

**MATERNAL AND NEONATAL OUTCOME OF REVERSE BREECH
EXTRACTION VERSUS HEAD PUSHING IN CESAREAN SECTION FOR
IMPACTED FETAL HEAD, JIMMA MEDICAL CENTER, SOUTHWEST,
ETHIOPIA**

**A Research dissertation to be Submitted to Jimma University, Faculty of Medical Science
and Department of Obstetrics and Gynecology, for Partial Fulfillment for Specialty Certif-
icate in Obstetrics and Gynecology**

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Abstract

BACKGROUND:

Obstructed labour with impacted fetal head in pelvis is an obstetric complication.

It requires cesarean delivery C/D with skillful handling, extraction and delivery of fetal head can be achieved utilizing either an abdomino-vaginal approach or reverse breech extraction.

Although both methods could cause serious maternal and neonatal complications, available data seem to favor the pull method.

Objectives: to compare maternal and Neonatal outcome associated with both push and pull techniques to extract the impacted fetal head from 30th October 2019 -30th July2020 at Jimma university medical center(JUMC), South West, Ethiopia.

METHODS:cross section prospective study conducted at JimmaUniversity Medical Center from October 30th2019- July30th2020 collected by direct observation and checking patients charts through using check list. Eighty patients fulfilled the criteria enrolled in this study consecutively and interview at labour ward. Data entered into EpiData and analyzed by SPSS 25 version.

Conclusion and Recommendation:

Impacted fetal head occur in 5.5% in eighty women enrolled in this study.

Maternal outcome is better in those mothers delivered by reverse breech extraction versus head pushing with less uterine extension and there's no significant neonatal difference between two groups.

Impacted fetal head at CD should be delivered by reverse breech extraction to prevent uterine angles extension.

Key words: breech extraction ,Impacted Fetal Head , Jimma

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Lastly I would like to thank all the study participants.

LIST OF ABBREVIATIONS AND ACRONYMS

ANC Antenatal care

C/D Cesarean delivery

ENND Early neonatal death

IFH Impacted fetal head

J UMC Jimma university Medical Center

NICU: Neonatal Intensive Care Unit

OL Obstructed labor

PI Principal Investigator

SSOL Second stage of labor

SSA Sub Sahara Africa

WHO World health organization

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CHAPTER ONE

1. Introduction:

Back ground: performing cesarean section with extraction of a deeply impacted fetal head (IFH) is technically challenging even for experienced obstetrician. The difficulty for the surgeon is to disengage the impacted head by hand due to lack of space between the muscular, bony maternal pelvis and deeply impacted fetal head(1).

Dystocia which complicate up to 20% of all vaginal deliveries is often diagnosed in second stage of labour where the head engaged in the pelvis. However CD cannot provide assurance against maternal and neonatal morbidity when there is difficulty in a disengaging a deeply impacted fetal head that may result in serious maternal and neonatal morbidity(2).

CD in late labour or at full dilatation with reduced liquor and an engaged fetal head carries a higher rate of extension of uterine incision a rate of up to 35% has been reported(3).

Worldwide maternal mortality and morbidity due to obstructed labour has not significantly changed over the last 30 years and the figure still stands at 3-6 %(4).

Maternal complications of second stage cesarean delivery include major hemorrhage, longer hospital stay, greater risk of bladder trauma, extension tears of uterine angles leading to broad ligament hematoma. Fetal complications include hypoxia resulting from delivery of fetal head and direct trauma .the risk of postpartum complication is directly associated with duration of second stage of labour and the mode of delivery when there is failed instrumental deliveries or sequential use of vacuum or forceps there is significantly increase risk of both neonatal and maternal injury(5).

IFH is considered when the station is below the ischial spine and it's usually a consequence of prolonged second stage of labour (SSOL(2).

1.2 Statement of the problem:

Obstructed labour affects 3-6% of the women during labour globally and is considered a major cause of maternal and new born morbidity and mortality. The prenatal mortality rate reported is as high as 150-650 per 1000 and 8% of maternal mortality(6).

Royal college of obstetrician and gynecologist reported the incidence of second stage cesarean section to be 6% or 8000 deliveries each year(7).

Globally, at least 585,000 women die each year by complication of pregnancy and child birth. More than 70% of all maternal deaths are due to five major complications: hemorrhage, infection, unsafe abortion, hypertensive disorders of pregnancy and obstructed labour(OL) is one of the most common preventable causes of maternal and neonatal morbidity and mortality in developing countries(8).

