

Cesarean Section of an Impacted Fetal Head at Full Cervical Dilatation – Evaluation of Patwardhan Technique

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Abstract

Background- Delivery of a deeply impacted fetal head in second stage cesarean is associated with adverse fetal and maternal outcomes.

Objective- To compare maternal and neonatal morbidities by Patwardhan technique and Hand-Push method for delivery of the impacted fetal head during cesarean section at full cervical dilatation.

Methodology- Retrospective cohort study which included 100 women admitted to J.J.M Medical College, Davangere with single fetus at term in vertex position with head deeply impacted in the pelvis that underwent second stage caesarean section with fetal head at or below the level of ischial spine from October 2018 to September 2019. In the first group all cases were extracted by Patwardhan and in the second group extraction of fetus was done by Hand-Push method.

Results- Extension of uterine incision was seen in 2% of patients in Patwardhan group as compared to 16% in Push Method. Traumatic PPH, uterine artery laceration, need for blood transfusion and hysterectomy were more in Push method. NICU admissions were comparable in both the groups. APGAR score comparison between the two methods of extraction at 1min ($p=0.015$) and at 5min ($p=0.01$) indicated that Patwardhan group showed considerable advantage over the Push method.

Conclusion- The Patwardhan technique is safer and better than the Push method during delivery of a deeply engaged fetal head in cesarean section at full cervical dilatation.

Keywords: Deeply impacted fetal head; Patwardhan's Technique; Hand-Push Method; Full cervical dilatation; Maternal and fetal outcomes

Introduction

Cesarean delivery done in second stage of labour has been steadily increasing over the past few decades and account for about one fourth of all primary cesarean sections [1]. Delivery of the impacted fetal head at full cervical dilatation poses technical challenges to the operating surgeon in terms of disengagement of the deeply engaged head by hand due to lack of space between the muscular and bony maternal pelvis and the impacted fetal head which can be further compounded by the presence of molding and caput succedaneum [2,3]. The lower segment is thinned out, edematous and hence is a major factor contributing to associated increased maternal and fetal complications [4]. Maternal morbidity is enhanced due to extension of the uterine incision, uterine artery laceration, broad ligament hematoma, increased risk of post-partum hemorrhage, infection, directed trauma to bladder or due to prolonged pressure by the fetal head, stress urinary incontinence. The most distressing long term complication is obstetrical fistulae which results from pressure necrosis due to prolonged labour caused by impaction of the presenting part against pubic symphysis [5,6]. Fetal complications include poor APGAR scores, birth injuries, admission to NICU, perinatal asphyxia, and stillbirth [7]. Various techniques have been described to overcome this difficulty to deliver the impacted fetal head during second stage caesarean section. Commonly used methods include (i) Push Method in which the fetal head is disengaged by pushing it through the vagina by an assistant either by the conventional Hand-Push method or by the newer fetal-disimpaction system—Fetal Pillow (ii) Pull Method such as Patwardhan's method (shoulder first method) or Reverse breech technique or Vectis or Murless Head Extractor. Superiority of one method over the other is questionable. Hence, this study is aimed to compare the maternal and perinatal outcomes using the Patwardhan technique and the Push Method in women undergoing caesarean section at full cervical dilatation [8].

Materials and Methods

With a level-IV Evidence, a retrospective cohort analysis of second stage caesarean section was performed at a tertiary care center, JJMC Medical College Davangere from October 2018 to September 2019 in which 100 women with comparable age, parity, duration of pregnancy, hemoglobin status, labour characteristics and baby weight were selected for the study. Inclusion criteria involved women with single fetus at term in anterior vertex position with full cervical dilatation with head deeply impacted in the maternal pelvis. Exclusion criteria-Intrauterine fetal death, congenital fetal anomaly, multiple pregnancy, Ruptured uterus, previous caesarean section, Antepartum hemorrhage, Pregnancy less than 37 weeks. Detailed history with physical examination was taken. All patients on admission were managed according to institutional protocols of conducting caesarean delivery at second stage protocol. Patients were divided into 2

groups: Group I babies were delivered by Patwardhan technique and in group II where baby delivered by Push Method. The Patwardhan technique was first described by Dr. Patwardhan. In cases with occipito-anterior position with head deeply impacted in the pelvis, an incision is made in the lower uterine segment at the level of the anterior shoulder which is delivered out. With gentle traction on this shoulder, the posterior shoulder is also delivered out. Next, the surgeon hooks the fingers through the axillae and with gentle traction, aided by fundal pressure applied by assistant, the body of the fetus is brought out of the uterus [9]. In the Push Method after opening the uterus, fetal head is pushed up by an assistant's hand introduced through the vagina. The surgeon then introduces his hand into the uterus, between the baby's head & uterine wall, to get beneath the fetal head as the assistant pushes the fetal head up from down below [10]. The surgeon then delivers the fetal head and rest of the body as in routine caesarean sections.

