

MATERNAL AND NEONATAL COMPLICATIONS WITH BREECH EXTRACTION DURING 2ND STAGE LOWER SEGMENT CESAREAN SECTION (LSCS); A CROSS-SECTIONAL STUDY

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Abstract

Background:

Breech extraction method needs to be conducted during a second-stage Lower Segment Cesarean Section (LSCS), which causes complications since the unborn baby needs to be delivered through an obstructed birth canal while the woman experiences advanced labor.

Objective:

Research aims to investigate how often maternal and neonatal complications occur during breech extraction procedures that take place during second-stage LSCS surgeries.

Methods:

The cross-sectional study was conducted at the Department of Obstetrics & Gynecology at Liaquat University of Medical & Health Sciences, Jamshoro. The Study consists of 120 women between 18 and 40 years old who were pregnant with one baby and needed emergency second-stage LSCS surgery. Researchers evaluated maternal outcomes through measurement of postpartum hemorrhage (PPH), uterine incision extension, bladder and uterine artery damage, wound infection, febrile morbidity, blood transfusion requirement, and obstetric hysterectomy. Researchers measured neonatal outcomes through assessment of NICU admission, birth asphyxia, stillbirth, and early neonatal death.

Results:

A frequent complication in mothers was that of uterine incision extension occurring in 18.3%. The next common complication in mothers was blood transfusion at 15.8%, while postpartum hemorrhage was recorded at 11.7%. Neonatal ICU admission was the highest recorded complication in infants at 48.3%, while birth asphyxia was recorded at 16.7%. Other complications noted included neonatal death occurring in 5% of cases and stillbirths in 3.3% of the cases.

Conclusion:

Doctors who perform second-stage LSCS with breech extraction create significant health risks for both mothers and their babies, which makes it essential to schedule medical operations and use skilled surgical techniques.

INTRODUCTION

The most common surgical procedure for women throughout the world involves performing Caesarean sections. Hospitals have made significant efforts to reduce the number of operative abdominal births. Yet, these efforts have resulted in an alarming increase in Caesarean section (CS) rates, which consequently creates more hazardous situations for both mothers and their unborn children [1]. Approximately one-fourth of primary cesarean sections are performed during the second stage of labour; these procedures are significantly more complicated than those performed in the first stage [2]. Neonatal mortality and morbidity due to hypoxia and fetal trauma remain major concerns regarding late-stage interventions [2].

The second stage of labor begins when cervical dilatation is complete and ends with fetal delivery. While guidelines have recently extended the duration of this stage up to three hours with regional anesthesia in primigravida, performing a CS with the extraction of a deeply impacted fetal head remains technically challenging [3]. This procedure is associated with elevated maternal risks, including unintentional extensions of the uterine incision into the vascular broad ligament, prolonged operation times, and postpartum hemorrhage [4].

Serious neonatal complications are also prevalent, such as skull injuries causing cerebral hemorrhage and newborn hypoxia, which result in higher neonatal admission rates [4]. Management of an impacted fetal head during second-stage labor requires a careful and gentle technique to avoid adverse outcomes. Conventional teaching suggests that the inferior pole of the fetus should be delivered first through a lower uterine segment incision, a technique known as breech extraction [5]. Multiple factors contribute to the increasing trend of second-stage caesareans, including a decline in instrumental

delivery training, lack of supervision in decision-making, and concerns regarding litigation [6].

Data in Pakistan regarding these specific complications is scarce, and the present study is necessary to bridge this gap. Previous studies in India observed intra-operative complications such as PPH (8%), extension of uterine incision (16%), and NICU admissions as high as 44% to 60% [8, 9]. Understanding these frequencies is essential for healthcare providers to formulate appropriate interventions and improve maternal and child health outcomes. Therefore, the objective of this study is to determine the maternal and neonatal complications with breech extraction during the 2nd stage LSCS.

METHODS

This is an observational cross-sectional study carried out between October 2025 to February 2026 in the Department of Obstetrics & Gynecology Unit 4, LUMHS Jamshoro. A total sample size of 120 pregnant females would be taken through non-probability consecutive sampling.

- **Inclusion criteria:** Women within the age group of 18-40 years, pregnancy beyond 37 weeks, singleton pregnancy, and requiring emergency LSCS in the second stage of delivery.

- **Exclusion criteria:** Women who have experienced intrauterine fetal death, multiple pregnancies, fetal malformation, low-lying placenta, or maternal comorbidities, including hypertension and GDM.

