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RESEARCH ARTICLE
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"COMPARISON OF PULL BREECH OUT AND PUSH IMPACTED HEAD UP TECHNIQUES USED TO DELIVER A DEEPLY IMPACTED FOETAL HEAD AT FULL DILATATION IN EMERGENCY CAESAREAN SECTION"

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Abstract

Background: Caesarean section (CS) is among the most common significant procedures in obstetrics. A range of techniques is employed to assist in the extraction of an impacted fetal head (IFH) during emergency CS. This study aimed to compare pull breech extraction and push strategies for delivering a profoundly engaged infant at full dilation during emergency cesarean sections.

Materials and Methods: This randomized clinical trial (RCT) was conducted in the department of gynecology and obstetrics at Holy Family Hospital, Rawalpindi. Sixty-two women, aged 18-40 years, having obstructive labour requiring CS were included in the study. Women with a prior uterine scar were eliminated. Women in group A (n = 31) underwent delivery with reverse breech extraction, whilst those in group B (n = 31) were delivered using the head push approach. Outcome measures comprised surgical duration, uterine incision extension, and hemorrhage volume.

Results: Women who participated in this study were aged 30.16 ± 4.95 years in group A and 30.48 ± 4.65 years in group B. Average period of gestational age was 39.34 ± 1.62 weeks. Operative duration for group A (reverse breech extraction group) and group B (head push method group) was 57.52 ± 6.69 minutes and 69.90 ± 9.32 minutes respectively (p-value = 0.0001). Blood loss measured as the 593.58 ± 92.12 ml in group A while group B experienced 996.01 ± 105.98 ml hemorrhage (p-value = 0.0001). The rate of extended uterine incision reached 6.45% in group A while group B experienced 25.81% (p-value = 0.035).

Conclusion: Pull breech out method is superior push technique for delivering a deeply IFH at full dilatation in emergency CS.

Key Words: pull breech extraction, caesarean section, impacted foetal head, uterine incision, push impacted head up

INTRODUCTION

Caesarean section (CS) is one of the most frequent major interventions in the obstetrics. Rate of caesarean section (CS) has significantly increased worldwide, accounting for 21.1% all live births[1] – crossing the acceptable CS rate set by WHO i.e., 10-15%.[1,2] Additionally, if CS rate continues to increase with the same pace, it is estimated that 38 million women would be delivering via CS in 2030.[3] Although CS is a life-saving obstetric intervention reducing both maternal and neonatal morbidity and mortality; however, it should only be considered when indicated as it is not without harm and may lead to several complications including bleeding, infections, future subfertility, and risk of uterine rupture, placenta previa, and still birth. [4,5]

An impacted foetal head (IFH) during CS may complicate the foetal delivery. The literature reveals that IFH complicates one in ten unplanned caesarean deliveries while two in hundred fetuses die or seriously injured.[6] Clinicians employ different techniques for handling IFH during full dilation and rely mostly on "reverse breech extraction" and "head push method."[7] The reverse breech extraction method, often known as the "pull technique," entails the operator seizing and drawing the legs to aid in the delivery of the buttocks, abdomen, and ultimately the head.[8] An assistant puts vaginal pressure on the fetal head during the head push technique which allows the surgeon to push underneath the head to move it out of the pelvic area.[9]

Although both the techniques are commonly adopted by the surgeons; however, there is lack of consensus on which one is better than the other. Therefore, this randomized controlled trial was conducted to compare reverse breech extraction and head push method in terms of operative time, loss of blood and uterine incision extension. This study is a useful addition to literature which help reach a consensus that which technique should be preferably employed while dealing with IFH at full dilatation during CS.

MATERIALS & METHODS

This RCT was executed in the department of obstetrics and gynecology at Holy Family Hospital, Rawalpindi, from March 10, 2018, to September 9, 2018. The Institutional Research Forum of RMC at Holy Family Hospital Rawalpindi approved the study. Following the acquisition of informed consent, 62 pregnant women were incorporated into the study, evenly divided into two groups A and group B with 31 patients in each group. The inclusion criteria comprised women aged 18-40 years with obstructed labor necessitating cesarean section, any parity, singleton term pregnancy (more than 37 weeks as determined by ultrasound), cephalic presentation on ultrasound, and advanced labor characterized by cervical dilation of 7 cm or greater, with deeply engaged fetal head in the maternal pelvis upon clinical examination. Exclusion criteria encompassed a prior uterine scar documented in the medical history. Women in group A underwent delivery via reverse breech extraction, whereas those in group B were delivered using the head push approach. All procedures were carried out under the direct supervision of a qualified supervisor. The reverse breech extraction procedure involved making a high transverse incision over the distended lower uterine segment, positioned at the anterior shoulder of the fetus due to the significant impaction of the head. After the incision, the anterior shoulder emerged on its own, allowing the surgeon to insert a hand or two fingers into the uterine cavity to assess the positioning of the anterior foot. Following the stabilization of the foot, traction was applied alongside fundal pressure to aid in the delivery of the foot, succeeded by the entire lower limb, the contralateral limb, trunk, and head from the cavity. The head push procedure entails an assistant exerting pressure on the fetal head vaginally, while the surgeon positions their hand beneath the head to extricate it from the pelvis. The angles of the uterine incision were stabilized with clamps. The evaluation included outcome measures such as the duration of surgery, the extent of uterine incision extension, and the amount of blood loss. All information was meticulously recorded in specially designed proformas. The analysis was conducted using SPSS 22. Quantitative variables

