

Frequency and Types of Uterine Anomalies during Caesarean Section for Abnormal Presentation

Prathap T.¹, Neha M. Wali², Akshara Prasad³, Ashwini R.⁴

¹Associate Professor, Department of Obstetrics and Gynaecology, JSS Medical College, JSS Academy of Higher Education and Research, Mysore, Karnataka, India. ²Junior Resident, Department of Obstetrics and Gynaecology, JSS Medical College, JSS Academy of Higher Education and Research, Mysore, Karnataka, India. ³Intern, Department of Obstetrics and Gynaecology, JSS Medical College, JSS Academy of Higher Education and Research, Mysore, Karnataka, India. ⁴Junior Resident, Department of Obstetrics and Gynaecology, JSS Medical College, JSS Academy of Higher Education and Research, Mysore, Karnataka, India.

ABSTRACT

BACKGROUND

Abnormal fusion or canalisation of mullerian duct during embryonic life results in congenital uterine malformations. Prevalence of congenital uterine malformations is approximately 2 - 4% in reproductive age group and 5 - 25% in women with adverse pregnancy outcomes. Diagnosis of uterine anomalies has to be made precisely which requires diagnostic modalities like ultrasonography, magnetic resonance imaging, hysterosalpingogram, and hysterolaparoscopy. This observational study is conducted to determine the frequency and types of congenital uterine anomalies discovered during Caesarean section done for abnormal presentations.

METHODS

This is a retrospective observational study conducted in the Department of Obstetrics and Gynaecology of JSS Hospital, Mysuru. A total number of 108 cases were included in the study over a period of 2 years. Patients who underwent Caesarean section due to abnormal presentation were included in the study. After delivery of the foetus and the placenta, uterus was examined for the presence or absence of congenital malformations by digital palpation of the uterine cavity and inspection of fundus of uterus after exteriorisation. Demographic characteristics and the obstetric outcomes were noted.

RESULTS

During the study period of 2 years, 108 Caesarean sections were performed for abnormal presentation in the Department of OBG, JSS Hospital, Mysuru. Out of 108 patients, 15 (13.89%) patients were diagnosed with uterine anomalies and 93 (86.11%) patients had normal uterus. Majority of the patients with uterine anomalies who underwent caesarean section were primigravida (80%) and also majority of them belonged to the age group of 25 - 30 years (73.3%). The most commonly observed uterine anomaly during the study period was arcuate uterus. Though our study included cases only with abnormal presentation, 12 out of 15 (80%) had breech presentation and the rest 3 (20%) had transverse lie. History of miscarriage was found to be higher in patients with uterine anomalies. 53.3% patients with uterine anomaly had preterm delivery & the preterm delivery rate in patients with normal uterus was lesser i.e. 40.9%.

CONCLUSIONS

Congenital uterine anomalies can affect reproductive and obstetric outcomes and hence their accurate diagnosis can benefit several women from adverse outcomes. Caesarean section can be one of the diagnostic modalities for uterine malformations with no increase in the operative time or risk or cost for the patient.

KEYWORDS

Abnormal Presentation, Uterine Anomaly, Caesarean Section, Congenital Malformation

Corresponding Author:

*Dr. Ashwini R,
Junior Resident,
Department of Obstetrics and
Gynaecology,
JSS Medical College,
JSS Academy of Higher Education and
Research, Mysore, Karnataka, India.
E-mail: ashwini.rash@gmail.com*

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BACKGROUND

Abnormal fusion or canalisation of Mullerian duct during embryonic life results in congenital uterine malformations.¹ These anomalies are often asymptomatic and unrecognised. Prevalence of congenital uterine malformations is approximately 2-4% in reproductive age group and 5-25% in women with adverse pregnancy outcomes.^{2,3}

Among the uterine anomalies, uterine septum, unicornuate uterus, bicornuate uterus, uterine didelphys are most common. Uterine anomalies are associated with several adverse outcomes like infertility, recurrent miscarriages, preterm birth, breech presentation, other malpresentations and increased rate of Caesarean section.

