

A Comparative Study between Push and Pull Method and Patwardhan's Method in Second Stage Cesarean Section - Maternal and Fetal Outcome

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Abstract

Objective: To compare the maternal and neonatal outcomes between Patwardhan's method and push/pull method for delivery of fetus in second stage cesarean section.

Methods: This comparative study was carried out for a period of 1 year, from October 2020 to September 2021, at the PES Medical College in Kuppam, Andhra Pradesh. The study included 180 patients in total. Two groups of patients were created: group 1 was the Patwardhan's group and group 2 was the traditional push/pull group, where the baby was delivered as breech or cephalic. We evaluated the two groups in incidences of maternal complications like uterine extensions, excessive blood loss, the requirement for blood transfusions, and newborn morbidity.

Results: When compared to the push/pull group, it was found in our study that Patwardhan's group had a much lower number of cases involving uterine extensions, excessive blood loss, and blood transfusions, which reduced maternal morbidity. Neonatal results in both groups were, however, very similar.

Conclusion: Patwardhan's method is a unique method which is found to be superior and a safe for delivery of fetus in second stage caesarean sections as compared to "Push" and "Pull" methods. While neonatal complications in both the methods are almost identical maternal complications are extremely less in Patwardhan's method.

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Introduction

Modern obstetrics is becoming increasingly concerned about the rising trend of second-stage caesarean sections. This is a result of the recent decrease in the use of instrumental delivery, which has its own implications over maternal and

neonatal morbidity as well as apprehension over legal problems. [1]

Cesarean section done during second stage with fully dilated cervix and impacted fetal head is technically not easy and majority of times its associated with maternal and foetal complications. [2]

Women delivered by second stage cesarean section during their first pregnancy are found to have less chances for vaginal delivery in the subsequent pregnancies majority of them go for an elective cesarean section in order to avoid the same catastrophe which they had experienced during previous delivery. [3]

A second stage cesarean section increases the risk of injury to the lower uterine segment and nearby structures, increases the likelihood of postpartum hemorrhage and obstetric hemorrhage, injury to the bladder, extension of uterine incision, increases the risk of hematoma in the broad ligament, increases the likelihood of postoperative infections, and lengthens hospital stays. In subsequent pregnancies, there is a substantial likelihood of preterm delivery. [4]

Second-stage cesarean sections have been observed to have a greater risk of neonatal problems such hypoxemia, NICU admission, respiratory distress, infant seizures, and prolonged NICU stay. This is primarily due to the fetal hypoxia brought on by the intense uterine contractions, the significantly impacted fetal head, and prolonged second stage of labour. [5]

The removal of the impacted fetal head during a second-stage cesarean delivery can be accomplished using either the traditional techniques of an abdominal-vaginal approach with the head being pushed up from the vagina (push technique) or the reverse breech extraction (pull disengagement technique), in which the surgeon reaches towards the upper uterine segment, grasps one or both fetal legs, gently stretches them until the second leg emerges, and then gently delivers the fetus by both legs. In a unique technique known as the Patwardhan technique (shoulders first), the baby's shoulders are delivered first, followed by the torso, limbs, and head. [6,7]

Conventional methods like push and pull (reverse breech) are linked to a higher

incidence of complications for mother like uterine extensions, excessive blood loss, and fever. These complications can be somewhat overcome by employing Patwardhan's method. Therefore, the purpose of this study is to compare the outcomes for the mother and the fetus during the second stage cesarean section using the Push/Pull technique versus the Patwardhan's technique. [8,9]

Materials and Methods

All the cesarean sections performed during the second stage of labour within the time frame of one year, from October 2019 to September 2020, were included in our retrospective study. The study was conducted at PES Medical College in Kuppam, Andhra Pradesh, a Tertiary care centre. The Patwardhan group and the push/pull group were the two groups studied. Both the groups were compared in terms of neonatal results, including birth weight, APGAR, and NICU stay, as well as maternal outcomes, including extension of the uterine incision, excessive blood loss, and need for blood transfusions.

