Section: Obstetrics and Gynaecology

Original Research Article

SECOND STAGE CAESAREAN SECTION: AN ANALYSIS OF CLINICAL PROFILE, INTRAOPERATIVE COMPLEXITY AND POSTOPERATIVE MORBIDITY AT A TERTIARY CARE TEACHING HOSPITAL

Sreelakshmi U[1], Bushra Shereen[2]

[1]Professor, Department of Obstetrics and Gynaecology, Malla Reddy Medical College for Women, Hyderabad, Telangana, India.
[2]Associate Professor, Department of Obstetrics and Gynaecology, Malla Reddy Medical College for Women, Hyderabad, Telangana, India.

Received *: 12/03/2025*
Received in revised form *: 05/05/2025*
Accepted *: 28/05/2025*

Corresponding Author:
Dr. Bushra Shereen,
Associate Professor, Department of Obstetrics and Gynaecology, Malla Reddy Medical College for Women, Hyderabad, Telangana, India.
Email: bushrashereen14@gmail.com

DOI: 10.70034/ijmedph.2025.2.313

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (2); 1751-1755

ABSTRACT

Background: Caesarean sections performed during the second stage of labor are associated with increased maternal and neonatal risks compared to first-stage and elective caesarean sections. This retrospective study was undertaken to analyze the demographic and obstetric characteristics, intraoperative and postoperative complications and neonatal outcomes associated with second-stage C-sections.

Materials and Methods: This retrospective study was conducted by reviewing medical records of women who underwent second-stage caesarean sections over a period of 3 years in the department of Obstetrics and Gynaecology, Malla Reddy Narayana Multispecialty hospital which is a tertiary care teaching centre. Data was collected on demographic variables (maternal age and parity), obstetric variables (Booking status, gestational age and indication for C-section), intraoperative complications (uterine incision extension, blood loss and organ injury), postoperative outcomes (fever and wound infection) and neonatal parameters (Apgar scores, NICU admissions and neonatal morbidity).

Results: The analysis revealed that second-stage C-sections were more common in primigravida and were frequently associated with indications such as non-progress of labor and fetal distress. Intraoperative complications included a higher incidence of postpartum hemorrhage and uterine incision extensions. Postoperative morbidities such as febrile illness and wound infections were noted. Neonatal outcomes showed increased NICU admissions and lower Apgar scores, particularly in cases with prolonged second stage or difficult fetal extraction.

Conclusion: Second-stage Caesarean sections are associated with a higher risk of maternal and neonatal complications. Early identification of risk factors and timely obstetric interventions are crucial to improving outcomes. Retrospective analysis of such cases helps in understanding patterns and guiding future clinical practice.

Key words: Second stage caesarean section, deeply impacted head, difficult extraction, full dilatation, Patwardhan technique.

INTRODUCTION

Caesarean section is one of the most frequently performed surgical procedures in obstetrics, with its incidence increasing globally. Among the various types, caesarean sections carried out during the second stage of labor i.e., after full cervical dilation pose unique challenges and are associated with increased maternal and neonatal risks.

Second-stage caesarean sections are typically necessitated by indications such as fetal distress, non-progression of labor or failed instrumental delivery.[1] Compared to caesarean sections performed in the first stage, those performed in the

second stage are technically more demanding due to the deeply engaged fetal head, leading to a higher likelihood of intraoperative complications such as uterine incision extensions, significant blood loss and injury to surrounding organs. Postoperative complications may include infections, delayed recovery and prolonged hospital stay. Neonates delivered during this stage are also at higher risk for birth trauma and compromised Apgar scores.[2]

The delivery of the impacted fetal head presents a significant challenge and various methods such as the push technique, Patwardhan and modified Patwardhan, or the use of instruments are employed, each with its own risk profile. The choice of method can influence both maternal and neonatal outcomes.

Understanding the demographic and obstetric variables, indications for second-stage caesarean delivery, methods of fetal head extraction, and the associated intraoperative and postoperative complications is critical for improving clinical practice and outcomes.

This retrospective observational study aims to analyze these parameters to provide insight into the challenges and outcomes associated with second-stage caesarean sections, contributing to evidence-based strategies in obstetric care.

MATERIALS AND METHODS

This retrospective observational study was conducted in the department of Obstetrics and Gynaecology, Malla Reddy Narayana Multispecialty hospital, a tertiary care teaching centre, over a period of three years from December 2021 to December 2024. The study was approved by the Institutional Ethics Committee, and confidentiality of patient information was maintained throughout.