including age, gestational age (in weeks), duration of the surgical procedure (in min.), and volume of blood loss (in ml) were reported as mean ± standard deviation. Frequencies and percentages were employed to illustrate the equivalence and the expansion of the uterine incision. The Chi-square test was employed to analyze the differences in the extent of uterine incision between the two groups. An independent samples t-test was performed to assess the surgical duration and blood loss across the two groups in the study. A p-value ≤ 0.05 considered statistically significant.

RESULTS

The mean age of women included in group A and group B was 30.16 ± 4.95 years and 30.48 ± 4.65 years, respectively. Gestational age ranged from 37 to 42 weeks with mean gestational age of 39.34 ± 1.62 weeks. The mean gestational age in group A and group B was 39.19 ± 1.56 weeks and 39.48 ± 1.69 weeks, respectively. In terms of parity, 37 (59.68%) and 25 (40.32%) women undergoing CS were multiparous and primiparous, respectively. The mean BMI in group A and group B was 28.68 ± 2.51 kg/m2 and 28.97 ± 2.27 kg/m2, respectively. The sociodemographic variables are presented in table 1. Mean operative time in group A (reverse breech extraction group) and group B (head push method group) was 57.52 ± 6.69 minutes and 69.90 ± 9.32 minutes, respectively (p-value = 0.0001). Mean blood loss in group A and group B was 593.58 ± 92.12 ml and 996.01 ± 105.98 ml, respectively (p-value = 0.0001). Extension of uterine incision was required in 02 (6.45%) and 08 (25.81%) patients in group A and group B, respectively (p-value = 0.035). Outcome variables of significance are presented in table 2 and figure 1.

Table 1: Sociodemographic variables of the patients (n = 62; 31 in each group)

Variables		Group A n (%)	Group B n (%)	Mean ± SD
Age (Years)	18-30	15 (48.39%)	15 (48.39%)	30.32 ± 4.77
	31-40	16 (51.61%)	16 (51.61%)	
Gestational Age (Weeks)	37-39	19 (61.29%)	15 (48.39%)	39.34 ± 1.62
	40-42	12 (38.71%)	16 (51.61%)	
BMI (kg/m^2)	≤ 27	10 (32.26%)	12 (38.71%)	28.82 ± 2.38
	> 27	21 (67.74%)	19 (61.29%)	

Table 2: Outcome variables of significance

Variable	Group A (Mean)	Group B (Mean)	p-Value
Operative Time (minutes)	57.52 ± 6.69	69.90 ± 9.32	0.0001
Blood Loss (millilitres)	593.58 ± 92.12	996.01 ± 105.98	0.0001

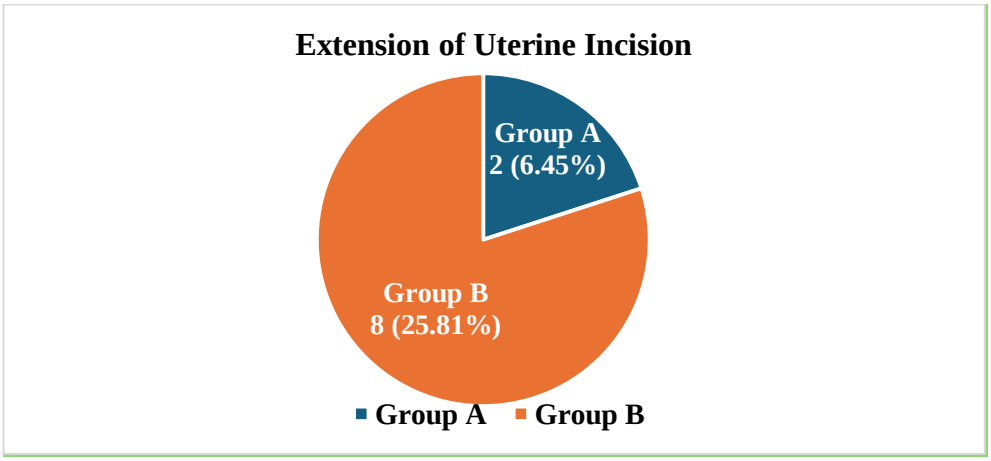

Figure 1: Frequency of extension of uterine incision required in both study arms

DISCUSSION

This RCT was conducted to compare reverse breech extraction (pull breech out) and head push technique to deliver a deeply IFH at full dilatation in emergency CS. The study revealed that reverse breech extraction or pull breech out technique was superior to head push technique for delivering a deeply IFH at full dilatation in emergency CS in terms of operative time, blood loss and extension of uterine incision. Hence, pull breech out technique seems more acceptable than head push method.