Diagnosis of uterine anomalies has to be made precisely which requires diagnostic modalities like ultrasonography, magnetic resonance imaging, hysterosalpingogram and hysterolaparoscopy. Pregnancies occurring in the malformed uterus are most commonly asymptomatic, but should be suspected in patients with recurrent miscarriages and malpresentations.⁴

As abnormal presentation is one of the indications for caesarean section & also seen in anomalous uterus, diagnosis of uterine anomalies can be made intra-operatively, with no increase in operative time or increase in risk to patients. It is also helpful to inform the undiagnosed patients regarding the anomaly, which has an impact on their future obstetric and gynaecological management.⁵

This observational study is conducted to determine the frequency and types of congenital uterine anomalies discovered during Caesarean section done for abnormal presentations.

METHODS

This was a retrospective observational study conducted at the Department of Obstetrics and Gynecology of JSS Hospital, Mysuru. A total number of 108 cases were included in the study in the duration of 2 years. Patients who underwent Caesarean section for abnormal presentation were included in the study.

After delivery of the foetus and the placenta, uterus was examined for the presence or absence of congenital malformations by digital palpation of the uterine cavity and inspection of fundus of uterus after exteriorisation. As there are no guidelines to diagnose uterine septum during Caesarean section, patients were considered to have septate or sub-septate uterus if there was any degree of midline projection interfering with and preventing the approximation of index and middle finger during digital uterine cavity palpation in addition to normal convex uterine fundus. Bicornuate uterus was diagnosed if there was a depression in the uterine fundus with two separate uterine cavities by digital palpation. Unicornuate uterus was diagnosed if there was single uterine cavity with single interstitial portion of

fallopian tube. Arcuate uterus was diagnosed if there was fundal indentation with no interfering septum. Didelphys was diagnosed if there were two well-formed uterine cavities, each with single interstitial portion of fallopian tube.

Demographic characteristics and the obstetric outcomes were noted.

	Normal Uterus	Uterine Anomalies	Total Cases
Total Number	93	15	108
Percentage	86.11%	13.89%	

Table 1. Findings of Uterine Examination during Caesarean Section

	Normal Uterus (93)	Uterine Anomalies (15)	Total (108)
Maternal Age			
<18	00(0%)	00(0%)	00(0%)
19-24	33(35.5%)	03(20%)	36(33.4%)
25-30	49(52.7%)	11(73.3%)	60(55.6%)
31-35	09(9.7%)	01(6.7%)	10(9.2%)
>35	02(2.1%)	00(0%)	02(1.8%)
Parity			
0	54(58.1%)	12(80%)	66(61.1%)
1	33(35.5%)	03(20%)	36(33.4%)
2	05(5.4%)	00(0%)	05(4.6%)
>=3	01(1.0%)	00(0%)	01(0.9%)
Gestational Age (Weeks)			
<28	02(2.1%)	00(0%)	02(1.8%)
28-33	07(7.5%)	02(13.3%)	09(8.3%)
34-36	29(31.2%)	06(40%)	35(32.5%)
37-41	55(59.2%)	07(46.7%)	62(57.4%)
>41	00(0%)	00(0%)	00(0%)
Birth Weight (Grams)			
<1000	01(1.1%)	00(0%)	01(0.9%)
1000-1500	07(7.5%)	01(6.7%)	08(7.4%)
1500-2500	28(30.1%)	06(40%)	34(31.5%)
2500-4000	57(61.3%)	08(53.3%)	65(60.2%)
>4000	00(0%)	00(0%)	00(0%)

Table 2. Distribution of Maternal Age, Parity, Gestational Age, and Birth Weight

Type of Anomaly	No.	%
Arcuate uterus	7	46.7
Septate and subseptate uterus	3	20.0
Bicornuate uterus	3	20.0
Unicornuate uterus	2	13.3
Uterus didelphys	0	0.0

Table 3. Types of Congenital Anomalies

Type of Presentation	With Uterine Anomaly	Without Uterine Anomaly
Breech presentation	12 (80%)	73 (78.5%)
Transverse lie	3 (20%)	12 (12.8%)
Oblique lie	0	6 (6.5%)
Compound presentation	0	2 (2.2%)

