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Comparative Outcomes of Total Obstetric Hysterectomy Vs Supra-cervical Obstetric Hysterectomy in cases of Placenta Previa along with Placenta Accreta Spectrum

Abstract

Background: Placenta previa, particularly when associated with placenta accreta spectrum (PAS), poses significant challenges in obstetric care and increasing the risks of life-threatening maternal hemorrhage.

Aim- To compare outcomes of total obstetric hysterectomy (TOH) and supracervical obstetric hysterectomy (SCOH) in patients diagnosed with placenta previa and PAS.

Material & Methods: Observational study at Pt. JNM Medical College and Dr. BRAM Hospital, Raipur. Data taken of 136 cases of placenta previa, with 32 patients undergoing obstetric hysterectomy, of which 19 had PAS. Cases classified into two groups: TOH (n=7) and SCOH (n=12). Outcome variables were operative time, blood loss, maternal morbidity and mortality.

Results: 59% OH were done in cases of placenta previa associated with PAS. The incidence of Obstetric Hysterectomy due Placenta Previa with PAS was 0.13%. The mean blood loss was higher in the TOH group (1257 ± 408.6 mL) compared to the SCOH group (1100 ± 292.9 mL) (p=0.3). The operative duration was longer for TOH (157 minutes) than

for SCOH (136 minutes, p=0.4). Postoperatively, complications such as severe anemia were comparable (85% in TOH vs. 90% in SCOH).

Internal Iliac artery ligation prior to hysterectomy was associated with higher mean blood loss (p Value 0.01) and higher operative time (p Value 0.04). 2/19 cases lost their lives after hysterectomy. Mortality rate was 10.5% and was associated with severe PAS.

Conclusion: The study highlights the high incidence of PAS in obstetric hysterectomy. TOH and SCOH each have distinct advantages and risks that must be weighed against patient-specific factors. Direct proceeding to hysterectomy rather than after internal iliac artery ligation appear to be associated with better maternal outcome.

Key words:

OH (Obstetric hysterectomy), TOH (Total obstetric hysterectomy, SCOH (Supracervical hysterectomy), PP (Placenta previa), PAS (Placenta Accreta Spectrum)

Introduction: Placenta accreta syndrome (PAS) is a serious obstetric complication characterized by abnormal placental attachment, which can result in life-threatening hemorrhage and necessitates careful surgical management [(1)]. In developed countries the incidence of Obstetric Hysterectomy (OH) is 1/1000 deliveries whereas in developing countries, this range is 1-5/1000 deliveries. The incidence of obstetric hysterectomy is increasing with increasing rate of placenta accreta spectrum over past four decades; which is likely due to a change in risk factors [(2)]. It is markedly noticed that previous caesarean section is posing as the most important risk factor for PAS in cases of Placenta previa. PAS may occur after any kind of procedure that causes damage to the endometrium, including curettage, manual removal of the placenta, uterine-artery embolization, or myomectomy [(3,4)].

In severe cases, PAS can lead to massive hemorrhage, often necessitating an emergency obstetrical hysterectomy, a surgical procedure involving the removal of the uterus after delivery or during cesarean, is frequently required in cases of PAS and placenta previa to control life-threatening bleeding. Since the first recorded obstetric hysterectomy in the late 19th century, the procedure has evolved, with types being performed: Subtotal, Supracervical and Total obstetric hysterectomy (TOH) [(5,6,7,8)]. The former preserves the cervix and offers potential advantages in pelvic support and sexual function, while the latter removes the entire uterus, reducing the risk of residual placental

tissue and other complications but potentially affecting long-term pelvic health. However, there is ongoing debate about the relative benefits and risks of SCOH versus TOH, particularly in cases where placenta previa is complicated by PAS. Currently, the evidence regarding maternal and fetal outcomes following these procedures remains inconclusive, and data comparing the two in the context of PAS is limited. To address this knowledge gap, this study aims to conduct a comprehensive comparative analysis of maternal and fetal outcomes in patients undergoing SCOH versus TOH for placenta previa with PAS. By evaluating key parameters such as operative time, blood loss, maternal morbidity and mortality, this research seeks to provide crucial insights into the optimal surgical management of this high-risk obstetric population.

Objective: To compare the outcomes of Total Obstetric Hysterectomy (TOH) and Supracervical Obstetric Hysterectomy (SCOH) in cases of Placenta Previa with Placenta Accreta Spectrum (PAS), and to study the incidence, risk factors, and management strategies for PAS in the current clinical setting.