All patients who underwent a caesarean section during the second stage of labor (defined as full cervical dilatation to delivery of the fetus) within the study period were included. Cases were identified from the labor room and operation theatre registers.

Inclusion Criteria

1. Women who underwent second-stage caesarean section
2. Singleton pregnancies
3. Gestational age ≥ 36 weeks

Exclusion Criteria

1. Caesarean sections performed during the first stage of labor
2. Multiple gestation
3. Incomplete or missing medical records

Data was collected retrospectively from patient's case sheets, operative notes, and neonatal records. The following variables were analyzed:

- Maternal demographic details like age and parity.
- Obstetric data like booking status, gestational age at delivery, indication for second-stage caesarean section.
- Intraoperative findings and complications like method used for delivery of deeply impacted fetal head, difficulty in fetal extraction, extension of uterine incision, postpartum hemorrhage, injury to uterine vessels, uterine angle hematoma, vertical tear of the lower uterine segment, bladder or ureteric injury, hematuria and need for blood transfusion.
- Postoperative complications like febrile morbidity, wound infection or dehiscence and postpartum voiding dysfunction.
- Neonatal outcomes like APGAR scores at 1 and 5 minutes, requirement of neonatal resuscitation, admission to NICU, birth asphyxia, respiratory distress syndrome, meconium aspiration syndrome, neonatal sepsis and birth injury.

Data was entered into Microsoft Excel and analyzed. Frequency and percentages were calculated for categorical variables.

RESULTS

A total of 58 cases in whom second stage caesarean section was performed were analyzed in this study.

Table 1: Distribution of Age

Age (Years)	No. of Cases	Percentage
20–25 years	19	32.75%
26–30 years	28	48.27%
31–35 years	8	13.79%
>35 years	3	5.17%
Total (N)	58	100%

Table 2: Distribution of Parity

Parity	No. of Cases	Percentage
Primipara	36	62.06%
Multipara	22	37.93%
Total (N)	58	100%

Table 3: Distribution of Gestational Age

Gestational Age (weeks)	No. of Cases	Percentage
36–37 weeks	2	3.44%
37+1 –38 weeks	10	17.24%

38+1–39 weeks	16	27.58%
39+1–40 weeks	23	39.65%
40+1–41weeks	7	12.06%
Total (N)	58	100%

Table 4: Booking Status

Booking status	No. of cases	Percentage
Booked	33	56.89 %
Unbooked	25	43.10%
Total (N)	58	100%

Table 5: Indication for Second Stage Caesarean Section

Indication	No. of Cases	Percentage
Non-descent of fetal head	17	29.31%
Non-reassuring NST	15	25.86%
Deflexed head	9	15.51%
Deep transverse arrest	7	12.06%
Persistent occipito-posterior position	4	6.89%
Failed instrument delivery	4	6.89%
Cephalopelvic disproportion	2	3.44%
Total	58	100%

Table 6: Method Used to Deliver Fetal Head

Method	No. of Cases	Percentage
Vertex with and without instrument assistance	36	69.06%
Patwardhan Technique	8	13.79%
Modified Patwardhan Technique	4	6.89%
Push Technique	10	17.94%
Total	58	100%

Table 7: Intraoperative Complications

Intraoperative Complications	No. of Cases	Percentage
Blood transfusion	19	32.75%
Postpartum hemorrhage	18	31.03%
Extension of uterine angle	11	18.96%
Injury to uterine vessels	10	17.24%
Uterine angle hematoma	8	13.79%
Vertical tear of lower uterine segment	4	6.89%
No complications	24	41.37%

Table 8: Postoperative Complications

Postoperative Complication	No. of Cases	Percentage
Febrile illness	8	13.79%
Postpartum voiding dysfunction	7	12.06%
Wound infection	5	8.62%
Wound gape	3	5.17%

Table 9: Neonatal Complications

Neonatal Complication	No. of Cases	Percentage
NICU admission	20	34.48%
APGAR score <7 at 5 minutes	18	31.03%
Respiratory distress syndrome	10	17.24%
Meconium aspiration syndrome	8	13.79%
Birth asphyxia	4	6.89%
Neonatal sepsis	4	6.89%
Birth injury	1	1.72%

DISCUSSION

This study evaluated the demographic parameters, obstetric parameters, indications, intraoperative challenges, maternal and neonatal outcomes and postoperative complications associated with caesarean sections performed during the second stage of labor. Our findings reinforce the growing concern that caesarean deliveries at full cervical dilation are associated with increased maternal and neonatal morbidity compared to first-stage caesarean sections.

