

Comparison of Perinatal Outcomes of two Methods to Assist Delivery for Impacted Fetal Head at Cesarean Birth

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Abstract:

Background: Impacted fetal head is a challenging obstetrical situation at second stage cesarean births. Among different techniques, reverse breech extraction and conventional head push techniques are the two widely used techniques.

Objective: To compare perinatal outcomes of breech extraction method Vs head push technique to assist delivery for impacted fetal head at cesarean birth

Material and Methods: This comparative cross-sectional study was conducted in the Gynea Department, Lady Reading Teaching Hospital, Peshawar, from 1st Feb 2019 till 31 Jan 2022. A total of 170, patients with alive fetus, cephalic presentation, undergoing second stage cesarean sections with deeply impacted fetal head and with baby delivered either via push up technique or reverse breech extraction technique were included in the study. Patients were divided in to two equal groups based on the technique of fetal delivery. The two groups were compared for perinatal outcomes of Low APGAR score, NICU admissions and early neonatal deaths.

Results: Of the total 170 patients, 85 were in each group. Mean age was 29.66 ± 4.41 , with range from 18 to 40 years. Sixty-one (61%) percent women were multiparas and 39% were primiparas. Mean gestational age of study participants was 39.42 ± 1.37 . Statistically significant difference was observed between Group II (reverse breech extraction) and Group I (standard head push) for low APGAR score ($<7/10$) at 5 minutes i.e. 13 (13.29%) vs 26 (30.59%) ($p=0.018$). Neonatal intensive care admission rate was 24 % for Group II and 38% for Group I ($p=0.066$). The difference in neonatal death between two groups was not statistically significant, i.e. 4% vs 6% ($p=0.77$).

Conclusion: Reverse breech extraction technique has the advantage over conventional head push technique in term of reduced rates of low APGAR scores at 5 minutes of birth.

Key words: Second stage cesarean section, impacted fetal head, reverse breech extraction, head push technique, APGAR score.

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Introduction

Cesarean section at full cervical dilatation (second stage cesarean section) is known to be associated with significant fetomaternal morbidity. A unique challenge is the delivery of deeply impacted fetal head. The diagnosis of deeply impacted fetal head is subjective and is often described as difficulty in delivery of fetal head with surgeons usual operating hand, "requiring additional maneuvers" to deliver fetal head.¹

The exact incidence of impacted fetal head is not known because of subjectivity of diagnosis of condition. Recent studies done in UK reported an incidence of 10% for emergency cesarean section and 1.5% for all births.² The incidence for second stage cesarean section is reported to be 16% by the same study. Another study reported incidence of 18% for emergency cesarean deliveries.³ Factors known to be associated with impacted fetal head at cesarean births are

oxytocin use for augmentation of labor, full cervical dilatation, fetal head at low station, moulding and presence of caput. An over diagnosis of condition by junior surgeons is also common. Impacted fetal head is known to be associated independently with high maternal and perinatal morbidity.⁴

Different techniques are adopted to deliver fetal head in the event of presumed difficulty. The two widely used techniques are reverse breech extraction and vaginal head push up method. Other techniques used, include a specially designed inflatable balloon to raise baby's head, use of tocolytics and Patwardhan's technique and also use of two or more techniques together.⁵ Evidence predominantly supports use of reverse breech extraction technique for maternal benefit. This is associated with reduced incidence of extension of uterine incision, lesser operative blood loss and reduced need for blood transfusions.^{6,7,8,9} The evidence for optimal method in terms of perinatal outcome is inconclusive. The objective of

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current study was to compare perinatal outcomes of reverse breech extraction technique and head push up technique. As different studies have reported different outcomes and there is still confusion to as which techniques is better in terms of better perinatal outcome, hence the current study was planned to find out and share our experience of the two techniques.

Materials and Methods:

This comparative cross-sectional study was conducted in the OBGYN department of medical teaching institute, Lady Reading hospital, Peshawar after taking ethical approval from hospital ethical review board(Ref: No.1039/LRH/MTI). The study was conducted over a period of 3 years' time from 1st Feb, 2019 till 31st Jan 2022. Non probability consecutive sampling technique was employed for recruitment in to the study. Sample size of n=170 was calculated by taking percentage of low APGAR score of 8.3% in reverse breech extraction compared to 21.9% in standard head push technique.⁹ Patients with alive fetus, cephalic presentation, undergoing second stage cesarean sections with deeply impacted fetal head and with baby delivered either via push up technique or reverse breech extraction technique were included in the study. Women with multiple gestation, fetal anomalies, gestation less than 37 weeks, pathological CTGs, ruptured uterus, medical conditions were excluded from study. Women were divided in to two equal groups based on the technique of fetal delivery. Patients with conventional method were classified as Group I and those with reverse breech extraction were categorized into Group II.

Data regarding age, parity of women, APGAR score at delivery, fetal injuries, NICU admission, neonatal deaths were collected on pre designed proformas. Other factors like presence of uterine incision extension, postpartum hemorrhage, blood transfusion, visceral injury, duration of hospital stay, wound infection was also recorded.

Table III: Stratification of LowApgar score at 5 minutes with respect to age, gestational age, parity and BMI.