Materials and Methodology

This study was conducted in the Department of Obstetrics and Gynaecology at Pt. JNM Medical College and Dr. Bhimrao Ambedkar Hospital, Raipur, under Pt. Deendayal Upadhyay AYUSH University of Medical Education. This observational, analytical study spanned from November 2021 to December 2023 with up to 6-month follow-ups. All antenatal patients diagnosed with placenta previa were included in the study. Cases of obstetric hysterectomy due to placenta previa with Placenta Accreta Spectrum (PAS) were thoroughly analysed based on predefined criteria [11]. Data taken of 136 cases of placenta previa, with 32 patients undergoing obstetric hysterectomy, of which 19 had PAS. Cases classified into two groups: TOH (n=7) and SCOH (n=12). Outcome variables were operative time, blood loss, maternal morbidity and mortality.

Sample size estimation was done by using a large effect size (d = 0.95), alpha = 0.2, and a power of 80%, yielding a total sample size of 14, with at least 7 cases in each group. The study included antenatal patients aged 18-45 years diagnosed with placenta previa and PAS either prenatally through imaging (USG, MRI) or intra-operatively. Detailed intra-operative parameters, including duration of surgery, blood loss (measured using the WHO Visual Method), and peri- and postoperative complications, were recorded. Postoperative complications were noted, and patients were followed for 6 months. The WHO Visual Method was

used to estimate blood loss by assessing blood volumes in sponges and suction containers and recording external blood losses [9,10].

Data was organised into tables and analysed using various statistical tests (t-test, z-score, r-score) to determine the significance of differences between SCOH and TOH outcomes, with p-values calculated for statistical relevance.

Definitions and Terminology:

- ***Placenta Previa:*** *Refers to the placenta lying in lower segment of uterus*
- ***Types of Placenta Previa****:*
  - *Low-Lying Placenta: The leading edge of the placenta is within 20mm of the os but not covering it.*
  - *Placenta Previa: The placenta covers the os.*

- ***Placenta Accreta Spectrum (PAS):*** *Refers to abnormal placental adherence and invasion into the uterine wall, including:*
  - *Placenta Accreta: Abnormal adherence without myometrial invasion.*
  - *Placenta Increta: Invasion into the myometrium.*
  - *Placenta Percreta: Invasion beyond the myometrium into the serosa.*

Types of Obstetric Hysterectomy:

1. ***Subtotal Obstetric Hysterectomy***: *The cervix and lower uterine segment are preserved.*

2. ***Supracervical Obstetric Hysterectomy (SCOH)***: *The cervix is partially or completely left in place.*

3. ***Total Obstetric Hysterectomy (TOH)***: *The entire uterus, including the portio vaginalis of cervix, is removed.*

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Inclusion Criteria:

- Patients diagnosed with placenta previa and PAS prenatally /intra-operatively.

Exclusion Criteria:

- Patients with pre-existing coagulation disorders.

- Obstetric hysterectomies performed for reasons other than PAS, such as atonic postpartum hemorrhage or uterine rupture

- Obstetric hysterectomies performed more than 42 days postpartum.

Result: The study observed a total of 18,555 deliveries from November 2021 to December 2023. Among these, 136 cases were diagnosed with placenta previa, leading to an incidence of 0.7%. Out of the 19 cases of obstetric hysterectomies performed for placenta previa with PAS, 7 cases underwent Total Obstetric Hysterectomy (TOH) and 12 cases underwent Supracervical Obstetric Hysterectomy (SCOH). A significant number of these patients, 66.7%, belonged to urban areas. Notably, 85.7% of TOH cases and 41.6% of SCOH cases were unbooked, and the majority (100% TOH and 75% SCOH) were referred from other centres. The mean age of patients in the TOH group was 22.75 ± 3.3 years, while in the SCOH group, it was slightly higher at 28.08 ± 3.06 years. Most of the cases in the TOH group were term pregnancies (57.1%), while the majority of cases in the SCOH group were pre-term (75%). The mean gestational age in the TOH group was 38.0 ± 2.45 weeks, compared to 32.67 ± 4.54 weeks in the SCOH group. Most patients in both groups presented with complaints of vaginal bleeding, and gravida 3 status was most common (57.1% in TOH and 50% in SCOH). At admission, 28.6% of TOH cases and 50% of SCOH cases were critical. Consciousness levels improved post-operatively in the SCOH group, while tachycardia and hypotension worsened in both groups after surgery. Before surgery, PAS diagnosis was inconsistent, with ultrasound scans available for 85.7% of TOH cases and 66.7% of SCOH cases.