Inclusion criteria:

Patient with singleton pregnancy at term in cephalic presentation with full dilatation of cervix with deeply impacted fetal head in maternal pelvis.

Exclusion criteria:

1. Multiple pregnancies.
2. Previous caesarean section/ myomectomy.
3. Antepartum haemorrhage.
4. Pregnancy less than 37 weeks.
5. Non cephalic presentations.
6. Cesarean section done after failed instrumentation (forceps /vacuum).
7. Cesarean section done during first stage of labour.

Proper records about delivery of baby were maintained. Intraoperative, immediate postoperative and neonatal complications were noted. To compare the maternal and neonatal outcomes between the two groups

and determine the p value, a paired 't' test was used.

Results

Table 1: Age wise distribution of patients:

	Patwardhan	Push/Pull Methods
Age Groups	No of Patients (80)	No of Patients (100)
20-24	22(27.5%)	18(18%)
25-29	56(70%)	79(79%)
30-34	2(2.5%)	3(3%)
Total	80	100

P=0.399

Table 2: Parity wise distribution of patients

	Patwardhan	Push/Pull Methods
Parity	No of Patients	No of Patients
Primipara	73(91.25%)	95(95%)
Multipara	7(8.75%)	5(5%)
Total	80	100

P=0.316

Table 3: Gestational age wise distribution of patients

	Patwardhan	Push/Pull Methods
Gestational Age	No of Patients	No of Patients
37-40 wks	62(77.5%)	73(73%)
>40 wks	18(22.5%)	27(27%)
Total	80	100

P=0.488

Table 4: Labour induced patients:

	Patwardhan	Push/Pull Methods
Spontaneous Or induced	No of Patients	No of Patients
Spontaneous	32(40%)	36(36%)
Induced	48 (60%)	64(64%)
Total	80	100

P=0.58

Table 5: Indications wise distribution of patients

	Patwardhan	Push/Pull Methods
Indications	No of Patients	No of Patients
Fetal Distress	19(23.75%)	25(25%)
Persistent Occipito Posterior Position	21(26.25%)	24(24%)
Deep Transverse Arrest	14(17.5%)	14(14%)
Failed Instrumentation	14(17.5%)	19(19%)
Arrest Of Descent Cpd	12(15%)	18(18%)

P=0.94

Table 6: Mean incision to closure time and decision to delivery time

	Patwardhan	Push/Pull Methods
Baby Delivery Time < 3 Min	57(71.25%)	46(46%)
Skin To Skin Delivery Time >40 Min	23(28.75%)	54(54%)

P=0.001

Table 7: Intra operative findings:

	Patwardhan	Push/Pull Methods
Complications	No of Patients	No of Patients
Uterine Vessel Injury	10	21
Cervical Lacerations	5	10
Bladder Injury	1	1
Blood Loss>1000ml (Traumatic PPH)	10	45
Unintended Extensions	10	35
Need For Blood Transfusion	14	66
Need For Hysterectomy	NIL	NIL
Post Operative Fever	8	26
Wound Gaping	2	8

Table 8: Duration of catheterization

	Patwardhan	Push/Pull Methods
Duration Of Catheterisation	No of Patients	% of Patients
18-24 hrs	48(60%)	22(22%)
25-48 hrs	22(27.5%)	53(53%)
>=49 hrs	10(12.5%)	25(25%)
Total	80	100

P=0.000001**Table 9: Duration of stay:**

	Patwardhan	Push/Pull Methods
Duration of Stay	No of Patients	No of Patients
1-5 Days	65(81.25%)	20(20%)
6-10 Days	10(12.5%)	65(65%)
>=11 Days	5(6.25%)	15(15%)
Total	80	100

Table 10: Birth weight of baby

	Patwardhan	Push/Pull Methods
Birth Weight (In Kgs)	No of Patients	No of Patients
2-2.9 Kgs	12(15%)	10(10%)
3-3.9 Kgs	63(78.75%)	83(83%)
>=4kgs	5(6.25%)	7(7%)
Total	80	100

Table 11: Neonatal outcomes

	Patwardhan	Push/Pull Methods
Neonatal Outcome	No of Patients	No of Patients
Septicemia	10(12.5%)	12(12%)
Respiratory Distress	22(27.5%)	20(20%)
Intubation Required	7(8.75%)	9(9%)
Neonatal Seizures	3(3.75%)	4(4%)
Neonatal Death	1(1.25%)	1(1%)
No Complications	37(46.25%)	54(54%)

During 1 year period between October 2019 and September 2020, 180 patients underwent second stage cesarean sections.