In developing countries it ranges from 4-70% of all maternal deaths. Delayed and neglected management of OL causes significant maternal morbidity mainly due to infection and hemorrhage(8).

The number of second stage C/D encountered in developing countries is much higher especially in rural population due to neglected obstetric care, poor utilization of available health services, traditional beliefs and practice like preference of home delivery from traditional birth attendants, poor transport facilities and late referral from primary health care centers(9).

A rising trend in CD done at full cervical dilatation has been observed due to multiple factors(7).

In sub-Sahara Africa (SSA) including Ethiopia the prevalence of obstructed labour is higher with ranges from 3.3 -12.2%. prevalent in rural area particularly among younger age and primigravida women who are in labour at home for long time and did not have antenatal care (ANC) follow up and low educational status(4).

Systemic review conducted on eighteen health facility based maternal mortality studies between 1980-and 2012 in Ethiopia showed that the top four causes of maternal mortality were abortion related complication (31%), obstructed labour / uterine rupture (29%) sepsis/infection (21%) and hemorrhage (12%). the same study also revealed that the top for causes of maternal mortality were obstructed labour which account for (36 %) hemorrhage 22% and sepsis/ infection 13% (4).

The incidence of obstructed labour at this hospital is 12.2% study done by Shimelis (21).

1.3 significance of the study:

As there are rare studies done on comparison of maternal and neonatal outcome associated with reverse breech extraction versus head pushing for impacted fetal head extraction during C/D in this country and Jimma university medical center so far.

Hopefully this study has valuable importance to serve as a baseline and initiate researchers in filling the knowledge gap.

Assessing which method is feasible with least complications for both mother and neonate may improve their outcome.

Chapter two:

2.1 Literature review:

Incidence and risk factors

The Incidence of an impacted fetal head at the time of cesarean delivery increases because of changing practice guidelines regarding the acceptable duration of second stage of labour. A deeply impacted fetal head encountered at the time of C/D is estimated to occur during 1.5% of all cesarean deliveries worldwide and 25% of emergency C/D(10).

Women who have had failed instrumental delivery followed by caesarean section in late labour account for most of these cases .it may also be consequence of deep transverse arrest, arrest in occipito-posteripr position and unanticipated cephalopelvicdisproportion late in labour(3).

The literatures supports that for women longer time in second stage of labour is associated with increased risks of morbidity and decreasing probability of spontaneous vaginal delivery This risk increase may not be entirely related to the duration of SSOL but rather to health care provider actions and interventions in response to it (operative vaginal delivery) (11).

The contributing factors for increasing rate of second stage caesarean including concurrent increase in CD and corresponding decrease in rate of instrumental deliveries and vacuum extractor allows larger head diameter to be pulled into pelvis compared with forceps (2).

Comparing the reported rates of cesarean delivery with operative vaginal delivery among U.S, Canadian and European practices, it becomes clear that higher rate of operative vaginal delivery are often associated with lower C/D rate and vice versa(12).

Factors that contribute to the mechanism of dystocia in delivery of fetus with IFH include fetal head may be significantly molded or deflexed(10).and the tonic contracted uterus on the fetal spine act as splint by resisting both flexion at atlantooccipital joint and upward lifting of presenting part(9).

Obstetrician practice different ways to deliver deeply engaged fetal head .the method chosen may depend upon the skill and experience with a particular method there is insufficient evidence available to support the use of any method. (13)

In women with complete cervical dilatation, a relatively high transverse uterine incision is often necessary to avoid incision through the vagina and cutting through adhesion of the bladder to the lower segment, Attempts to disengage the impacted head in these cases may result in extension of uterine incision(14).

If the uterine incision is placed in the overstretched lower uterine segment during advance labour fetal shoulder is often encountered thus emphasizing the distance which the surgeon hand has to traverse before reaching below fetal head (13).

Disengagement techniques: several techniques have been described for disengagement of the impacted Fetal head (IFH);-the most common of which are the 'push' and pull, methods.

The push method of cephalic replacement has been the favored technique in united states and united kingdom since 1980s.in this method the women placed in modified lithotomy position with knees flexed and thighs abducted an assistant in sterile gloves insert a hand into the vagina and gently replaced the fetal head superiorly into the pelvis with cupped fingers as the surgeon applies traction to the fetal shoulder or attempts to flex and elevate the head into hysterotomy(10).

Reverse breech extraction also known as a pull technique, after opening the uterus the surgeon introduce a hand through the uterine incision towards the upper segment ,grasp both feet's and gently pull the fetus up to extract it(5).