Placenta previa was preoperatively identified in 66.6% of TOH cases and 75% of SCOH cases, though PAS identification was much lower (33% in TOH and 12.5% in SCOH). Intraoperative findings confirmed placenta previa in 100% of cases in both groups. The mean blood loss was observed to be slightly higher in the TOH group (1257 ± 408.6 mL) compared to the SCOH group (1100 ± 292.9 mL), (p = 0.3). Also, the operating duration was longer in TOH cases (157 minutes) than in SCOH cases (136 minutes), (p = 0.4).

Table 1: Distribution of cases according to intraoperative blood loss

Blood Loss	Total Obstetric Hysterectomy (TOH) n=7		Supracervical Obstetric Hysterectomy (SCOH) n=10		P value
	Frequency	Percent	Frequency	Percent	
600-1000ml	5	71.4	4	40.0	
1001-1500ml	1	14.3	5	50.0	
>1500ml	1	14.3	1	10.0	
Mean +/- SD	1257+/-408.6		1100+/- 292.9		0.3

- Mean blood loss was higher in TOH Group in comparison to SCOH group.
- **2 cases of SCOH had their caesarean done at outside hospital and intraoperative PAS was found for which they were referred to our center for further management. Hence, accurate blood loss estimation could not be calculated in them and therefore not included in table.*

Table 2: Distribution of cases according to duration of surgery

Time in minutes	Total Obstetric Hysterectomy (TOH) n=7		Supracervical Obstetric Hysterectomy (SCOH) n=10		P value
	Frequency	Percent	Frequency	Percent	
80-99min	1	14.3	2	20.0	
100-119min	0	0.0	3	30.0	
120-139min	1	14.3	1	10.0	
140-159min	3	42.9	2	20.0	
160-179min	0	0.0	0	0.0	
180-199min	1	14.3	0	0.0	
200-219min	0	0.0	0	0.0	
220-239min	0	0.0	2	20.0	
240-259min	1	14.3	0	0.0	
Mean +/- SD	157+/-44.3		139+/-48.2	0.1	0.4

- The Operating duration of TOH was observed to be more than SCOH group.
- **2 cases of SCOH had their caesarean done at outside hospital and intraoperative PAS was found for which they were referred to our center for further management. Hence their duration of surgery was not included in the table.*

In cases where internal iliac artery ligation was performed, blood loss was significantly higher, with a mean blood loss of 1400 ± 406 mL compared to 1005 ± 162 mL when no ligation was done (p = 0.01).

No significant difference was observed in the requirement for inotropic support post-operatively between TOH (42.9%) and SCOH (58.3%) groups. However, cases with internal iliac artery ligation were more likely to require inotropic support (85.7%) compared to those without ligation (33.3%)—this difference was statistically significant (p = 0.02).

Mortality was noted in two cases from the SCOH group where internal iliac artery ligation was performed, with no deaths in the TOH group.

Table 3: Distribution of cases according to blood loss with internal iliac ligation

Blood loss	**Without internal iliac ligation**	**With internal iliac ligation**	**P value**
600-999ml	4	1	
1000-1499ml	6	2	
1500-1999ml	0	3	
>2000ml	0	1	
Mean SD	1005+/-162	1400+/-406	**0.01**

- Significantly higher blood loss was observed in cases where Obstetric Hysterectomy done after Internal Iliac artery ligation.
- **2 cases of SCOH had their caesarean done at outside hospital and intraoperative PAS was found for which they were referred to our center for further management. Hence, accurate blood loss estimation could not be calculated in them and not included in table.*

Table 4: Distribution of cases according to duration of surgery with internal iliac ligation

Duration of Surgery	**Without internal iliac ligation**	**With internal iliac ligation**	**P value**
<60mins	0	0	
60-90mins	2	0	
91-120mins	2	2	
121-150mins	5	1	
151-180mins	1	0	

181-210mins	0	1	
>210mins	0	3	
Mean SD	126+/-26.4	174+/-64.5	**0.04**

- **2 cases of SCOH had their caesarean done at outside hospital and intraoperative PAS was found for which they were referred to our center for further management. Hence their duration of surgery was not included in the table.*
- Mortality occured in two cases who had Internal Iliac ligations followed by SCOH.

