ORIGINAL ARTICLE

REVERSE BREECH EXTRACTION VS HEAD PUSHING FOR DELIVERY OF DEEPLY IMPACTED FETAL HEAD IN EMERGENCY CAESAREAN SECTION

Naila Tahir, Ghana Shahid, Muhammad Adil, Sadia Fatima
HOD Gynae/Obst. CMH Abbottabad, PAF Quetta-Pakistan

Background: Obstructed labour is considered a negligible component of maternal mortality in developed countries but it is a major mortality burden in developing countries. This study was done to compare maternal outcome associated with reverse breech extraction and vaginal head pushing method for the deeply impacted foetal head in emergency caesarean section. **Methods:** It was done at the Department of Obstetrics and Gynaecology Military Hospital, Rawalpindi from May to Nov 2014. A total of 110 patients meeting our inclusion criteria were randomly divided into two groups, i.e., Group A (delivered by reverse breech extraction) and Group B (delivered by hand push method). Patient demographic data and maternal outcomes were compared among both groups. Data was analysed using SPSS-21. **Results:** Mean age of the patients was 27.51±6.60 and 27.91±6.85 years in Group-A and B respectively with an age range of 15–45 years while the mean gestational age was 39.93±0.87 weeks and 40.05±0.62 weeks in Group A and B respectively. 27 (49.1%) from Group A and 26 (47.3%) from Group B were primigravida. Extension of uterine incision was observed in 5 (9.1%) patients of group-A and 25 (45.5%) patients of group-B. Mean operative duration was 42.47±3.00 min and 51.73±2.14 min in Group A and B respectively. More blood loss was observed in Group-B when compared with Group-A (1542.36±188.27 ml vs 1090.36±130.08 ml). A statistically significant difference was seen in both groups regarding maternal outcomes (p<0.001). **Conclusion:** Reverse breech extraction for delivery of deeply impacted foetal head during the emergency caesarean section is a safe and quick technique as compared to the push method.

Keywords: Reverse breech extraction; Vaginal head pushing; Caesarean section; Obstructed labour

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INTRODUCTION

Over the last few years, there has been observed a marked decline in the global burden of maternal mortality. Obstructed labour (OL) is considered a negligible component of maternal mortality in developed countries but it is a major mortality burden in developing countries.[1] About 8% of maternal mortality in developing countries is attributed to OL.[2] However, there is great variation in the worldwide incidence of OL, varying from as low as 0.8% to as high as 12.2%.[3] In Global Burden of Disease (GBD) 1990, OL was ranked 41st, accounting for 0.5% of all conditions and 22% of all maternal conditions.[2] It is one of the major causes of hospitalization accounting for 39% of all obstetric patients in resource-poor countries and is one of the three foremost causes of perinatal mortality having case fatality rate of 87–100%.[2,4]

Obstructed labour is the condition in which the presenting part fails to descend into the birth canal despite strong uterine contractions due to some mechanical obstruction.[5] It is an extremely serious condition and is associated with high rates of mortality and morbidity for both the mother and the neonate. Mothers in OL are in great pain, fear, and anxiety.[6] Usually, interruption at the level of pelvic brim causes obstruction but occasionally obstruction may occur in the pelvic cavity or pelvic outlet. Cephalopelvic disproportion (CPD), defined as the disparity between foetal head and maternal pelvis, is considered the most common cause of OL, followed by foetal malpresentation and malpositioning.[7] Rarely, locked twins and pelvic tumours may be the cause of the obstruction.[8] Besides, multiple other factors that contribute to the impaction of the foetal head have been identified, including reluctance on the part of the clinician to intervene during the prolonged second stage of labour, delivery trials using instruments, use of epidural anaesthesia, and malpositioning of foetal head.[9] Whatever the cause, OL is always associated with complications like intrauterine infections, bladder, or rectal trauma due to persistent foetal head pressure, uterine rupture leading to haemorrhage and obstetric fistula. Serious chronic complications include vesico-vaginal and recto-vaginal fistulae.[10]