In patwardhans method of delivery in obstructed labour, the incision over the lower uterine segment is made at the level of anterior shoulder of the baby as the head is deeply impacted, anterior shoulder is then delivered along with anterior arm by hooking a finger in the elbow if required , posterior shoulder is rotated forward and is similarly delivered .the trunk ,breech and the lower limbs are successively delivered by traction on arm aided by fundal pressure(9).

According to randomized comparative study done in Nigeria between 1 June, 1998 and 31 May 2000 showed that the pull method of delivery is safer and faster than the push method of delivery when delivering a live fetus with IFH for prolonged OL at cesarean section. The maternal complications were less and the operating time significantly shortened(15).

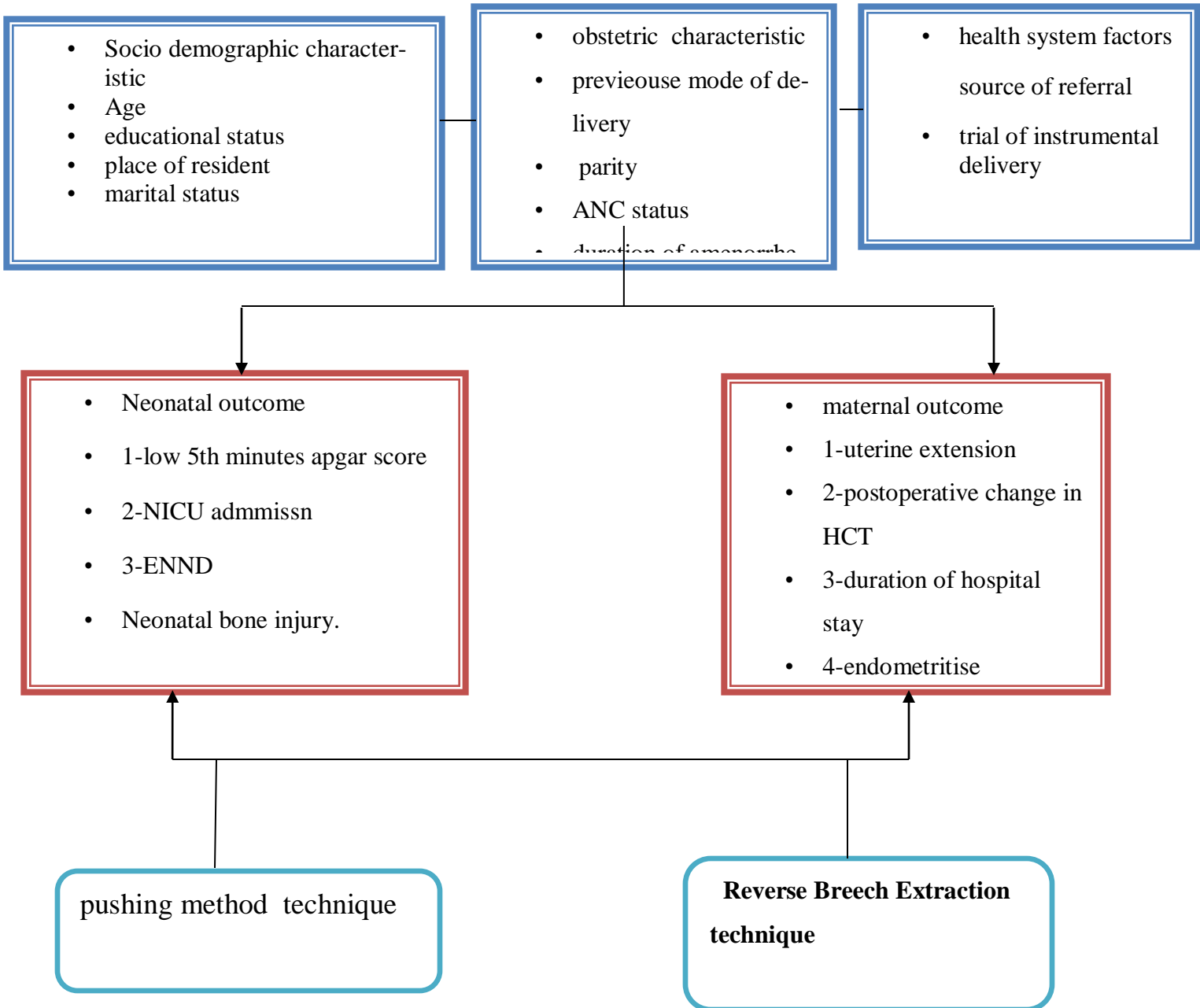
According to prospective comparative study was conducted in Egypt ZagazigUniversity from April 2011 to May 2012 80 women included in the study and the result showed that the intraoper-

ative complications mainly extension of uterine incision was occurred significantly lower in the pull compared to the push method.