The literature divulges that IFH complicates 16% of during the second stage of CS.[9,10] Several techniques are used to manage IFH during Caesarean delivery including uterine relaxation via tocolytics, abdominal cephalic disimpaction, vaginal push method, reverse breech extraction and Patwardhan method.[8,11] The present study compared only the two methods (vaginal push method vs. reverse breech extraction) and favoured the reverse breech extraction technique. Lenz et al.[10] conducted a retrospective cohort study to compare reverse breech and head push technique to handle deeply impacted head of foetus including 629 women at term with singleton pregnancy in a tertiary care hospital in Switzerland. They reported that reverse breech method was superior to head pushing technique in terms of shorter operative time (38.3 ± 18.4 vs. 44.8 ± 16.7 minutes; p = 0.006), fewer extension of uterine incision rate (9.1% vs. 35.4%; p = <0.001) and less blood loss during surgery (562.7 ± 195.1 vs. 712.2 ± 375.0 ml; p = 0.009). Hence, this study put forth the same findings as in the present study, supporting the reverse breech technique to handle IFH.

Similarly, Elshamy, Sharaf and Shaeen[6] conducted retrospective observational study including 152 women undergoing CS, at Menoufia University Hospital Egypt, to compare reverse breech extraction and vaginal push up technique to deliver IFH in fully dilated cervix. They reported higher percentage of extension of uterine incision (33.3% vs. 10.7%; p = 0.002), higher mean values of operative time (41.2 ± 14.3 vs. 35.2 ± 11.3; p = 0.008) and longer mean of operative blood loss (712.2 ± 345.0 vs. 581.7 ± 232.0; 0.015) for women included in vaginal push technique. Safdar et al.[12] carried out an RCT 60 women undergoing CS at The Pakistan Ordnance Factories (POF) Hospital Wah Cantt, Rawalpindi to compare push technique and reverse breech extraction technique to manage IFH during CS. They reported lower percentage of extension of uterine incision (p = 0.015), shorter mean of operative blood loss (0.021) and lesser post-partum hemorrhage (p = 0.020) for women included in reverse breech extraction technique. Hence, all these studies support the findings of the present study in that reverse breech extraction technique for the management of IFH is superior to the vaginal push method.

A notable decrease in uterine incision extension was noted with reverse breech extraction in comparison to cephalic delivery (20% vs. 50%; p = 0.001). Additionally, operative times were shorter (59.7 ± 4.2 vs. 75.2 ± 6.1 minutes; p = 0.001), and blood loss was reduced (878 ± 67 mL vs. 1321 ± 57 mL; p = 0.001).[13] The findings are consistent with a systematic review and meta-analysis conducted by Jeve et al. (2016), which indicated that the push technique was linked to increased risks of uterine extension, infection, blood loss, and extended surgery duration when compared to reverse breech extraction.[14] Veisi et al. (2012) further corroborated these findings, indicating that the push method notably extended operative time and uterine incision length (p < 0.001). However, neonatal outcomes were similar across both methods, with the exception of a single case of femoral fracture in the pull group.[15] Tahir et al. (2020) observed that reverse breech extraction led to a lower incidence of uterine extensions (9.1% compared to 45.5%), decreased blood loss (1090.36 ± 130.08 mL versus 1542.36 ± 188.27 mL), and shorter operative times (42.47 ± 3.00 minutes versus 51.73 ± 2.14 minutes) (p < 0.001).[16] Further research supports these findings, demonstrating that the pull method results in reduced intraoperative blood loss and shorter surgery durations.[17] Postoperative complications, including wound infection and duration of hospital stay, did not show significant differences between the two techniques.[18] However, there are ongoing concerns regarding the potential for contamination due to vaginal manipulation in the push method, which may elevate infection risks.[19] Summarizing, reverse breech extraction demonstrates enhanced safety and efficiency in managing impacted fetal heads during emergency cesarean sections, reducing maternal

morbidity while maintaining neonatal outcomes. Educating obstetricians in this technique may enhance surgical outcomes, especially in environments with elevated incidences of obstructed labor. The advantages of this study are that is it is the first RCT design to compare the two techniques (pull breech out vs. head push) to deliver a deeply IFH at full dilatation in emergency CS in the region of Rawalpindi and Islamabad, and it has clearly revealed that pull breech out technique is superior to head push method. Also, this study has endorsed the findings of the pioneered study conducted by Safdar et al.[12] in the same region of Pakistan. However, this study is not without limitations including single-centred study, and bias due to confounders e.g., competency of the surgeon. Hence, the findings the study are not generalizable. So, further studies on a large scale are warranted to support the findings of this study.

CONCLUSION

In conclusion, reverse breech extraction or pull breech out technique was superior to head push technique for delivering a deeply IFH at full dilatation in emergency CS in terms of less operative time, less blood loss and less need for extension of uterine incision.

Conflict of Interest

NIL

Contribution of Authors

1. Sobia Nawaz, MBBS; FCPS: Supervised the study and corresponding author
2. Saima Bibi, MBBS; FCPS: Data collection and drafting
3. Sara Ejaz, MBBS; FCPS: Data collection
4. Toheeda Shaheen: Formatting of the article
5. Rabia Noor: Data Entry and analysis of the data
6. Nabeela Waheed: Overview and fine tuning of the article

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