When unanticipated obstruction occurs, which usually happens in the second stage of labour making normal vaginal birth difficult, an emergency

caesarean section is performed. About 25% of emergency caesarean deliveries are performed in the second stage of labour.[10] This high rate is due to the failure of instrumental delivery and the fact that most patients consider caesarean a safer option.[11] In the advanced second stage of labour, however, the emergency caesarean section is difficult because of the deep impaction of the foetal head and the risk of complications for both the foetus and the mother increases.[12] Maternal complications include uterine incision extension, uterine artery injury, broad ligament hematoma, increased risk of postpartum haemorrhage, and at times difficulty in delivering foetal head. Foetal complications include poor APGAR score, injuries, and intensive care need.[13] Different techniques have been introduced and modified to overcome a difficulty in delivering and to reduce complications. These include the head push technique, i.e., pushing through the vagina, reverse the breech technique, and the Patwardhan technique, i.e., shoulder-first technique.

Over time, different studies and trials have been conducted to compare head push technique and reverse breech extraction. We conducted a similar study at our setting to compare both techniques in terms of outcomes to not only improve the management of patients but to also inculcate a culture of evaluation of our practices.

MATERIAL AND METHODS

This was a randomized controlled trial (RCT) and was conducted at department of Obstetrics and Gynaecology, Military Hospital, Rawalpindi from May to Nov 2014 (over a period of six months). A total of 110 patients aged 15–45 years, who developed OL with singleton pregnancy and cephalic presentation, and were at $\geq$ 37 weeks of gestation (calculated by the date of last menstrual period or ultrasonography performed in early first trimester), and required abdominal delivery were included in the study. Exclusion criteria included multiple pregnancies, non-cephalic presentation, previous caesarean section scar and preterm labour. Patients were selected by non-probability consecutive sampling. Informed written consent was obtained from all the patients. The sample size was calculated by using WHO sample size calculator taking: Power of study as 90%, Level of significance as 5% with Anticipated population proportion: P1 = 50% and P2 as 17.2%.[14,20]

Block randomization was used to assign patients into groups. One group (Group A) was delivered by reverse breech extraction method and the other (Group B) by head pushing method. Each group contained 55 patients. Reverse breech extraction was performed by giving a high transverse incision over the lower stretched uterine segment where loose fold of visceral peritoneum is attached, at the level of the anterior shoulder of the baby. In the head push technique, an assistant pushed the foetal head vaginally while the surgeon tried to dislodge the head from the pelvis by passing a hand below the head. A single dose of Ceftriaxone 1gm IV was given prophylactically to all women before the incision. All caesarean deliveries were performed under spinal anaesthesia. Ethical approval was taken from Hospital Ethical Committee before start of study.

Patient's data including demographic information, gestational age, parity, maternal complications in terms of extension of the uterine incision, blood loss and operation duration were recorded on pre-designed proforma. Blood loss was estimated by an OT staff at the end of the operation by the amount of blood collected in suction bottle. Duration of the operation from the time of skin incision to the last suture of skin was noted by the first assistant (postgraduate trainee). All data was analysed using SPSS IBM software. Means and standard deviations were calculated for all numerical variables in the study like age, parity, gestational age, duration of operation and blood loss. Frequency and percentages were calculated for all categorical variables like extension of the uterine incision. Independent sample t-test was applied to compare mean operative duration and mean blood loss in both groups. Chi square test was applied to compare uterine incision extension between both groups. The p-value <0.05 was considered significant.

RESULTS

A total of 110 patients (55 patients in each group) were included in this study during the study period. Group-A was delivered by reverse breech extraction method while group-B by head pushing method. Mean age was 27.51±6.60 and 27.91±6.85 years in group-A and B respectively with age range of 15–45 years. Mean gestational age was 39.93±0.87 weeks and 40.05±0.62 weeks in Group A & B respectively. In Group-A, 27 patients (49.1%) and in Group-B 26 patients (47.3%) were primigravida. Table-1 shows age group, gestational age and gravidity of all the patients.