Also they found that pull method was associated with significantly lower amount of blood loss intraoperative ,besides lesser operative time compared to push method(16).

Randomized comparative study done in Iran between June1 2008 and January 31 2010 showed that both methods are associated with risk of serious maternal and neonatal complication .the pull method was associated with fewer maternal complications than the push method(17).

2.2 Conceptual framework



CHAPTER THREE: OBJECTIVES

3.1 General objectives:

- To compare maternal and neonatal outcome associated with both push and pull techniques to extract the impacted fetal head from 30th October 2019- 30th July 2020 .

3.2 specific objectives:

- To determine percentage of Women with impacted fetal head.
- To compare maternal outcome with both push and pull technique to extract the impacted fetal head.
- To compare Neonatal outcome with both push and pull technique to extract the impacted fetal head.
- Assess factors associated with better outcome with both push and pull techniques.

Chapter 4

Methods:

4.1 Study site

The study will be conducted in Jimma university Medical center. The center is one of the oldest public hospitals in the country located in Jimmatown Oromia Regional State, Ethiopia. The town is Located 357 km far away from Addis Ababa and JUMC is the only specialized teaching and referral hospital in the South Western part of country. The hospital has a predominantly rural catchment population of 15 million people for tertiary level care. It has both undergraduate and postgraduate programmed paramedical and medical department. The hospital gave health service as inpatient and outpatient. Most of study subjects found at neonatal intensive care unit (NICU) , labor and maternity ward. The service at these areas is given by pediatrician obstetrician and gynecologist (OBGYN), residents, medical interns, nurses and midwives.

4.2 Study period:

October 2019-july 2020

4.3Study Design:

Prospectivecomparison cross section study

4.4.Source population

All pregnant ladies in labour admitted to labour and delivery ward JUMC during study period.

4.4 .1 Study population

Eighty pregnant women fulfilled the inclusion criteria included in this study and 37 women diagnosed with uterine rupture excluded and there's was one maternal death during study period due to anesthesia complication also excluded from the study.

4.4.2. Inclusion and exclusion criteria

4.4 2.1 Inclusion criteria

All pregnant mothers admitted to JUMC labor and delivery ward in SSOL or OL with IFH cephalic presentation and singleton with alive fetus and consented to participate in the study.

4.4.2.2 Exclusion criteria

- Non cephalic
- IUFD
- Fetal anomaly
- Uterine rupture
- Multiple pregnancy

4.5.2 Sampling procedure

Non probability sampling purposely technique used and all study population coming to study period selected consecutively and according to surgeon skill either one of technique performed.

4.6 study variables

4.6.1 Dependent variables

Maternal outcome:

Primary outcome

- Uterine angle extension.
- Drop in postop HCT.

Secondary outcome

- Endometritis.
- Blood transfusion.
- Duration of hospital stay.
- Neonatal outcome
- 5th minutes Apgar score.
- Neonatal intensive care unit admission.

- Early neonatal death.
- Neonatal bone injury.

4.6.2 Independent variables

- Socio demographic characteristic:
 - ✓ Age
 - ✓ Educational status
 - ✓ Place of resident
 - ✓ Marital status
- Obstetric factors:
 - ✓ parity
 - ✓ ANC status
 - ✓ Duration of amenorrhea
 - ✓ Neonatal birth weight
 - ✓ Previous mode of delivery
- Health system factors:
 - ✓ Trials of instrumental delivery
 - ✓ Source of referral

4.7 Data collection tool and technique

The principle investigator administered pretested check list to all participant who fulfilled the inclusion criteria and consented to be included in the study the check list focused on sociodemographic and obstetric characteristic, intrapartum, intraoperative and delivery technique noted ,postoperative maternal and neonatal conditions been observed till patients discharged .

Data collected by observation and socio demographic characteristic taken by face to face interview next morning after surgery .The check list prepared in English the consent and sociodemographic parts translated into the local language (Afan Oromo and Amharic).Data collected by four trained nurses who works at labour operation room which one of them available on each shift

24 hours. All patients' admission diagnosis and decision for emergency CD and difficult fetal extraction at CD made by senior residents assigned in labor ward.

