had inter-delivery interval ranges 18-36 months. 20(40%) cases had >36 months delivery interval.

Table.4. Scar thickness previous CS women.

Scar thickness	No of patients	% of patients
2-3.5	21	42%
3.6-5	27	54%
>5	2	4%
Total	50	100%

Majorities of the cases 27(54%) had scar thickness ranges 3.6-5 mm. 21(42%) cases had scar thickness 2-3.5 mm. 2(4%) cases had scar thickness >5mm.

Figure.3. Mode of delivery of previous CS women.



Most of the cases 46(92%) had undergone LSCS. Least number of cases 4(8%) had VBAC mode of delivery.

Table.5. Inter-delivery Interval from last CS and Correlation with Intraoperative Grades II, III and IV of LUS thickness.

Inter-delivery interval	No. of women	Grade I	Grade II	Grade III	Grade IV
<18 months	3(6%)	0	1(33.33%)	1(33.33%)	1(33.33%)
18-36 months	27(54%)	19(70.37%)	5(18.52%)	2(7.41%)	1(3.70%)
>36 months	20(40%)	11(55%)	6(30%)	3(15%)	0(0%)
Total	50(100%)	30(60%)	12(24%)	6(12%)	2(4%)

In this present study, out of 27(54%) cases under duration of 18-36 months, 19(70.37%) cases had grade I thickness of LUS, 5(18.52%) cases had grade II, 2(7.41%) cases had grade III and 1(3.70%) cases had grade IV thickness of lower uterine segment (LUS). In duration of delivery interval greater than 36 months 20(40%) cases, 11(55%) cases had grade I scar, 6(30%) had grade II LUS thickness. In delivery interval less than 18 months cases 3(6%), 1(33.33%) cases had grade I, grade II and grade III LUS thickness.

DISCUSSIONS

Cesarean section is the most common surgical intervention performed in modern obstetrics [9]. Due to rise in Cesarean rate in few years, the number of pregnancies with previous cesarean section has also increased repeat Cesarean section accounting for one-third of all cesarean deliveries [10]. As the increased concerned about the previous cesarean scar rupture or dehiscence playing pivotal role in deciding mode of delivery in patients with previous cesarean scar.

Ultrasound estimation of lower uterine segment A (LUS) provides a fairly simple and non-invasive method for prediction of scar dehiscence/rupture [11].

In this present study, 50 cases with history of at-least one previous caesarean section were enrolled in this study. 20 to 35 years of age patients were included. Maximum number of cases were in age group between 25 to 30 years. Most of the cases had normal weight and had BMI between 18.5 to 24.9 Kg/m2. Majorities of the cases 34(68%) had gravida 2.

As proposed by American college of Obstetrics and Gynaecology [12], women with previous two CS can reasonably be offered TOLAC. One of the major detenents for offering TOLAC in women with previous one CS is early conception/short interpregnancy interval [12]. Our study further confirms the available evidence regarding the usefulness and efficacy of sonographic evaluation of LUS and myometrium for safely predicting the outcome of TOLAC.

Gad MS et al,[13] conducted a study with the aim to correlate lower uterine segment (LUS) thickness measured by both transvaginal (TVS) and transabdominal ultrasonography (TAS) after completion of 36 weeks of pregnancy with that measured manually using a caliper at the time of cesarean delivery and to determine minimum LUS thickness indicative of its integrity in women who have undergone a previous cesarean section. They affirmed that evaluation of the LUS by TVS and TAS and comparison of the results of both with the results obtained by actual measurement intraoperatively indicated that TVS was more reliable and accurate.

In this present study, major indication of LSCS were PIH with failure of induction with NPOL. And 10(20%) cases were indicated for LSCS due to CPD. Inter-delivery interval ranges in majorities of cases 27(54%) had 18-36 months. And 20(40%) cases had >36 months delivery interval. Majorities of the cases 46(92%) had undergone LSCS. 4(8%) cases were undergone VBAC.