Statistical analysis

Data was analyzed by SPSS software (Version 24.0, IBM, Chicago, USA) and comparison between the two groups using chi-square and Students t-test, as appropriate. Mean and Standard deviation were used for explaining the data. A probability value "p" less than 0.05 was regarded as statistically significant (**Figure 1 and Figure 2**).

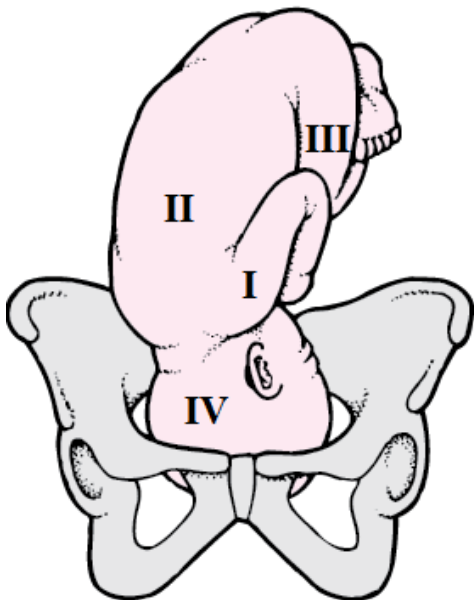


Figure 1: The Patwardhan Manoeuvre -Shoulder first method. I-Both shoulders delivered first; II- Trunk delivered by flexion; III-Both legs delivered; IV-Delivery of Head.



Figure 2: The Hand Push Disengagement Technique.

Results

During the study period a total of 8356 deliveries had occurred, out of which 5798 (69.38%) were vaginal and 2558 (30.6%) were LSCS. Of all LSCS, 128 (5.03%) were second stage caesarean section. 106 (4.23%) patients fulfilled both inclusion and exclusion criteria and 6 opted out of the study. Hence, total of 100 patients underwent second stage caesarean section of which 50 belonged to Group I (Patwardhan) and another 50 belonged to Group I (Push Method).

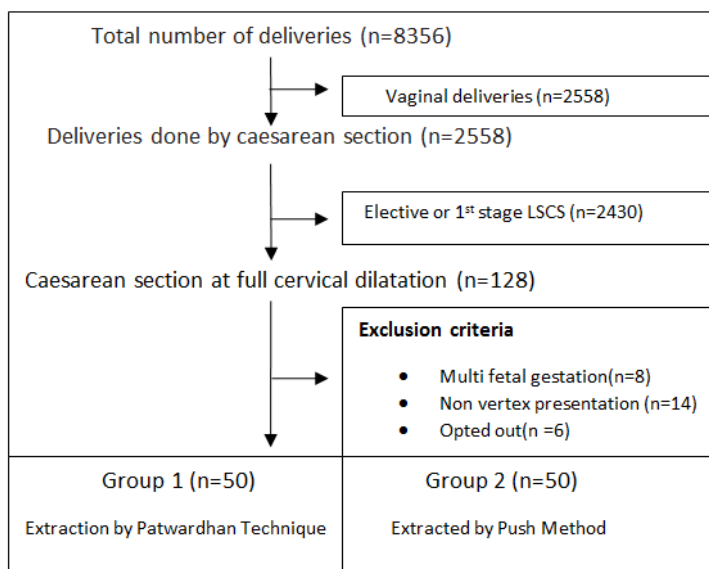


Figure 3: Flow of patients through the study.

Both the groups were statistically comparable in terms of age, married life, parity and period of gestation as has been outlined in **(Table 1)**. It was found that most of the patients were un-booked in our study.

Variables	Group I (n=50)	Group II (n=50)
	(Patwardhan Technique)	(Push Method)
	Mean± SD	Mean± SD
Age(years)	23.16± 4.21	23.78± 4.13
Married life(years)	2.38± 0.98	2.18± 0.93
Gestational Age(weeks)	38.14± 2.04	38.42±2.05
Parity	1.89± 0.54	1.98±0.67

Table 1: Demographic analysis of the patients who underwent caesarean section at full cervical dilatation.

Labour characteristics like duration of 2nd stage of labour ranged from 80-120 minutes with mean duration of 100.90 (SD ± 12.75) which was not statistically significant (p value= 0.721). Station of both groups was matched with a P value 0.170. Mean blood loss during cesarean section in Patwardhan group is statistically less than Push method, as have been described in **(Table 2)**.

