

# Caesarean Section During Second Stage of Labor in a Tertiary Centre

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## ABSTRACT

**Background:** There is an alarming rise in caesarean section leading to increased adverse outcomes for both the mother and fetus when compared with vaginal delivery. Within this increasing caesarean section rate, there is a concerning increase in the rate of second stage caesarean section. This study highlight the fetomaternal outcome of caesarean section in second stage of labour.

**Methods:** This was a retrospective cohort review of all women with a singleton, cephalic fetus at term delivered by caesarean section in the second stage of labor between April 1, 2013 and March 30, 2017 at Patan Academy of Health Sciences. The main outcome measures were second stage caesarean section, indications and its maternal and fetal morbidity.

**Results:** During the study period, there were 40,860 deliveries. A total of 18,011 (44%) babies were born by caesarean section, 10484 emergency and 7527 elective. Out of the emergency caesarean section, 200 (1.9 %) were performed in second stage of labor. In this study, the most common indication was cephalopelvic disproportion. (92.4%) were delivered without a trial of instrumental delivery. In terms of maternal complications, atonic post partum haemorrhage uterine incision extension 18 (12.5%), postoperative fever 27(18.8%), wound infection 7 (4.8%) were observed. In perinatal complications, meconium stained amniotic fluid 49(34.2%), neonatal hyperbilirubinemia 14(9.7%) and increased nursery admission 2(15.3%) and 2(1.3%) perinatal mortality were seen.

**Conclusions:** Caesarean sections done in second stage of labor are associated with several intra-operative maternal complications and neonatal morbidity.

**Keywords:** Caesarean complications; emergency caesarean section; maternal morbidity; neonatal morbidity; second stage of labor.

## INTRODUCTION

Caesarean section is the most commonly performed major abdominal surgery in women. Despite efforts to limit operative abdominal deliveries, there is an alarming rise in Caesarean section (CS) leading to increased adverse outcomes for both the mother and fetus when compared with vaginal delivery.<sup>1</sup> Within this increasing CS rate, there is a concerning increase in the rate of second stage caesarean section.<sup>2</sup> Recent decline in the use of instrumental delivery,<sup>1</sup> a combination of lack of training and supervision for junior staff in second-stage decision-making, a loss of technique associated with difficult-assisted delivery<sup>2</sup> and concerns relating to maternal and neonatal morbidity with associated litigious issues might have contributed to this disturbing trend.

Second stage caesarean section is associated with increased maternal as well as fetal complications as it is technically difficult to perform because of the deeply impacted fetal head in the pelvis and the presence of thinned out edematous lower segment.<sup>3</sup>

The objective of this study is to review the second stage cesarean deliveries at Patan Hospital, their indications and associated maternal and perinatal complications.

## METHODS

This retrospective study assessed all caesarean sections performed at full cervical dilatation between 1 April 2013 and 31 March 2017 at Patan Hospital, Patan Academy of Health Sciences. Caesarean section cases were identified through the operating theatre data log.

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The medical record, specifically the record of labor and operation reports, was reviewed for all CS cases over the study period. Women with a singleton fetus in cephalic presentation at term ( $\geq 37$  weeks) who underwent CS at full dilatation were included. Multigravida with comorbid conditions like diabetes and preeclampsia were excluded. These second stage Caesarean sections were analysed in terms of indications, instrumentation before caesarean section, intra operative complications like haematuria, uterine incision extension, atonic post-partum haemorrhage (PPH), postoperative complications like febrile illness, wound infection and neonatal morbidity and mortality. All the data collected were pooled together and recorded and entered in master chart. Data analysis was done using SPSS version 17. Permission for the study and ethical approval was obtained from the institutional review committee (IRC) of Patan Academy of Health Sciences (PAHS).

**RESULTS**

During the index period, a total of 18011 women delivered by caesarean section, 10484 emergency and 7527 elective cases. Of these 200 (1.9%) were at full cervical dilatation, >37 weeks gestation with a singleton fetus in cephalic presentation. Fifty cases were excluded and seven medical records could not be retrieved.