Lower uterine segment incision made and also the data was collected for deliveries done in 24 hours activity.

Majority of patients don't remember their last normal menstrual period and duration of amenorrhea used all of them were 9 months of amenorrhea.

4.8 Data processing and analysis

Completeness, accuracy, and consistency of collected data checked on daily basis during data collection period. The collected data entered into epidata info version 7.1 analyzed using SPSS version 25. Mean and standard deviation as well as proportion used as appropriate for describing data. The chi square test, bivariate and multivariate logistic regression analysis used to compare and identify associated factors used for qualitative variables and student-t test for quantitative variables. The 95% confidence intervals (CI) and odds ratio (OR) were calculated as appropriate. A $p < 0.05$ was considered statistically significant.

4.9 Quality control:

To assure the data quality, two days training given for four data collectors. The data collection supervised by the principal investigator. Every day the completed check list reviewed and checked for completeness and relevance by principal investigator and the necessary feedback were offered to data collectors in the next morning before the actual procedure.

Cesarean deliveries were done by senior resident and intraoperative complications recognized soon as well the neonate 5th minutes Apgar score and any neonatal or maternal complications assessed and managed according to hospital protocol.

4.10 Ethical considerations:

A formal letter of approval for this study obtained from the Ethical Review Board of institute of health Ref.NOIRB000256/2012

Informed consent sought from all study participants in a language they understand and documented, they had right to withdraw from the study at any point during data collection.

Study participants were identified by study code not by their names.

Privacy of participants and confidentiality of collected information kept in locked and key system with computer password.

4.11 Utilization and dissemination of results:

The final result from the study will be submitted to the department of obstetrics and gynecology office, JU College of Public Health & Medical Science in the form of written report and will be presented for concerned bodies. Also the results will be submitted to appropriate journal for publication.

4.12 operation and term definitions:

Impacted fetal head: is considered when the station is below the ischial spine or of their difficult extraction of fetal head at cesarean section.

An extension of uterine angle: defined as an inadvertent extension of uterine incision beyond normal limit.

LOW Apgar score: score less than 7 in 5th minutes of delivery.

Favorable maternal outcome: those mothers with no uterine extension less than 10 % drop or change in postoperative Hematocrits, and no postoperative endometritis and short hospital stay.

Unfavorable maternal outcome: those mothers with uterine angle extension and 10% or more drop in Postoperative hematocrit, short hospital stay and not complicated with endometritis.

Favorable Neonatal outcome: those neonates with 5th minute Apgar score is 7 or greater,

No need for NICU admission and not complicated with birth injury.

Unfavorable neonatal outcome: those neonates with 5th minutes Apgar score is less than 7 and needs NICU admission and complicated with ENND or birth injury.

Reverse breech extraction: means that a fetus with cephalic presentation is first extracted by breech using a high transverse or a low vertical approach.

Head pushing: cephalic extraction of fetuses with cephalic presentation assisted from below.

Early neonatal death: a baby who dies in the first week after delivery.

Results

5.1 Maternal Socio-Demographic Characteristics and obstetric history of the study participants.

Eighty pregnant laboring mothers admitted to Jimma university medical college, Jimma hospital labor and delivery ward were included in this study. The mean age of the respondents were 25.8(\pm 5.9) range from (17 years to 43years),all of the respondents were married. Majority 74(92.5%) of the study participant were housewives While 14(17.5%) of mothers were uneducated, 40(50%) attended primary education, Majority of the study participants 43(53.8%) were primiparous As shown below in the table 1.

Table 1: Socio-Demographic Characteristics and Obstetric history of the study participants of laboring mother, in Jimma medical center, south west Ethiopia, 2020.

Characteristics	Variables	Number (%)
Address	Urban	40(50%)
	Rural	40(50%)
15-20 years	15-20	18(22.5%)
21-25 years	21-25	29(36.3%)
26-30 years	26-30	19(23.8%)
31-35 years	31-35	9(11.3%)
36-45 years	35-45	5(6.3%)
Occupation	House wife	74(92.5%)
	Government Employee	5(6.3%)
	Merchant	1(1.3%)
Educational level	don't read and write	14(17.5%)
	Primary education	40(50%)
	Secondary education	17(21.3%)
	Tertiary and above	9(11.3%)
Parity	Prim parous	43(53.8%)
	Multiparous	37(46.2%)
Previous mode of delivery (n=37)	SVD	32(86.5%)
	1 SVD and 1 C/S	1(2.7%)
	1 SVD and 2 C/S	1(2.7%)
	C/S	3(8.1%)

5.2 Intrapartum history

Majority of 42(52.5%) of the study participants referred from health center, Two of the study participants (2.5%) were tried with vacuum instrumental delivery.