Cheung VY,[14] conducted a study to evaluate the accuracy of prenatal sonography in determining the lower uterine segment (LUS) thickness in women with previous Caesarean section and to assess the usefulness of measuring LUS thickness in predicting the risk of uterine rupture during a trial of vaginal birth. Sonographic examination was performed in 102 pregnant women with one or more previous Caesarean sections at between 36 and 38 weeks' gestation to assess the LUS thickness. The author concluded that sonography permits accurate assessment of the LUS thickness in women with previous Caesarean section and therefore can potentially be used to predict the risk of uterine rupture during trial of vaginal birth.

At the opening of the abdominal wall during CS, surgeon made an objective evaluation of the integrity and thickness of the LUS, as described by Qureshi et al. [8]. The LUS was graded as follows: Grade I (LUS was well developed), Grade II (LUS was thin without visible content), Grade III (LUS was translucent with visible content), and Grade IV (LUS had well circumscribed defects, either dehiscence or rupture). All the surgeries were performed by one surgeon (C.D) to rule out the inter-observer variation in the assessment of LUS. The operating surgeon was blinded to the sonographic evaluation of the LUS and myometrium.

In this present study, scar thickness ranges 3.6-5 mm were seen in majorities of the cases 27(54%). 21(42%) cases had scar thickness 2-3.5 mm.

A scar dehiscence develops as a weakened uterus, usually from a previous caesarean section, grows during pregnancy. As the gestation progresses and the uterus expands, the scar may lose integrity, leading to the separation of uterine layers, starting with the inner layers of the uterus and working outward. The defect is considered a dehiscence as long as the serosa layer of the uterus stays intact. Complications of uterine dehiscence are influenced by fetal position, location of the defect, and location of the placenta. Location of the placenta in relation to the defect may also put patients at risk for abnormal adherence of the placenta to the uterine wall. Placenta percreta occurs when placental vessels penetrate the uterine wall. If this occurs, the mother is at risk for severe hemorrhage, hysterectomy, organ reconstruction, and possibly death [15].

In this present study, out of 27(54%) cases under interval of 18-36 months of delivery, majorities of the cases 19(70.37%) cases had grade I thickness of LUS, 5(18.52%) cases had grade II, 2(7.41%) cases had grade III and 1(3.70%) cases had grade IV thickness of lower uterine segment (LUS).

In delivery interval greater than 36 months of cases 20(40%), 11(55%) most of the cases had grade I LUS thickness, 6(30%) had grade II LUS thickness. In delivery interval less than 18 months cases 3(6%), 1(33.33%) cases had grade I, grade II and grade III LUS thickness.

Jastrow et al in a systematic review published in 2010, [16] the aim was to estimate the strength of the association between sonographic thickness of the lower uterine segment in women who had undergone caesarean delivery and uterine scar dehiscence or rupture and to find the best cut-off value for the thickness of the lower uterine segment with regard to predicting uterine dehiscence or rupture.

Uterine rupture can also be responsible for maternal complications, such as genitourinary tract damage, hemorrhage, and hysterectomy. Therefore, it is important to improve the evaluation of the risk of uterine rupture before attempting vaginal delivery after a previous CS. Some studies suggest that this risk can be estimated by measuring sonographically the thickness of the LUS at the end of pregnancy. These studies showed that US measurement of the LUS may increase the safety of labor after a previous CS because it provides additional information on the risk of uterine rupture [16].

CONCLUSIONS

This present study concluded that the scar dehiscence was commonly seen in age 20-30 years. Most common indication of LSCS was PIH with failure of induction with NPOL. 3.5 to 5 mm scar thickness was commonly seen. Most of the cases had grade I LUS thickness. Grade IV LUS thickness was commonly seen in cases with delivery interval < 18 months. Hence, sonographic measurement of thickness of LUS and myometrium is an excellent method for safely predicting the risk of scar dehiscence/rupture in women with previous CS. Sonography plays an important role in monitoring the uterine defect and documenting any changes in lower uterine segment (LUS).

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