Figure 1 illustrates the trend of CS deliveries and normal vaginal deliveries over the time period examined. During the study period the caesarean section rate remained at a constant high, 44.5 % in 2013 to 45 % in 2016.

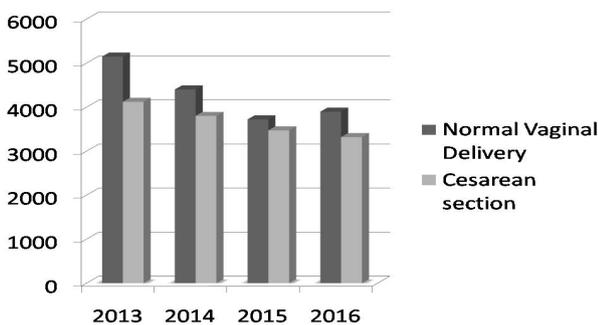


Figure 1. Trend of deliveries in the last 4 years.

Figure 2 illustrates the trend of second stage Caesarean section and instrumental delivery in the last 4 years. The rate of second stage Caesarean decreased from 4.2% (n=92) in 2013 to 0.95% (n=21) in 2017. During the study period the rate of instrumental deliveries increased from 0.1% (n=49) in 2013 to 0.3% (n=114) in 2017 with an overall instrumental delivery rate of 1.1%.

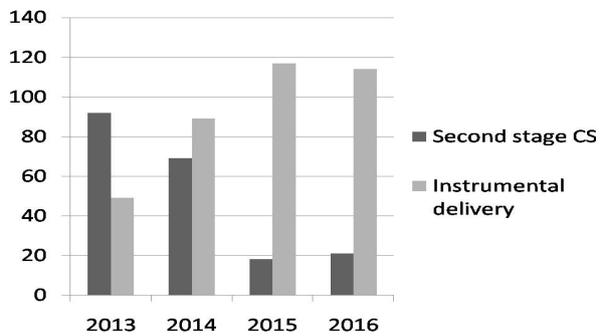


Figure 2. Trend of second stage Caesarean section and instrumental delivery in the last 4 years.

Cephalo-pelvic disproportion (CPD) and fetal distress were the most common indications for CS in the second stage (53.8% and 34.9% respectively) followed by failed instrumental delivery (7.6%). Five (3.4%) declined trial of operative vaginal delivery and opted for second-stage CS. Mean duration of surgery was 57.68 min and mean hospital stay was 5.59 days.

Table 1 summarises the maternal operative complications and table 2 outlines the perinatal complications.

Operative complications associated with emergency CS in second stage of labor, at PAHS 2013-2017.

Maternal Complications	Number	Percentage
Atonic PPH	7	4.8%
Uterine incision extension	18	12.5%
Postoperative fever	27	18.8%
Wound infection requiring resuturing	7	4.8%

Perinatal complications	Number	Percentage
Meconium stained liquor	49	34.2%
Admission to nursery	22	15.3%
NICU admission	5	3.4%
Neonatal jaundice	14	9.7%
Cephalhematoma	2	1.3%
Apgar score <7 at 5 min	13	9.0%
Fresh still birth	1	0.6%

Mean weight of the babies of the second stage caesarean section was 3.4 kg. Five (3.4%) babies were admitted to the Neonatal Intensive Care Unit and 22 (15.3%) to neonatal nursery for management of respiratory distress, sepsis, jaundice, and observation. Four (2.7%)

babies were delivered by breech extraction at CS due to difficulty in delivering the deeply impacted fetal head.

Of the study population, 104 (72.7%) second stage CS was operated by gynaecologists and 39 (27.2%) by medical officers. There were no significant differences in the operating time, incidence of extensions, febrile morbidity, duration of hospital stay and adverse fetal outcome in the surgeries done by medical officers when compared to the obstetricians.