Variables	Group I (n=50)	Group II (n=50)	P Value
	(Patwardhan Technique)	(Push Method)	
Station of Presenting Part before C-Section			
0 Station	16%	18%	0.17
1 st Station	32%	48%	
2 nd Station	52%	34%	
Mean Duration of Second Stage	98.3 ± 11.89	99.6 ± 12.3	0.721
Hemoglobin Level			
Hb% before surgery	9.50 ± 0.95	9.91 ± 1.28	0.075
Hb% after surgery	9.02 ± 0.71	9.42 ± 1.09	0.035

Table 2: Labour characteristics in women who underwent caesarean section during second stage of labour.

The present study showed increased incidence of uterine incision extension , uterine artery laceration and traumatic PPH being 16%,10% and 16% in Group II by Push method which were statistically significant ($p \leq 0.05$).Bilateral uterine artery ligation was performed in 2% women in Group II had to undergo obstetric hysterectomy. Blood transfusions during surgery were required in 24% patients in Group I as compared to 38% in Group II (**Table 3**).

Variables	Group I (n=50)	Group II (n=50)	P Value
	(Patwardhan Technique)	(Push Method)	
Uterine incision extension	2%	16%	0.009
Uterine artery injury	2%	10%	0.05
Traumatic PPH	4%	16%	0.005
Bladder Injury	2%	6%	0.617
Blood Transfusion	24%	38%	0.172
Atonic PPH	4%	14%	0.16
Need for Hysterectomy	0	2%	1

Table 3: Maternal morbidities.

Meconium stained liquor was statistically not significant in Patwardhan group ($p=0.056$). Mean APGAR score at 1 minute was 4.88 (SD \pm 0.867) and at 5 minute was 6.93 (SD \pm 0.807). The APGAR score comparison between the two methods of extraction at 1minute was $P=0.015$ and at 5minute was $P=0.01$, which was statistically significant which indicated that Patwardhan method had better APGAR scoring in spite of higher incidence of meconium stained liquor in Patwardhan technique as compared to Push method. Out of 68 NICU admissions in both groups were comparable ($p=0.668$). Most of the NICU admissions were due to birth asphyxia. Average stay is NICU is 5-10 days and is not statistically significant ($p=0.794$). Out of 5 neonates who had humeral fractures, 3 were by Patwardhan method and 2 were by Push Method. Fetal injuries were not statistically significant in both groups ($p=1.000$) (**Table 4**).

Variables	Group I (n=50)	Group II (n=50)	P Value
	(Patwardhan Technique)	(Push Method)	
Mean fetal birth weight	38.28 \pm 0.86	39.08 \pm 0.78	0.132
Meconium stained liquor	42%	28%	0.056
Mean APGAR Score			

1 minute	4.68 ± 0.84	5.08 ± 0.83	0.015
5 minute	6.68 ± 0.78	7.18 ± 0.74	0.01
NICU Admission			
0-2days	34%	34%	0.794
5-10days	32%	32%	
>10days	32%	32%	
Fetal injuries	6%	4%	1
Neonatal death	12%	14%	0.766

Table 4: Neonatal outcomes.

Discussion

An impacted fetal head at the time caesarean delivery is a challenging clinical scenario that has become common secondary to a decrease in conducting instrumental deliveries. Incidence of caesarean section at full cervical dilatation is 4-5% which is comparable to 5.03% in our study. A prolonged second stage of labour increases the attenuation of lower uterine segment and impaction of fetal head which gives rise to a thin, easily lacerated lower uterine segment and cervix, which is predisposed to more extensions while delivering fetal head [11]. The incidence of extension of uterine incision or intraoperative trauma in second stage caesarean sections seen in "Push" method used for extraction of fetus, has been found to be about 15% to 50% in various studies [7,10,11]. In our study the uterine extension rate was 16% by the Push method. However, there was minimal extension and trauma with the use of Patwardhan technique. The results of our study were similar to those reported in the study conducted by Khosla et al. [12] wherein no extensions had occurred when Patwardhan technique was used. Birth injuries and still birth rates were comparable in both groups in our study. Similar results were demonstrated in a study conducted by Mukhopadhyay et al. [13] and Pradip Kumar Saha et al. [5]. Babies born by second stage caesarean section have increased incidence of bith asphyxia due to prolonged second stage of labour [14].

Conclusion

The Patwardhan manoeuvre is a unique method to deliver a deeply impacted head without introducing hand into the lower uterine segment thereby preventing the associated maternal morbidity due to extension of uterine incision, lower blood loss, fewer hysterectomy and shorter operating time. Though, it requires expertise and adequate learning curve, it is considered safe

and better as compared to the conventional Push method if anticipated and done skillfully. The results derived from our study also re-enforces its advantage in preventing maternal and neonatal morbidities with minimal complications. Hence, Patwardhan technique should be implemented as a primary method in intra-operative disengagement of deeply impacted fetal head during second stage cesarean section to reduce maternal and fetal morbidities.

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