Table 4. Types of Abnormal Presentations in Uterine Anomalies

		Normal Uterus	Uterine Anomalies
History of Miscarriage	Yes	23 (24.7%)	7 (46.7%)
	No	70 (75.3%)	8 (53.3%)
Gestational Age at Delivery	Preterm	38 (40.9%)	8 (53.3%)
	During Present Pregnancy	Term	55 (59.1%)

Table 5. Frequency of Uterine Anomalies with Prior Miscarriages and with Preterm Deliveries

RESULTS

During the study period of 2 years, 108 Caesarean sections were performed for abnormal presentation at the Department of OBG, JSS Hospital, Mysuru. Out of 108

patients, 15 (13.89%) patients were diagnosed with uterine anomalies and 93 (86.11%) patients had normal uterus as depicted in table 1. Majority of the patients with uterine anomalies who underwent caesarean section were primigravida (80%) and also majority of them belonged to the age group of 25-30 years (73.3%) as depicted in table 2.

The most commonly observed uterine anomaly during the study period was arcuate uterus with an incidence of 46.7%, followed by septate /subseptate uterus which was 20%. Bicornuate uterus also carried an incidence rate of 20% and the least noted was unicornuate uterus-13.3%. Uterus didelphys, a rare entity, was not found during our study period as depicted in table 3.

Though our study included cases only with abnormal presentation, 12 out of 15 (80%) had breech presentation and the rest 3 (20%) had transverse lie as depicted in table 4. History of miscarriage was found to be higher in patients with uterine anomalies - 46.7% whereas only 24.7% patients with normal uterus had history of miscarriage. Also 53.3% patients with uterine anomaly had preterm delivery & the preterm delivery rate in patients with normal uterus was lesser i.e. 40.9% as depicted in table 5.

DISCUSSION

The development of the female reproductive tract involves a series of complex processes which involves differentiation, migration, fusion and subsequent canalisation of the Mullerian system. Uterine anomalies occur when these processes are interrupted.⁶

Mullerian ducts are identified in close relationship to wolffian ducts during the sixth week of embryonic life. Eventually these two ducts approach each other by fourteenth week below the insertion of inguinal ligament. Later the lower portions fuse to form single canal which further forms epithelial lining of the uterus, cervix & vagina. Bilateral or unilateral developmental failure can occur between 6-10 weeks after conception thus causing absent internal genital organs or unicornuate uterus. Arrested development in next 4 weeks leads to either rudimentary horn or bicornuate uterus. Failure of development after this period causes septate or subseptate uterus. The actual cause of these developmental failures still remains a mystery.⁷

The whole spectrum of uterine anomalies ranges from mild variant like the arcuate uterus which has a slight midline septum and minimal fundal cavity indentation, to the opposite end of the spectrum like Uterine Didelphys which involves complete failure of fusion resulting in two separate uteri. Within this broad spectrum there are other uterine anomalies varying in severity of fusion defects including unicornuate uterus, bicornuate uterus, t-shaped uterus and septate uterus.⁸ One of the most commonly encountered problem during the diagnostic workup amongst cases of recurrent abortion and infertility is congenital uterine anomalies. However, most of the congenital uterine anomalies are incidentally noted during Caesarean sections

in women without any history of recurrent miscarriages or infertility.

In a study conducted at Egypt by M.A. Mohamed and M. Y. Abdelrahman (2018), abnormal presentation was significantly higher in women with uterine anomalies compared to normal uterus during caesarean sections done for variable indications. They reported 112 malpresentations out of 622 patients with normal uterus (18%) and 10 out of 31 patients with uterine anomalies (32.3%).⁹ Another study conducted at Turkey in 1997 quoted an incidence of 6.1% (29 out of 468) of mullerian anomalies during Caesarean section in their study regarding outcome of breech deliveries by S. Erkaya et al.¹⁰ In our study, patients only with abnormal presentation as an indication for caesarean section were considered & the incidence of uterine anomalies in our study was found to be 13.89%.