## DISCUSSION

The international literature<sup>2,4</sup> suggests that within a rising CS rate, there is an increasing trend to perform CS at full cervical dilatation. The strong medico-legal mind set in current obstetrics, and concerns over neonatal and maternal morbidity associated with difficult or failed instrumental delivery may contribute to this trend.<sup>2</sup>

Over the 4-year study period, the overall CS rate was higher than international rates.<sup>2,4</sup> This higher rate of CS might be because Patan hospital is a referral centre where high-risk patients from surrounding districts are referred, mostly for operative deliveries. However, our rates of CS at full cervical dilatation are lower than other published cohorts.<sup>4</sup> The lower rate may be explained by more women not reaching full dilatation due to an arrest in the first stage of labor or unsuccessful induction of labor.

Caesarean section in the second stage of labor is a technically difficult operation with distortion of pelvic anatomy and the fetal head that is often deeply impacted in the maternal pelvis. Women delivered by CS at full dilation have a higher risk of obstetric haemorrhage, bladder injury, extended uterine tear leading to broad ligament hematoma, infection and longer hospital stay.<sup>3</sup> A retrospective study from Canada has shown that women delivered by Caesarean sections at full dilatation of the cervix were 2.6 times likely to have intraoperative traumatic complications.<sup>3</sup> In our study uterine incision extension was seen in 12.58%, which is slightly higher compared to the other studies.<sup>5,6</sup> This might be due to the fact that the most common indication of second stage in our study was cephalopelvic disproportion with major caput and moulding formation making the delivery of the fetal head challenging. The most common maternal operative complications seen in our study was blood stained urine in 27 (18.8%), febrile illness in 27 (18.8%), and wound infection in seven (13.9%) cases.

Atonic postpartum haemorrhage was seen in 7 (4.8%)

cases, which is slightly less than in the previous studies.<sup>5,6</sup> The use of prophylactic uterotonics in second stage Caesarean could have contributed to this decreased number. One woman returned to the operating room for management of postpartum haemorrhage. The rest of the PPH cases were managed with uterotonic drugs and uterovaginal packing. Four (2.7%) of these women required blood transfusion.

Controversies regarding the fetal outcome in the cases of caesarean sections in second stage of labor are seen throughout literature. Adverse prognostic impact on fetal outcome was noted in the studies conducted by Sucak<sup>7</sup> and Asicioglu et al.<sup>8</sup> However this was contradicted by other studies.<sup>3,9,10</sup> The most common fetal complication was meconium stained amniotic fluid, seen in 34.2% cases which is comparable to other studies.<sup>11</sup> This might be due to intra-operative fetal hypoxia caused by strong uterine contraction, deeply impacted fetal head and longer duration of second stage labor.

Neonatal Intensive Care Unit admission rate of 4.5% and nursery admission rate of 15.3 seen in our study is consistent with published literature.<sup>12</sup> This was mostly due to newborns requiring septic screening and intravenous antibiotics.

Fresh still birth and perinatal deaths were recorded 23 (4.9%) and 7 (1.5%), respectively in a study.<sup>13</sup> while we had only one fresh stillbirth and one early neonatal death. Similarly, the same study<sup>13</sup> reported 37 (6.6%) cases with Apgar score less than five at five minutes while only 13 (9.0%) of our babies had an Apgar score of <7 at 5 min.

The Royal College of Obstetricians and Gynaecologists in the UK suggests that a consultant be present at all second-stage CS to make an informed decision and to reduce complications arising from such operations. This is not possible in under resourced countries but experienced and trained medical officers may help to assist in decision making and perform instrumental deliveries and second-stage CS, thereby minimising the maternal and fetal complications.

The limitation of this study is its retrospective nature. Therefore, any suggestions made should be taken with caution.

## CONCLUSIONS

Cesarean section in full cervical dilation is an undesirable situation associated with maternal and fetal

complications. It can be avoided by careful judgement for cephalopelvic disproportion, attendance of skilled health care provider during labor and deliveries and implementation of effective instrumental delivery leading to a better fetomaternal outcome. The focus should be on ensuring normal progression of labor, proper use of the partogram, pain relief measures, oxytocin augmentation and the promotion of effective pushing techniques.

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