Analysis of the demographic parameters in this study showed that 48.27% of the women belonged to the age group 26 to 30 years. A study done by Moodley et al. showed the mean age of cases studied was 23.79 ± 5.7 years and a study done by Govender et al. reported a mean age of 25.2 years.[3,4] In this study, the distribution of women according to their parity showed that 62.06 %

women were primipara and 37.93 % of the women were multipara. Similarly, a study by Babre et al. showed that 74 % of the women were primipara and 26% were multipara.[5] This study depicted that maximum of women (39.65 %) had a gestational age between 39 and 40 weeks. Similarly, a study done by Charmy et al showed that majority of the women (53.7 %) had a gestational age between 39 to 40 weeks.[6]

In this study, the most frequent indications for second stage caesarean section were found to be non-descent of fetal head (29.31 %) and non-reassuring NST (25.86%) followed by deflexed head (15.51%) and deep transverse arrest (12.06%). A study done by Babre et al showed that the most frequent indications were non-descending head, deflexed head, DTA, failed vacuum, and occipito-posterior position.[5] According to Goswami et al., DTA (14%) and deflexed head (16%) were the two most frequent indications for LSCS in the second stage of labor, accounting for 38% of the cases.[7]

One of the most prominent findings in this study was the difficult fetal extraction, requiring different techniques like Patwardhan (13.79 %), modified Patwardhan (6.89 %) or push method (17.94 %). According to study by Babre et al., the most used method of delivery was vertex (67.2%), followed by Patwardhan (23%) and push method (9.8%).[5] Furthermore, a study by Kumaresan et al. showed that the most common method of delivery is the Patwardhan technique (44.8%), push method (27.2%), conventional method (17.2%) and reverse breech extraction (pull method) (10.8%).[8] This highlights the anatomical and physiological challenges of operating in a deeply engaged fetal head, which not only prolongs the procedure but also increases the risk of uterine incision extensions and excessive blood loss. Our findings are consistent with previous studies, such as those by Allen et al. and Holm et al., which have also reported elevated rates of uterine trauma and postpartum hemorrhage in second-stage cesarean deliveries.[9,10]

The most frequent intraoperative complications noted in this study were need for blood transfusion (32.75 %), postpartum hemorrhage (31.03 %), followed by extension of uterine angles (18.96 %). The post-operative complications noted in this study were febrile illness (13.79 %), postpartum voiding dysfunction (12.06 %), wound infection (8.62 %) and wound gape (5.17 %). In a study done by Anusha SR et al. PPH was seen in 74% of the women and was the main complication, followed by a blood transfusion that involved 58 % of the women and the incidence of uterine tear was 16%.[11] A study done by Jayaram et al. demonstrated that, PPH occurred in 19.23%, lower uterine segment tear and angle extension occured in 15.38%, febrile illness in 15.38%, blood-stained urine in 19.23% and wound sepsis in 3.84% of the women under going second stage caesarean section.[12]

Neonatal outcomes in our cohort, including increased NICU admissions (34.48%) and lower Apgar scores (31.03%), suggest compromised fetal condition due to prolonged labor, difficulty in delivery of deeply impacted fetal head or failed instrumental attempts before surgical intervention. A study done by Gurung et al. demonstrated Apgar score <7 at 5 minutes in 9% and fresh stillbirth in 0.6%.[13] These results underscore the need for early referral of cases from primary health care centers, timely decision-making and early identification of failure to progress in the second stage of labor.

Moreover, second-stage caesarean sections were associated with longer operative times and greater need for surgical expertise.[14] This suggests the importance of ensuring that such high-risk procedures are performed by experienced obstetricians, ideally with senior support available. The utility of techniques like the push or pull method for disimpaction of the fetal head and different methods to deliver a deeply impacted fetal head should be emphasized in training programs.

Limitations of this study includes its retrospective design. Furthermore, variations in surgical technique and decision-making thresholds across practitioners could have influenced outcomes. Nevertheless, the findings highlight the need for protocols aimed at early identification of second-stage dystocia and for strategies to reduce the primary caesarean rate, such as judicious use of operative vaginal delivery.

CONCLUSION

In conclusion, caesarean delivery during the second stage of labor poses significant challenges and risks. While sometimes unavoidable, the decision should be made with an awareness of the potential complications and the importance of operator skill. Future research should focus on developing standardized management protocols and exploring preventive strategies, including labor support techniques and timely interventions.

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