Maternal outcomes were assessed in terms of uterine incision, operative duration and blood loss. Extension of uterine incision was observed in 5 (9.1%) patients and 25(45.5%) patients in Group A and B respectively. There was statistically significant difference between two groups (p<0.001). Mean operative duration was 42.47±3.00 minutes in Group A while 51.73±2.14 minutes in Group B. Statistically significant difference was found between the two groups (p<0.001). More blood loss was observed in Group-B when compared with Group-A [1542.36±188.27 vs 1090.36±130.08 (ml)]. The difference was statistically significant. Table-2 compares uterine incision extension, operative duration and blood loss between Group A and B.

Table-1: Baseline characteristics

	Group A		Group B	
	n (%)	Mean±SD	n (%)	Mean±SD
Age (Years)				
15–25	24 (43.6%)		26 (47.3%)	
26–35	25 (45.4%)	27.51±6.60	22 (40.0%)	27.91±6.85
36–45	6 (11.0%)		7 (12.7%)	
Gestational age (weeks)				
38–39	19 (34.5%)	39.93±0.87	7 (12.7%)	40.05±0.62
40–41	36 (65.5%)		48 (87.3)	
Parity				
Primigravida	27 (49.1%)		26 (47.3%)	
Multigravida	28 950.9%)		29 (52.7%)	

Table-2: Maternal outcome comparison

	Group A	Group B	*p*-value
Extension of uterine incision			<0.001
Yes n (%)	5 (9.1%)	25 (45.5%)	
No n (%)	50 (90.9%)	30 (54.5%)	
Mean operative duration (min)±SD	42.47±3.00	51.73±2.14	<0.001
Mean blood loss (ml)±SD	1090±130.08	1542.36±188.27	<0.001

DISCUSSION

Normal vaginal birth is always the preferred method of delivery for both mother and her clinician. During labour, however unanticipated OL often ends up in delivering the foetus by abdominal route. Emergency caesarean section is performed for deeply impacted foetal head to alleviate obstruction which is one of the reasons for increasing rate of emergency caesarean section. Second stage caesarean delivery needs a lot of expertise and it still tests the surgical skills of obstetrician to an extent. Prolonged second stage of labour is associated with increased risk of trauma to uterus, uterine infections and haemorrhage.[14] Lengthened second stage of labour leads to thinning of lower segment of uterus because of pressure of foetus.

This ultimately increases the chances of cervical lacerations and uterine incision extension during operative delivery which affects future obstetric of the women. Lateral extension of incision may injure uterine artery or uterine venous plexus resulting in haemorrhage. Similarly, vertical downward extension may damage cervical arteries and vaginal venous plexuses.[15] Similarly baby outcome is also compromised because of difficult foetal delivery resulting in increased morbidity and mortality. In literature various techniques have been studied and trailed to overcome these risks. The reverse breech extraction and push method are the most commonly exployed techniques.[16] In this comparative study we compared the two techniques in terms of maternal outcome.

In our study there was no significant difference between the two groups regarding age and parity which is consistent with findings described by Levy *et al*.[17] Majority of the patients in our study were in gestational age period 40-41 weeks. According to Bairwa *et al*, majority of patients (56%) in their study were in the gestational age range of 37–40 weeks.[18]

In our study reverse breech extraction was associated with reduced maternal complications which have been reported in different studies and clinical trials. Jeve *et al* performed a meta-analysis of techniques to deliver deeply impacted foetal head and concluded that reverse breech extraction is safer and faster than push method.[19] In our study, extension of uterine incision was observed in 5 (9.1%) patients in Group A and in 25 (45.5%) patients in Group B. This finding is consistent with various studies.[6,14,18,20,21] Extension of uterine incision is possibly due to iatrogenic trauma caused by surgeon pushing foetus from below and overuse of force to uplift deeply impacted head out of pelvis.[10] A significant difference was observed in both groups which was consistent with the findings reported by by Frass *et al*[17] ($p<0.001$) and H.S.Saleh *et al*[22] ($p<0.05$).