By using Patwardhan's technique 80 patients were delivered whereas by using

Push/pull technique delivered 100 patients were delivered.

The age and parity of the patients were two parameters where there was not a significant difference between the two groups. When compared to multigravida, second stage cesarean sections were more frequent in primigravida.

Majority of them were between 37-40wks of gestational age. Most of them were cases of induced labour.

In our study, persistent occipito posterior position (26.25%), fetal distress (23.75%), and deep transverse arrest (17.5%) were the three most frequent causes of second-stage caesarean sections in the Patwardhan group.

In push/pull group the most common indications are fetal distress(25%), Persistent occipito posterior position(24%) and Failed instrumentation(19%).

Mean incision to closure time and decision to delivery time which included baby delivery time <3 mins(57 in Patwardhan group,46 in push pull group) and skin to skin delivery time >40 min (23 in Patwardhan group,54 in push pull group) this was statistically significant $p < 0.05$.

Push and pull group had more cases of uterine incision extension than Patwardhan group(10 in Patwardhan's group vs. 35 in push/pull group, $p < 0.05$). When compared to Patwardhan's group, the push/pull group had considerably more cases of traumatic PPH (10 in Patwardhan's group vs. 45 in push and pull approach, $p < 0.05$). When compared to Patwardhan's method, the push and pull method had a higher incidence of excessive blood loss and the subsequent requirement for blood transfusion, which was statistically significant. (66 using the push and pull approach vs. 14 using Patwardhan's, $p < 0.05$).

Additionally, there were considerably more cases of postoperative fever in the push/pull group (8 in Patwardhan's group

vs. 26 in the push/pull group) than in Patwardhan's group. It is important to take into account additional causes for postoperative fever like wound gaping and urinary tract infection.

Push/pull group post operative bladder catheterization time was significantly longer than Patwardhan's group.22 in Patwardhan's group compared to 53 in push/pull group required catheterisation for 24-48hrs which was also statistically significant $p < 0.05$.

Similarly,10 in Patwardhan's group compared to 25 in push/pull group required catheterisation for >48hrs which was again statistically significant $p < 0.05$.

Additionally, compared to the cases in Patwardhan's group, the push/pull group's length of hospital stay was longer. Neonatal complications like septicaemia, respiratory distress, requirement of intubation, neonatal seizures and neonatal mortality were similar in both groups in our study.

Discussion

Because of the distorted morphology of the maternal pelvis, edematous tissues and the impingement of fetal head in the maternal pelvis which increases both maternal and fetal morbidity, second stage cesarean sections are technically difficult. As the duration of second stage labour lengthens, the lower uterine segment is stretched out and thinned out, creating complications for both mother and fetus. [10]

Out of a total of 180 cases in our study, 80 were delivered by using Patwardhan method and 100 by using push-pull method. [11,12]

In our patients the mean age was 27 years in both the groups. Among these, 92.5% were primigravida and 7.5% were multigravida in both the groups this observation was similar to study by Asicioglu O [3].

Majority women belonged to gestational period of 37-40 wks, 62 (77.5%) in Patwardhan's group and 73(73%) in push pull group similar to study by Saha et al [10].

Majority were cases of induced labour 48(60%) in Patwardhan's group and 64(64%) in push pull group similar to study by Fasuba et al [2].

Persistent occipito posterior position and fetal distress were shown to be the most frequent causes of second stage cesarean sections in our study.

The skin-to-skin delivery time >40 min in our study was more in cases operated by push /pull method as compared to Patwardhan's method that is 54% vs 28% which was statistically significant. This discrepancy can be explained by the time needed to manage the complications like uterine extension and post-partum bleeding that occurred during the extraction of impacted fetal head.