- **Data collection:** After taking informed consent, the patients will be enrolled, and demographic details like age, body mass index (BMI), and parity will be noted. All surgeries will be performed under the supervision of senior residents or gynecologists with a minimum of 3 years' experience. Complications in mothers, such as post-partum hemorrhage (PPH) (excessive blood loss more than 1000 ml), bladder injury, and uterine tear more than 15 cm would be

noted. Similarly, complications in infants, stillbirth, and others, would be recorded. including NICU admission, birth asphyxia,

RESULTS

Table 1: Socio-Demographic and Obstetric Profile of Participants (n=120)

This table summarizes the baseline characteristics of the women included in the study.

Variable	Statistics / n(%)
Age (Years)	27.4 $\pm$ 5.1 (Mean $\pm$ SD)
BMI (kg/m ²)	25.8 $\pm$ 4.2 (Mean $\pm$ SD)
Gestational Age (Weeks)	38.6 $\pm$ 1.2 (Mean $\pm$ SD)
Residence	
- Urban	74 (61.7%)
- Rural	46 (38.3%)
Booking Status	
Booked	52 (43.3%)
Unbooked	68 (56.7%)
Type of Breech (on USG)	
Complete	38 (31.7%)
Frank	42 (35.0%)
Footling	30 (25.0%)
Kneeling	10 (8.3%)

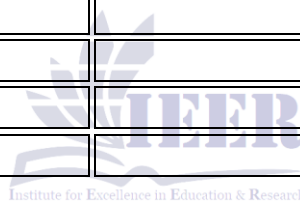


Table 2: Frequency of Maternal Complications (n=120)

Maternal outcomes were assessed intraoperatively and followed up to 6 weeks post-delivery¹¹.

Maternal Complication	Frequency (n)	Percentage (%)
Postpartum Hemorrhage (PPH)	14	11.7%
Extension of Uterine Tear	22	18.3%
Bladder Injury	5	4.2%
Uterine Artery Injury	8	6.7%
Broad Ligament Hematoma	4	3.3%
Obstetric Hysterectomy	3	2.5%
Wound Infection	10	8.3%
Need for Blood Transfusion	19	15.8%
Febrile Illness	12	10.0%

Table 3: Frequency of Neonatal Complications (n=120)

Neonatal outcomes focused on immediate birth trauma and respiratory stability.

Neonatal Complication	Frequency (n)	Percentage (%)
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Neonatal Complication	Frequency (n)	Percentage (%)
NICU Admission	58	48.3%
Birth Asphyxia	20	16.7%
Neonatal Jaundice	15	12.5%
Stillbirth	4	3.3%
Early Neonatal Death	6	5.0%

Table 4: Stratification of Complications by Booking Status

This analysis identifies if the lack of prenatal care influences surgical outcomes²⁷.

Outcome Variable	Booked (n=52)	Unbooked (n=68)	p-value
Maternal PPH	4 (7.7%)	10 (14.7%)	0.04*
Extension of Tear	8 (15.4%)	14 (20.6%)	0.09
NICU Admission	18 (34.6%)	40 (58.8%)	0.01*

*Statistically significant ($p < 0.05$) using the Chi-square test.

DISCUSSION

Second-stage Lower Segment Cesarean Section (LSCS) with breech extraction is considered one of the most difficult operations. The difficulty arises during delivery at full cervical dilatation because of an impacted fetal head, a thin lower uterine segment, and reduced space. These problems increase morbidity during and after the operation compared with cesarean delivery in the first stage of labor [1, 2].

In the present study, the most common complication during cesarean delivery was uterine incision extension, which accounted for 18.3%. This complication has also been found in other studies in the same region, with an incidence of approximately 16% [9]. The extension of the uterine incision is usually associated with the disengagement of the deeply impacted fetal head. The extensions can include the broad ligament and the vascular structures [3, 4]. Such extensions increase operative duration, blood loss, and the likelihood of further surgical interventions.

Postpartum hemorrhage (PPH) was also found, which was 11.7%. This was slightly higher than the 8% previously documented in the literature [9,10]. This could be attributed to various causes, including uterine atony following prolonged labor, trauma from incision extension, and increased intraoperative manipulation. This was

supported by the fact that 15.8% of the patients underwent blood transfusions, which emphasizes the effect that second-stage cesarean delivery has on the patient.

Bladder injury (4.2%) and uterine artery injury (6.7%) were also complications that were encountered. Though less common, these injuries are known risks for women who are in advanced labor, with distortion of the pelvic anatomy and downward displacement of the bladder by the impacted fetal head [3,7]. Although relatively uncommon, such injuries contribute to increased postoperative morbidity and longer hospital stay.

The morbidity in the neonates was also significant. Almost half (48.3%) of the neonates had to be admitted to the NICU, which is consistent with previously reported figures for 44–60% in second-stage cesarean sections [9,10]. Birth asphyxia was seen in 16.7% of the neonates. These findings could be attributed to prolonged second-stage labor, fetal hypoxia before section, and manipulation during extraction [2,4]. Early neonatal mortality and stillbirth further stress the vulnerability of fetuses in obstructed and prolonged labor.