In our study, mean operative duration for reverse breech extraction (42.47±3.0 min) was shorter than for head push method (51.73±2.14 min). Bastani *et al*[20], Fasubaa *et al*[21], Frass *et al*[18] and Veisi *et al*[14] had similar findings. A significant difference between both groups was present in our study as stated by these authors ($p<0.001$). We found that pull method was associated with lesser blood loss as compared to push method. Chopra S

et al[23], Baloch S *et al*[24] and Lenove Kj *et al*[25] also had similar findings.

In Pakistan, it has been observed that a large proportion of patients with OL were unbooked. It's because majority lives in rural areas, with limited health care available, high illiteracy rate, unplanned family and malnutrition. As a result, large number reaches hospital with OL.[26] Also our society is caught up in primitive traditions, early age marriages ultimately leading to teenage pregnancies. Adolescent pregnancies having different reproductive needs often ends up in obstetric emergencies like OL.[27]

Because of advancement in technology, healthcare delivery and care system has shown tremendous improvement. But still there is lack of technology and experienced staff. It is time to consider well designed and well-equipped training especially for junior doctors to develop essential skills to use different techniques.

CONCLUSION

Reverse breech extraction for delivery of deeply impacted foetal head during emergency caesarean section is associated with decreased risk of uterine incision extension, minimal operative duration and lesser blood loss during operation as compared to push method. It also avoids the need for vaginal route foetal head pushing and hence possible ascending infections. It is, therefore a safer and quicker approach to be considered.

Conflict of interest: This study has no conflict of interest to declare by any author.

AUTHORS' CONTRIBUTION

NT: Conceptualization, data collection, proof reading. MA: Article drafting, literature search. GS: Literature search. Article drafting, data collection. SF. Data collection, proof reading, literature search.