Diagnosis and indication for cesarean delivery were Second stage Cephalic pelvic disproportion in 68 of participants and OL in 10 of participants and, four (5%) of mothers admitted with NRFHBP, 19 (23.8%) of them have meconium stained liquor of this three (15.8%) were grade 2 and 16(84.2%) grade three. The mean pre-operative hematocrit 39.2 (± 4.3). As show in table 2.

Table 2: .Intrapartum history of study participants in Jimma medical center, southwest, Ethiopia, 2020.

Characteristics	Variables	Number (%)
Source of referral	primary hospital	23(28.7%)
	health center	42(52.5%)
	Self	13(16.3%)
	Private	2(2.5%)
Trial of instrumental delivery	Yes (vacuum)	2(2.5%)
	No	78(97.5%)
Cervical dilatation	Full	78(95.5%)
	8 CM	2(2.5%)
Status of membrane	Clear	61(76.3%)
	Meconium stained	19(23.8%)
Grade of meconium	Grade 2	3(15.8)
	Grade 3	16(84.2%)
Pre-operative hematocrit	Mean (standard deviation)	39.2(± 4.3)
Diagnosis for cesarean delivery	CPD 2ry to malposition +SSOL	68(85%)
	CPD+Malposition+G3MSAF+OL	3(3.8%)
	G3MSAF+OL	3(3.8%)
	Malposition +pervious scar+CPD+SSOL	2(2.5%)
	NRFHBP+OL	4(5%)
Station	Plus one	27(33.8%)
	Zero	53(66.3%)

5.3 Maternal outcomes

Forty-nine (61.3%) of cesarean delivery took greater than five minutes of time from incision to delivery and 31(38.8%) took less than five minutes. 75(93.8%) had less than 500 ml estimated blood loss and five(6.3%) had greater than 500 ml of estimated blood loss. The mean duration of cesarean section delivery were 43.04(9.34) minimum 25 minutes to maximum 75 minutes. Five

percent of the cesarean delivery performed had uterine extension and there were no bladder injury. Five (6.3%) had preoperative hematocrit ≤ 33 % as shown in table 3.

Table 3: maternal intra operative outcomes participants in Jimma medical center, southwest, Ethiopia, 2020.

Characteristics	Variables	Number (%)
Caesarian delivery technique	Head pushing	30(37.5%)
	Reverse breech extraction	50(62.5%)
Incision to delivery time	<5 minutes	31(38.8%)
	≥ 5 minutes	49(61.3%)
Estimated blood loss in ml	<500 ml	75(93.8%)
	≥ 500 ml	5(6.3%)
Uterine extension	Yes	4(5%)
	No	76(95%)
Preoperative hematocrit	≤ 33 %	5(6.3%)
	> 33 %	75(93.8%)
Mean duration of surgery	43.04(± 9.34)	
Maternal outcomes	Favorable	71(88.8%)
	Un favorable	9(11.2%)

5.4 Neonatal outcome

Three (3.8%) of the delivery outcome were early neonatal death and the mean fetal weight was 3401(± 401 gram). The maternal diagnosis of cesarean delivery for the three ENND were CPD 2ry to malposition +SSOL, grade three meconium + OL, non-reassuring fetal heart rate pattern and grade 3 meconium respectively and 22(27.5%) of the neonate need resuscitation and 18(22.5%) were admitted to neonatal intensive care unit. Majority 74(92.5%) of the neonate were normal birth weight, one (1.3%) was less than 2.5 kg and 78(97.5%) had APGAR 5th greater than seven and two (2.5%) ≤ 6 . As shown in the table 4.

Table 4: neonatal outcomes in Jimma medical center, southwest, Ethiopia, 2020.

Characteristics	Variables	Number (%)
Neonatal outcome	Alive	77(96.3%)
	Early neonatal death	3(3.8%)
Neonatal resuscitation	Yes	22(27.5%)
	No	58(72.5%)
Neonates need admission to NICU	Yes	18(22.5%)
	No	62(77.5%)
Fetal weight	<2.5 kg	1(1.3%)
	2.5-4 kg	74(92.5%)
	>4 kg	5(6.3%)
APGAR 5 th	≥ 7	75(93.8%)
	< 7	5(6.2 %%)
Neonatal outcome	Favorable	62(77.5%)
	Un favorable	18(22.5%)

5.5 Postpartum complications

The mean post-operative hematocrit were 34.7(±4.03).Majority 56(70%) of mother discharged from hospitals with in less than four days .Three mother had blood transfusion and five developed endomyometritis.as shown in table 5.