Among the various abnormal presentations, breech presentation was most commonly associated with uterine anomalies as quoted by various studies. In the year 1990 at Greece, S.P. Michalas conducted a retrospective study on the pregnancy outcome in women with uterine malformations, where it was found that breech presentation was most frequently encountered in uterine anomalies as he noted breech presentation in 38 out of 81 cases with uterine malformations (46.9%).¹¹ Similar results were obtained by another retrospective study at major tertiary care centre at Washington university, ST. Louis, where breech presentation was significantly higher in uterine anomalies (23.6%) compared to normal uterus (3%). Their study was on congenital uterine anomalies and its adverse pregnancy outcomes by Hua MD et al.¹² In our study, 80% (12/15) of patients with uterine anomalies had breech presentation and 20% (3/15) had transverse lie. However, comparison cannot be made as the cases only with abnormal presentation were included in our study and there is no control group.

In 2003 Salim et al, American Fertility Society, proposed modified classification for congenital uterine anomalies.¹³

Uterine Shape	Fundal Contour	External Contour
Normal	Straight or convex	Uniformly convex or with indentation <10 mm
Arcuate	Concave fundal indentation with central point of indentation at obtuse angle (>90 degree)	Uniformly convex or with indentation <10 mm
Subseptate	Presence of septum that does not extend to cervix, with central point of septum at acute angle (<90 degree)	Uniformly convex or with indentation <10 mm
Septate	Presence of uterine septum that completely divides cavity from fundus to cervix	Uniformly convex or with indentation <10 mm
Bicornuate	Two well-formed uterine cornua	Fundal indentation >10 mm dividing the two cornua
Unicornuate With or Without Rudimentary Horn	Single well-formed uterine cavity with single interstitial portion of Fallopian tube and concave fundal contour	Fundal indentation >10 mm dividing the two cornua if rudimentary horn present
Didelphys*	Two well-formed cavities with single interstitial portion of fallopian tube	Two uteri and cervices

Table 6

* Definition not provided in table of Salim et al.

Among these various anomalies, many studies had varying frequencies for each type. M.A. Mohamed & M.Y. Abdelrahman (2018) quoted in their study that the most common anomaly noted was septate/subseptate uterus/arcuate uterus (22/31-70.9%) followed by bicornuate uterus (6/31-19.35%), then unicornuate uterus (2/31-6.45%), the least common was didelphys. They found only one case during their study period (1/31-3.23%).⁹ In our study, the most common type of uterine anomaly noted was arcuate uterus, followed equally by septate/subseptate and bicornuate uterus & the least being unicornuate uterus. Uterus didelphys was not found in our study period and is also a rare entity.

Mullerian developmental anomalies may affect the functional & structural alteration of cervix and uterine musculature that can cause adverse pregnancy outcomes like preterm delivery, miscarriages etc. Hua M et al reported in their study that incidence of preterm delivery of 39.7% was significantly higher compared to control group with incidence of 10.4%.¹² In another study by N.S. Fox et al (2013) which was a retrospective cohort study at New York and was based on type of uterine anomaly and its adverse pregnancy outcome. Incidence of preterm delivery was found to be 28.9% in patients with uterine anomalies compared to 8.9% in controls which was statistically significant.⁸ In our study, the rate of preterm delivery was higher in cases with uterine anomalies (53.3%).

Miscarriage is another major adverse outcome. Various studies quoted higher rate of miscarriages in uterine anomalies. One such study by M.A. Mohamed & M.Y. Abdelrahman in 2018 where history of miscarriage in uterine anomalies was included in their study, concluded that history of miscarriages was significantly higher in patients with uterine anomalies with an incidence of 58.1% compared to the control group (34.6%).⁹ Even in our study, patients with uterine anomalies were more commonly associated with previous history of miscarriage (46.67%). However, the study was only on patients with abnormal presentations and hence there was no control group to compare.

CONCLUSIONS

Congenital uterine anomalies can affect reproductive and obstetric outcomes and hence their accurate diagnosis can benefit several women from adverse outcomes. Caesarean section can be one of the diagnostic modalities for uterine malformations. Hence, we recommend that routine uterine examination during caesarean section, both internally & externally, should be practiced by all obstetricians as it can give valuable information regarding the diagnosis of uterine anomalies with no increase in the operative time or risk or cost to the patient.

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