The unbooked patients had a significantly higher incidence of PPH ($p=0.04$) and NICU admission ($p=0.01$), which is consistent with the findings

when patients have had inadequate antenatal supervision and have had a delayed referral, resulting in a higher morbidity for both the mother and the baby [1,7].

The findings in this study are consistent with existing regional and international data that have shown that second-stage LSCS with breech extraction is associated with a higher morbidity for both the mother and the baby when compared with cesarean sections that have been performed earlier in the course of the labor [2,4,8]. The findings stress the importance of experienced surgeons and the need for meticulous technique in performing cesarean sections.

DISCUSSION

The practice of executing second-stage lower segment cesarean section (LSCS) at complete cervical expansion results in higher maternal and neonatal health complications than first-stage labor cesarean deliveries [1,2,13,15]. The procedure faces major technical challenges because the fetal head has become deeply impacted, the lower uterine segment has decreased in size, and the pelvic region shows altered anatomical structure [2,4,14].

Uterine incision extension (18.3%) represented the most common maternal complication in this research study. The figure matches the established range of 15% to 25% which exists for second-stage cesarean sections [3,6,8,15]. Research studies show that full-dilatation cesarean deliveries have higher extension rates than first-stage procedures [13,15]. The impacted head becomes disengaged through the process of extension which may involve both the broad ligament and nearby blood vessels resulting in greater blood loss and extended operational time [4,14].

The incidence of postpartum hemorrhage (PPH) reached 11.7%, which matches the documented range of 8–15% found in comparable patient groups [6,8,12,15]. Uterine atony develops from extended labor, while surgical manipulation and incision extension together lead to increased blood loss [2,3]. The study recorded a 15.8% transfusion rate, which demonstrates

hemodynamic effects from second-stage LSCS and matches large retrospective studies that found higher transfusion rates during cesarean sections that reached full dilatation [1,12,13].

Women experiencing advanced labor face the risk of bladder and uterine artery injuries, which occur less frequently but still stand as recognized complications because of metabolic fluid retention and the gravitational movement of pelvic organs [2,4]. The analysis of challenging cesarean delivery methods demonstrates that altered anatomical structure during second-stage operations leads to higher chances of damaging nearby organs [14]. The comparative outcome studies that compared first-stage and second-stage cesarean deliveries showed similar findings according to these studies [13,15].

The study identified substantial neonatal morbidity, with 48.3% of neonates needing NICU admission. The current rate matches previous studies, which found second-stage cesarean sections to have a 40-60% admission rate [6,8,15]. Prolonged second-stage labor and fetal hypoxia that existed before the delivery are the main factors causing neonatal compromise in these cases, according to evidence [2,4,13]. The occurrence of birth asphyxia in this group shows how delayed surgical treatment affects patient outcomes.

Research shows that reverse breech extraction reduces uterine damage while improving some neonatal outcomes, but fetal status at delivery remains the primary factor affecting overall results [4,5,11,14]. Maternal and neonatal outcomes depend on two main factors, which are the timing of medical intervention and the skills of the surgical team.

The study found unbooked patients had higher PPH and NICU admission rates, which matches evidence showing that inadequate prenatal care and delayed patient transfer causes extended delivery duration and more complex surgical procedures [1,6,15]. Dystocia identification during labor requires early diagnosis, which enables appropriate decision-making to decrease the need for difficult technical second-stage procedures.

Overall, the results of this study are consistent with the current literature that supports that second-stage LSCS is associated with increased risks of uterine incision extension, bleeding, transfusion, and fetal morbidity compared to first-stage cesarean delivery [2, 13-15]. Although reverse breech extraction is considered in the management of impacted fetal heads, the best outcome is largely dependent on prompt surgical intervention and fetal status before operation.

CONCLUSION

Second-stage Lower Segment Cesarean Section with breech extraction has been found to carry a considerable risk for both maternal and neonatal morbidity. The present study showed that the two most frequent maternal complications were uterine incision extension and postpartum hemorrhage which required blood transfusions. Neonatal morbidity showed its highest rate through two indicators which were neonatal intensive care unit admissions and cases of birth asphyxia.

These findings underscore the need for timely decision-making, better intrapartum monitoring, and supervision by senior surgeons for second-stage cesarean sections. Antenatal care needs to be strengthened by early referral to prevent advanced labor, which carries the risk of technically demanding procedures.

Further large-scale studies are recommended to quantify better and refine procedures for managing an impacted fetal head during second-stage LSCS.