Table 5: post-operative complication in Jimma medical center, southwest, Ethiopia, 2020.

Characteristics	Variables	Number (%)
Post-operative hematocrit	Mean (mean deviation)	34.7(±4.03)
Duration of hospital stay	≤ 4 days	56(70%)
	>4 days	24(30%)
Blood transfusion	Yes	3(3.8%)
	No	77(96.3%)
Endomyometritis	Yes	5(6.3%)
	No	75(93.8%)
Postoperative hematocrit	≤33 %	27(33.8%)
	>33 %	53(66.3%)
Diagnosis of PPH secondary to uterine tony	Yes	3(3.8%)
	No	77(96.3%)

5.6 Comparison of head pushing versus reverse breach extraction in case of impacted fetal head during Cesarean section.

The total number of delivery during study period 4436 and total number of cesarean delivery during the study period was 1441. The incidence of cesarean delivery is 32.5% and in these study totals of 80 caesarian delivery comparing 30 head pushing and 50 reverse extractions included during the study period. The incidence of impacted fetal head was 5.55%.

The age, parity and Fetal characteristics and neonatal outcome of the studied participants was not statistically significant ($p>0.05$).but the magnitude complications are more in reverse breech extraction than pushing. Uterine extension and endomyometritis were statistically significant and the complications are more in the pushing method ($P<0.05$).incision to delivery time was significant (bellow 5 minutes) in head pushing and 72% took more than 5 minutes in reverse breach extraction.as shown in the table 6.

Table 6: comparisons of head pushing and reverse breach extraction in Jimma medical center, southwest, Ethiopia, 2020.

Age groups	Delivery method		
	Head pushing 30(37.5%)	Reverse extraction 50(62.5%)	P value
	No (%)	No (%)	
15-20 years	8(26.7%)	10(20%)	0.833
21-25 years	10(33.3%)	19(38%)	0.812
26-30 years	8(26.7%)	11(22%)	0.932
31-35 years	2(6.7%)	7(14%)	0.486
36-40 years	2(6.7%)	3(6%)	0.824
Parity	N=30	N=50	Total= 80
prime parous	18(60%)	25(50%)	0.185
Multi parous	11(36.7%)	18(36%)	0.445
Grand multi parous	1(3.3%)	7(14%)	0.583
Mean duration of labor	11.7(±5.6)	9.7(±4.6)	
Station			
0	7(23.3%)	20(40%)	0.131
+1	23(76.7%)	30(60%)	
Intraoperative Complication			
Blood loss ≥500 ml	3(10%)	2(4%)	0.640
Uterine extension	3(10%)	1(2%)	0.023*(AOR=2.99,CI(4.197-4.70)
Incision to delivery time			
≤ 5 minutes	17(56.7%)	14(28%)	0.012*(AOR=2.99,CI(2.386-3.94)
≥ 5 minutes	13(43.3%)	36(72%)	
Fetal heart beat			
+ve normal range	30(100%)	46(92%)	0.999
NRFHBP	-	4(8%)	
Postoperative complication			
Duration of hospital stay			
≤ 4 days	24(80%)	32(64%)	0.487
>4 days	6(20%)	18(36%)	
Blood transfusion	No	3(6%)	0.999
Endomyometritis	3(10%)	2(4%)	0.032*(AOR=3.832,CI(1.392-10.546)
Postoperative hematocrit < 33 gm/dl	11(36.7%)	16(32%)	0.768
The mean drop of hematocrit	4.63(±3.8)	4.97(±2.8)	0.647
Mean total duration of OR time(minutes)	40.3(±7.6)	44.7(±9.96)	0.039*
Fetal characteristics and neonatal outcome			
Fetal weight			
<2.5 kg	-	1(2%)	0.174
2.5-4 kg	27(90%)	47(94%)	
>4 kg	3(10%)	2(4%)	

Neonatal outcome			
Alive	30(100%)	47(94%)	0.999
Early neonatal death	No	3(3%)	
APGAR score 5 th min			
≥ 7	30(100%)	45(90%)	0.999
< 7	-	5(10%)	
Neonatal resuscitation	5(16.7%)	17(34%)	0.805
Admission to neonatal intensive care unit	4(13.3%)	14(28%)	0.217

5.7 comparison Factors statistically associated with head pushing versus reverse breach extraction in case of impacted fetal head during Cesarean section

Table 7: .Comparison of factors statistically significant with head pushing and reverse breach extraction in Jimma medical center, southwest, Ethiopia, 2020.