In a research by Sung et al, second-stage cesarean section was performed in just 1% of cases where the surgery took more than 90 minutes [13-14]. Alexander et al [1] observed that second stage cesarean sections had an increased risk of hemorrhage and post-operative infections.

Also, the extensions in the lower uterine segment may progress into the broad ligament which increases the incidence of haemorrhage, subsequent need for blood transfusions that in turn contributes to maternal morbidity. [4]

Additionally, cesarean sections performed in the second stage are more likely to result in neonatal problems such skull fracture and intraventricular haemorrhage. [4]

Our findings were consistent with those of the study by Khosla et al [6] in which Patwardhan's technique was employed and no extensions were observed.

Our findings were in agreement with those of the Mukhopadhyay et al. study [8]. This

study came to the conclusion that prolonged second stage labour, where the lower uterine segment is edematous and fragile, frequently results in uterine extension and damage to the surrounding structures during cesarean section. When the hand is forcibly introduced into the pelvis to deliver the head that is impacted and blocked in the pelvis, this appears to result in catastrophic complications. This difficulty can be substantially addressed by adopting Patwardhan's technique; hence we should use it widely in our practice.

According to a study by Reeta Bansawal et al 15 Patwardhan group had considerably less uterine incision extensions than that of the push and pull approach (1%, 23.9%: $p < 0.01$). When compared to the Patwardhan group, the push and pull groups had considerably greater cases of traumatic PPH and blood transfusion. (1.5%, 22.5%: $p < 0.01$). In both studies, the neonatal outcome was comparable. In their study, Manju Lal et al. found that the rate of uterine incision extension and traumatic PPH was substantially greater in group B (pull technique), at 23% and 25%, respectively, than in group A (Patwardhan), at 4.34% and 4.34%, respectively. As per the study by Ambreen Qureshi et al., the shoulder first approach, also known as the Patwardhan technique, is always a better and safer method for extracting impacted fetal head. [15]

Maternal outcomes, such as uterine extensions, excessive blood loss, the requirement for blood transfusions, and neonatal outcomes, were compared between the two groups in a retrospective study on second stage cesarean sections by Pradeep Kumar Sahu et al [10] in which the majority of the 79 patients had less uterine extensions and required blood transfusions, which resulted in lower maternal morbidity. Both groups shared similar neonatal problems. [16]

According to a study by Partha Mukhopadhyay et al [8] Patwardhan technique of first shoulder release was

adopted in 50 cases (study group) and compared to 50 cases (control group) in which this method was not used. Only 4 out of 50 patients in the study group had the uterine incision extension both transversely and vertically, compared to 19 out of 50 cases in the control group. The study group experienced significantly fewer maternal morbidity such as uterine extension, post-partum haemorrhage, bladder injury, need for hysterectomy, and requirement for blood transfusions. Both groups experienced similar neonatal outcomes. [17]

In terms of maternal morbidity, such as lengthening of the uterine incision, laceration of the uterine artery, bladder injury, prolonged bladder catheterization, blood transfusion, postoperative wound infections, and postoperative hospitalisation, the results of our study were almost identical to those of the studies previously mentioned.

Additionally, as stated in earlier studies, both groups had comparable numbers of newborn problems like septicemia, respiratory distress, need for intubation, neonatal seizures, and neonatal death.

Conclusion

Our study comes to the conclusion that Patwardhan's shoulder first technique for delivering the fetal head in second stage caesarean section offers a great advantage in terms of maternal safety because the maternal complications were found to be significantly lower in Patwardhan's method than the traditional Push/pull method.

Although neonatal outcomes were comparable across the two groups, Patwardhan's group had a better outcome. In order to extract the fetal head intraoperatively during a second stage caesarean section, Patwardhan's method should be used.

In order to reduce maternal and foetal morbidity, the Patwardhan manoeuvre

should be used as a primary technique in patients in the second stage of labour who have a deeply impacted fetal head.

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