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REFERENCES

- Gurung P, Malla S, Lama S, Malla A, Singh A. Cesarean Section During Second Stage of Labor in a Tertiary Centre. *J Nepal Health Res Counc.* 2017 Sep 8;15(2):178-181. doi: 10.3126/jnhrc.v15i2.18210. PMID: 29016591.
- S. R. A, A. V. D, Jacob KJ. Maternal and neonatal outcome in second stage cesarean section versus first stage: a comparative study. *Int J Reprod Contracept Obstet Gynecol* [Internet]. 2018 Oct. 25;7(11):4640-5.
- Jayaram J, Mahendra.G, Vijayalakshmi.S. Fetomaternal Outcome in Cesarean Sections Done in Second Stage of Labor [Internet]. *Indian J Obstet Gynecol Res.* 2016;3(1):51-54.
- Lenz F, Kimmich N, Zimmermann R, Kreft M. Maternal and neonatal outcome of reverse breech extraction of an impacted fetal head during caesarean section in advanced stage of labour: a retrospective cohort study. *BMC Pregnancy Childbirth.* 2019 Mar 27;19(1):98. doi: 10.1186/s12884-019-2253-3. PMID: 30917799; PMCID: PMC6437943.
- Safdar F, Majeed N, Nisa K, Nasir H, Mushtaq I, Tariq S. Feto-maternal Outcome of Reverse Breech Extraction versus Disimpaction of Fetal Head in Caesarean Section for Obstructed Labour. *JRMC.* 2022 Dec. 31;26(4).
- Gupta K, Garg A. Fetomaternal outcome in caesarean section at full dilatation. *Int J Reprod Contracept Obstet Gynecol.* 2019 Jul. 26;8(8):3098-101.
- Macharey G, Toijonen A, Hinnenberg P, Gissler M, Heinonen S, Ziller V. Term cesarean breech delivery in the first pregnancy is associated with an increased risk for maternal and neonatal morbidity in the subsequent delivery: a national cohort study. *Arch Gynecol Obstet.* 2020 Jul;302(1):85-91. doi: 10.1007/s00404-020-05575-6. Epub 2020 May 14. PMID: 32409926; PMCID: PMC7266798.
- Goswami KD, Parmar MM, Kunjadiya AN. Study of fetomaternal outcome in second stage caesarean section. *Int J Reprod Contracept Obstet Gynecol.* 2019 May 28;8(6):2169-71.

- A Comparative Study of Maternal and Foetal Outcome between Reversed Breech Extraction Technique and Foetal Pillow, During Caesarean Section in Full Dilatation (CSFD), In Second Stage of Labour. *jemds*. 2024 Jun. 29;13(4):109.
- Allen VM, O'Connell CM, Liston RM, Baskett TF. Maternal morbidity associated with cesarean delivery without labor compared with spontaneous onset of labor at term. *Obstet Gynecol*. 2003 Sep;102(3):477-82. doi: 10.1016/s0029-7844(03)00570-2. PMID: 12962927.
- Fasubaa OB, Ezechi OC, Orji EO, Ogunniyi SO, Akindele ST, Loto OM, Okogbo FO. Delivery of the impacted head of the fetus at caesarean section after prolonged obstructed labour: a randomised comparative study of two methods. *J Obstet Gynaecol*. 2002 Jul;22(4):375-8. doi: 10.1080/01443610220141290. PMID: 12521457.
- Qadir M, Amir S. MATERNAL MORBIDITY ASSOCIATED WITH CAESAREAN SECTION IN SECOND STAGE OF LABOR. *JMS*. 2017 Jun.1;25(2):242-5.
- Alexander JM, Leveno KJ, Rouse DJ, Landon MB, Gilbert S, Spong CY, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ, Sorokin Y, Miodovnik M, O'Sullivan MJ, Sibai BM, Langer O, Gabbe SG; National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units Network (MFMU). Comparison of maternal and infant outcomes from primary cesarean delivery during the second compared with first stage of labor. *Obstet Gynecol*. 2007 Apr;109(4):917-21. doi: 10.1097/01.AOG.0000257121.56126.f. PMID: 17400854.
- Waterfall H, Grivell RM, Dodd JM. Techniques for assisting difficult delivery at caesarean section. *Cochrane Database Syst Rev*. 2016 Jan 31;2016(1):CD004944. doi: 10.1002/14651858.CD004944.pub3. PMID: 26827159; PMCID: PMC8676064.
- Pergialiotis V, Vlachos DG, Rodolakis A, Haidopoulos D, Thomakos N, Vlachos GD. First versus second stage C/S maternal and neonatal morbidity: a systematic review and meta-analysis. *Eur J Obstet Gynecol Reprod Biol*. 2014 Apr;175:15-24. doi: 10.1016/j.ejogrb.2013.12.033. Epub 2014 Jan 3. PMID: 24447469.