Variables	Delivery method			AOR(CI)
	Head pushing 30(37.5%)	Reverse extraction 50(62.5%)	P value	
	No (%)	No (%)		
Endomyometritis	3(10%)	2(4%)	0.032*	AOR=3.832,CI(1.392-10.546)
Uterine extension	3(10%)	1(2%)	0.023	AOR=2.99,CI(4.197-4.70)
Incision to delivery time				
≤ 5 minutes	17(56.7%)	14(28%)	0.012)	AOR=2.99,CI(2.386-3.94)
≥ 5 minutes	13(43.3%)	36(72%)		
Mean total duration of OR time(minutes)	40.3(±7.6)	44.7(±9.96)	0.039*	-8.64_-0.228

Discussion:

The morbidity related to a prolonged second stage is directly correlated with the incidence of extension of uterine angles, prolonged surgical time, bladder injury, and increase incidence of postpartum hemorrhage and hospital stay(18).

The primary maternal outcomes of this study were uterine angle extension and blood loss observed by drop in postoperative hematocrit secondary outcomes were endometritis and duration of hospital stay.

When the push method is applied uterine incision might be susceptible to extension primary because the surgeon hand are introduce deep into the vagina through an overstretched lower uterine segment to reach the deeply impacted fetal head(19).,by contrast in reverse breech extraction the hand of surgeon is introduce into the upper uterine segment probably contribute to low risk of uterine angle extension by avoiding thinned lower uterine segment.

difficult extraction of fetal head reported in eighty cases which comprising 5.55% of total deliveries during study period which is higher than study done in Israel which is 1.5% (14).Indicate high prevalence of impacted fetal head at this hospital.

Uterine extension were observed significantly lower in group of patients delivered by reverse breech extraction method compare to group delivered by push method which was statistically significant p value 0.023 similar to study done in Israel, Egypt, Yemen and India(6,14,20,21).

This showed reverse breech extraction is better than pushing method with least uterine angle extension.

Incision to delivery time was significant below 5 minutes in head pushing and more than 5 minutes in reverse breech extraction p value 0.012 against other studies with showed reverse breech extraction is shorter in incision to delivery time compare to pushing technique probably in our study the surgeon taking time using gentle traction to prevent fetal injury.

Endomyometritis were statistically significant in pushing technique than reverse breech p value 0.023 similar to study done in Iran which report higher rate of endometritis p value less than 0.001(22).

No significant difference in neonatal outcome between two groups similar to study done in Iran and study done by Lenz(1,22) unlike study done in Nigeria showed pull method of delivery is significantly better than push methods in terms of 1st and 5th minutes Apgar score and admission to neonatal intensive care unit but also they observed higher fetal injury in pull group but was not statistically significant probably due to surgeon technique (15).

Fetal distresses were observed in three of delivery outcome which complicated with ENND.

Total of 18 neonates admitted to neonatal intensive care unit for meconium aspiration syndrome.

The parameter of neonatal outcome such as meconium stained liquor, low Apgar score, birth weight and early neonatal death were not related to the technique of fetal extraction but related to the outcome of complication of prolonged labour.

There's no statistically significant difference regarding duration of hospital stays between two group similar to study done in Iran(17).probably due to prophylactic antibiotic use for all patients with obstructed labour or with prolonged rupture of membrane as per our hospital guidelines.

Three of study participants observed to have postpartum hemorrhage for which they were transfused with cross matched blood.The cause for postpartum hemorrhage were uterine atony for all which they were in reverse breech extraction group unrelated to delivery technique.

Conclusion:

- The incidence of impacted fetal head is 5.55%.
- Maternal outcome is better in those mothers delivered by reverse breech extraction versus pushing technique with less uterine extension and endomyometritis.
- There's no significant difference in Neonatal outcome and duration of hospital stay between two groups reverse breech and pushing techniques.
- **Limitation of study:**
- Duration of study period is short

Strength: this one of rarest study has been conducted in this country where incidence of obstructed labour and impacted fetal head is high.

Recommendation:

JUMC department of obstetrics and gynecology should consider reverse breech extraction a technique to be use for delivery of impacted fetal head as part of hospital guideline.

Areas for future research:

To assess associated factors that lead to impacted fetal head.

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