REFERENCES

1. Wells JC. The New "Obstetrical Dilemma": Stunting, Obesity and the Risk of Obstructed Labour. Anat Rec (Hoboken) 2017;300(4):716–31.
2. Usharani N, Bendigeri M. A study on clinical outcome of obstructed labour. Int J Reprod Contracept Obstet Gynecol 2017;6(2):439.
3. Ahmed Y, Solomon L, Girma A. "Prevalence and Management Outcome of Obstructed Labor among Mothers Who Gave Birth Between January, 2013 and December, 2015 in Metu Karl Referal Hospital, Ilu Ababora Zone, South West Ethiopia". EC Gynaecology 2017:4(4):126–33.
4. Mekbib T, Kassaye E, Getachew A. FIGO Save the mothers Initiative. Ethiopia-Sweden Collaboration. Int J Gynaecol Obstet 2003;81(1):93–102.
5. Ukke GG, Gudayu TW, Gurara MK, Amanta NW, Shimbre MS. Feto-maternal outcomes in obstructed labor in Suhul General Hospital, North Ethiopia. Int J Nurs Midwifery 2017;9(6):77–84.
6. Kadhum TJ. Head pushing versus reverse breech extraction for delivery of impacted fetal head during Cesarean section. Kufa Med J 2009;12(1):200–5.
7. Nwogu-Ikojo EE, Nweze SO, Ezegwui HU. Obstructed labour in Enugu, Nigeria. J Obstet Gynaecol 2008;28(6):596–9.
8. Swaroop N, Sharma P, Kumari K, Seth S. Obstructed labour caused by rare congenital anomaly of foetus: managed by foetal abdominal tapping leading to successful vaginal delivery. Int J Reprod Contracept Obstet Gynecol 2017;4(4):1220–2.
9. Chopra S. Disengagement of the Deeply Engaged Fetal Head during Cesarean Section Conventional Method versus Reverse Breech Extraction- Review of Literature. Clin Mother Child Health 2016;13(2):1000239.
10. Randhawa A, Singh D, Kapoor D. Impact of Surgical Techniques in Maternal Morbidity and Foetal Outcome in Obstructed Labour: A Retrospective Study of 100 Cases of Obstructed Labour. J Dent Med Sci 2016;15(7):23–8.
11. Ziyauddin F, Hakim S, Khan T. Delivery of the deeply engaged fetal head during cesarean section in advance labor: a comparative study of head pushing versus reverse breech extraction. Curr Pediatr Res 2013;17(1):41–3.
12. Asıcıoglu O, Güngördük K, Yildirim G, Asıcıoglu B, Güngördük Ö, Ark C, *et al*. Second-stage vs first-stage caesarean delivery: Comparison of maternal and perinatal outcomes. J Obstet Gynaecol 2014;34(7):598–604.
13. Alexander J, Leveno K, Rouse D, Landon M, Gilbert S, Spong C, *et al*. Comparison of Maternal and Infant Outcomes From Primary Cesarean Delivery During the Second Compared With First Stage of Labor. Obstet Gynecol Surv 2007;62(8):497–8.
14. Veisi F, Zangeneh M, Malekkhosravi S, Rezavand N. Comparison of "push" and "pull" methods for impacted fetal head extraction during cesarean delivery. Int J Gynecol Obstet 2012;118(1):4–6.
15. Berhan Y, Berhan A. A meta-analysis of reverse breech extraction to deliver a deeply impacted head during cesarean delivery. Int J Gynecol Obstet 2013;124(2):99–105.
16. Frass KA, Al Eryani A, Al-Harazi AH. Reverse breech extraction versus head pushing in cesarean section for obstructed labor. A comparative study in Yemen. Saudi Med J 2011;32(12):1261–6.
17. Levy R, Chernomoretz T, Appelman Z, Levin D, Or Y, Hagay Z. Head pushing versus reverse breech extraction in cases of impacted fetal head during Cesarean section. Eur J Obstet Gynecol Reprod Biol 2005;121(1):24–6.
18. Bairwa R, Garg GS, Agrawal M, Chittora SP. Delivery of baby in obstructed labour by patwardhan technique-an observational study. Education (ASME) 2016;3(2):132.
19. Jeve Y, Navti O, Konje J. Comparison of techniques used to deliver a deeply impacted fetal head at full dilation: a systematic review and meta-analysis. BJOG 2015;123(3):337–45.
20. Bastani P, Pourabolghase S, Abbasalizadeh F, Motvalli L. Erratum to "Comparison of neonatal and maternal outcomes associated with head-pushing and head-pulling methods for impacted fetal head extraction during cesarean delivery" [Int. J. Gynecol. Obstet. 118 (2012) 1-3]. Int J Gynecol Obstet 2012;119(3):292.
21. Fasubaa OB, Ezechi OC, Orji EO, Ogunniyi SO, Akindele ST, Loto OM, *et al*. 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;22(4):375–8.
22. Saleh H, Kassem G, Mohamed M, Ibrahiem M, El Behery M. Pull Breech out versus Push Impacted Head up in Emergency Cesarean Section: A Comparative Study. Open J Obstet Gynecol 2014;4(6):260–5.
23. Chopra S, Bagga R, Keepanasseril A, Jain V, Kalra J, Suri V. Disengagement of the deeply engaged fetal head during

cesarean section in advanced labor: Conventional method versus reverse breech extraction. Acta Obstet Gynecol Scand 2009;88(10):1163–6.
24. Baloch S, Khaskheli M, Khushk IA, Sheeba A. Frequency of second stage intervention and its outcome in relation with instrumental vaginal delivery versus caesarean section. J Ayub Med Coll Abbottabad 2008;20(1):87–90.
25. Leveno K, Nelson D, McIntire D. Second-stage labor: how long is too long? Am J Obstet Gynecol 2016;214(4):484–9.
26. Khan S, Roohi M. Obstructed Labour. The Preventable Factors. J Pak Med Assoc 1995;45:261–2.
27. Shaikh S, Shaikh A, Shaikh S, Isran B. Frequency of Obstructed Labor in Teenage Pregnancy. Nepal J Obstet Gynaecol 2013;7(1):37–40.

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Address for Correspondence:
Naila Tahir, HOD Gynae & Obs. Combined Military Hospital Abbottabad-Pakistan
Email: Dr-Naila@hotmail.com