		Group II (n=85) Apgar score <7 at 5 minutes		Group I (n=85) Apgar score <7 at 5 minutes		P-value
		Yes	No	Yes	No	
Age	18-30 Years	11	46	12	39	0.592
	31-40 Yrs.	02	26	14	20	0.002
Gestationa l Age	37-39 wks	06	29	09	20	0.192
	40-41 wks	07	43	17	39	0.045
Parity	Primiparous	08	34	05	20	0.924
	Multiparou s	05	38	21	39	0.007
BMI	< 27	01	18	09	13	0.008
	>27	12	54	17	46	0.217

Data was analyzed on SPSS version 25.0. Frequencies and percentages were estimated for qualitative variables like

APGAR score less than 7, fetal injuries, NICU admission, neonatal death, uterine incision extension, postpartum hemorrhage, blood transfusion, visceral injuries, wound infection. Mean and standard deviations were computed for age, duration of hospital stay. Chi square test was applied to

see associations of perinatal outcomes with techniques for fetal delivery.

Table II: Comparison of Perinatal Outcomes in two groups

Perinata l Outcom es	Group II (n=85) Apgar score <7 at 5 minutes		Group I (n=85) Apgar score <7 at 5 minutes		P- valu e
	YES	No	Yes	No	
Low APGAR score	13 (15.29 %)	72 (84.71%)	26 (30.59%)	59 (69.41 %)	0.01 8
NICU admissi on	20 (24%)	64 (76%)	32 (38.0%)	52 (62%)	0.06 6
Early neonata l death	03 (4%)	81 (96%)	05 (6%)	79 (94%)	0.71 9

Results:

The minimum age of study population was 18 years and maximum of 40 years with mean age of 29.66± 4.41. There were 49 % primiparas in Group II and 29% in Group I. Overall,

Table I: Demographic characteristics of sample

Patient's Characteristics	Frequencies	Percentages
Age(years)		
18-30	108	63.5%
31-40	62	36.5%
Gestational Age(weeks)		
37-39	64	37.6%
40-41	106	62.4%

there were 39 % primiparas and 61% multiparas in the study. The gestational age range was from 37 to 41 weeks with mean gestational age for study sample of 39.42 ± 1.37.

In group II women 13 (15.29%) babies were delivered with low APGAR score at 5 minutes, while In Group I ,26(30.59%) babies had low APGAR score(p=0.018). Neonatal Intensive care admission rate for Group II was 24%, and 38.0% for Group I (p=0.066). There was no statistically significant difference between two groups for early neonatal deaths 4%vs 6% (p=0.719). Table II.

Low APGAR score when stratified with respect to mother's age, parity and body mass index showed statistically significant differences for higher maternal age group, higher gestational age group, multiparity and low BMI. (Table III)

Discussion

The current study comparing reverse breech extraction technique with conventional head push techniques shows encouraging neonatal outcome with regard to reduced rates of low APGAR scores at 5 minutes of birth. No difference for NICU admission and early neonatal death were observed in current study. A highly skillful technique supported by sound evidence during second stage cesarean sections is the need of the day in the view of progressively rising cesarean section rates. Although the available evidence shows promising maternal outcomes with reverse breech extraction, the optimal mode of delivery in terms of perinatal outcome is debatable. In a Swiss study done, no statistically significant

differences were found between two methods of fetal delivery during cesarean section at full dilatation for outcomes of umbilical artery pH of <7.15, APGAR score at 5 minutes of <7, NICU admissions and perinatal deaths.⁷ There were two cases of perinatal skull fractures, with one ending in neonatal death, with head push technique.

The findings of current study are similar to another study done previously, where APGAR score <7 at 5 minutes was seen in 8.3% neonates in the reverse breech extraction group and in 21.9% of standard head push approach group (p=0.015).¹⁰ Similarly in a systematic review done by Amelia and colleagues, risks of uterine incision extension, transfusions, visceral injuries, NICU admissions and low APGAR score were significantly higher with push method in comparison to reverse breech extraction method.⁶

In an Indian study, no significant difference was found between the two methods in terms of NICU admission. The NICU admission rate was found to be 20.27% in pull versus 17.56% in conventional method group (p=0.834). Low APGAR scores, seizures and neonatal injuries also did not show any statistically significant difference between the two groups.¹¹ A systematic review by Maria and colleagues showed that pull technique carries lower fetomaternal risks compared to push technique.¹² In a systematic review of various techniques for assisting difficult delivery at cesarean section, no difference for average APGAR score was seen for the two methods, however the NICU admission rate were decreased (RR 0.53, 95%CI 0.23 TO 1.22) with reverse breech extraction technique. Also, there was no difference for outcome of neonatal birth trauma.¹³ Another study done by Moran Gil et al, reported no differences in neonatal outcomes between two groups.¹⁴

The diagnosis of a truly impacted head requiring additional maneuvers or assistance at delivery is subjective. The current study had a large sample size; however, biases may be present because certain factors were not accounted for like, the heterogeneity of condition, experience, skills of operating surgeons and a combination of techniques used.

Conclusion: Reverse breech extraction technique has the advantage over conventional head push technique in term of reduced rates of low APGAR scores at 5 minutes of birth.

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