Postoperative complications included anemia which was common in both the groups (85% in TOH, 90% in SCOH). ARDS was more common in the TOH group (42.9%). Long term complication like dyspareunia was found in 42.8% of TOH cases Vs 11.1% of SCOH cases. Vaginal lubrication was comparable between the groups (71.4% TOH, 77.4% SCOH), and there was no significant difference in the frequency of sexual activity between the groups. There were 2 cases of intrauterine death in each group.

Discussion: Placenta previa with Placenta Accreta Spectrum (PAS) poses one of the most significant challenges in modern obstetric practice. Its rising incidence, driven by an increase in caesarean sections and uterine surgeries, correlates directly with higher rates of obstetric hysterectomy (OH), a life-saving procedure in severe maternal hemorrhage situations. The incidence of OH in developed countries is

around 1/1000 deliveries, while in developing countries like India, the rate is higher, ranging from 1 to 5 per 1000 deliveries. In the current study, the incidence of OH was 0.17%. Historical studies such as Gautam Allahabadia et al. (1990), suggests septic abortion was the most common cause of OH, the advent of modern antibiotics and improved maternal care practices has shifted the leading cause to PAS.

In this study, we observed trends and outcomes of obstetric hysterectomies in cases of placenta previa, specifically with PAS, over a two-year period, focusing on maternal and fetal outcomes.

In comparison with global and regional studies, the common indications for OH vary. Postpartum hemorrhage (PPH) remains the most frequent cause of OH globally, with uterine atony and ruptured uterus being key contributors. However, this study aligns with findings from studies like D.W. Sturdee et al. (1986), R.K. Praneshwari et al. (2004), and Vijay Y Kalyankar et al. (2019), where placenta accreta spectrum disorders were the primary cause of OH [12-16].

Impact of Referral and Patient Population: The high percentage (84.2%) of referred cases in this study indicates the significance of inter-hospital transfer in managing complex obstetric cases. Unbooked cases constituted 56.8%, highlighting the critical need for improved antenatal care and early detection of high-risk pregnancies specially PP and PAS in cases of previous cesarean section. In current study, two cases were

operated outside this tertiary hospital and were not diagnosed as placenta previa or PAS and taken for LSCS at those centers and then referred due to PPH after LSCS. Finally, they landed in hysterectomy in our institute and in spite of OH, one pt died in post operative period. Such incidence reinforces the serious need of training for obstetric hysterectomy to all obstetricians.

The choice between TOH and SCOH can depend on the position and extent of placental invasion and the operating surgeon's choice. In this study, TOH was performed in 7 cases, while SCOH was performed in 12 cases. Although TOH offers complete removal of uterine tissue, thus reducing recurrence risk, it was associated with longer surgery duration and higher blood loss. SCOH, by preserving the cervix, resulted in shorter operative times and slightly lower intra-operative blood loss, consistent with other studies, such as those by Jayshree Mulik et al. (2019) and Ambika HE et al. (2017) [17,18].

In contrast to the purpose of ligating the internal iliac arteries to reduce blood flow to the uterus and potentially minimizing blood loss during surgery, the findings of the current study suggests that OH after IIAL was associated with higher amount of blood loss and increased intraoperative time. Conservative management of PAS can be considered in some special cases with the aim to spare fertility [19-22]. However, Internal Iliac Artery ligation before OH in cases of PAS is not

universally mandatory, but can be valuable option in specific cases. But if bleeding cannot be controlled, emergency OH is unavoidable.

Blood and blood products arrangements is essential in managing critical cases of PP and PAS to combat with severe anemia. As in current study, an average of 3 units of packed red cells (PRC) and additional blood components (FFP and platelets) were required intra-operatively.

Hemodynamic instability necessitates postoperative inotropic support in many cases of OH. Maternal morbidity remains high in this cohort, as reflected in postoperative complications. A good HDU/ICU facility should be considered as integral component for all obstetric care unit to improve maternal outcome and reduce mortality. No significant difference was observed in neonatal outcomes between two groups.

Figure: Case of Placenta Percreta

Classical Caesarean Section done followed by Supracervical Obstetric Hysterectomy

Source: Department of Obstetrics & Gynaecology, Pt.JNM Medical College, Raipur

Conclusion: The study highlights the high incidence of PAS in obstetric hysterectomy. TOH and SCOH each have distinct advantages and risks that must be weighed against patient-specific factors. Direct proceeding to hysterectomy rather than after internal iliac artery ligation appear to be associated with better maternal outcome. Regarding type of Obstetric hysterectomy, further research with larger sample size is warranted to refine management strategies for placenta previa with PAS.

Limitations of the study:

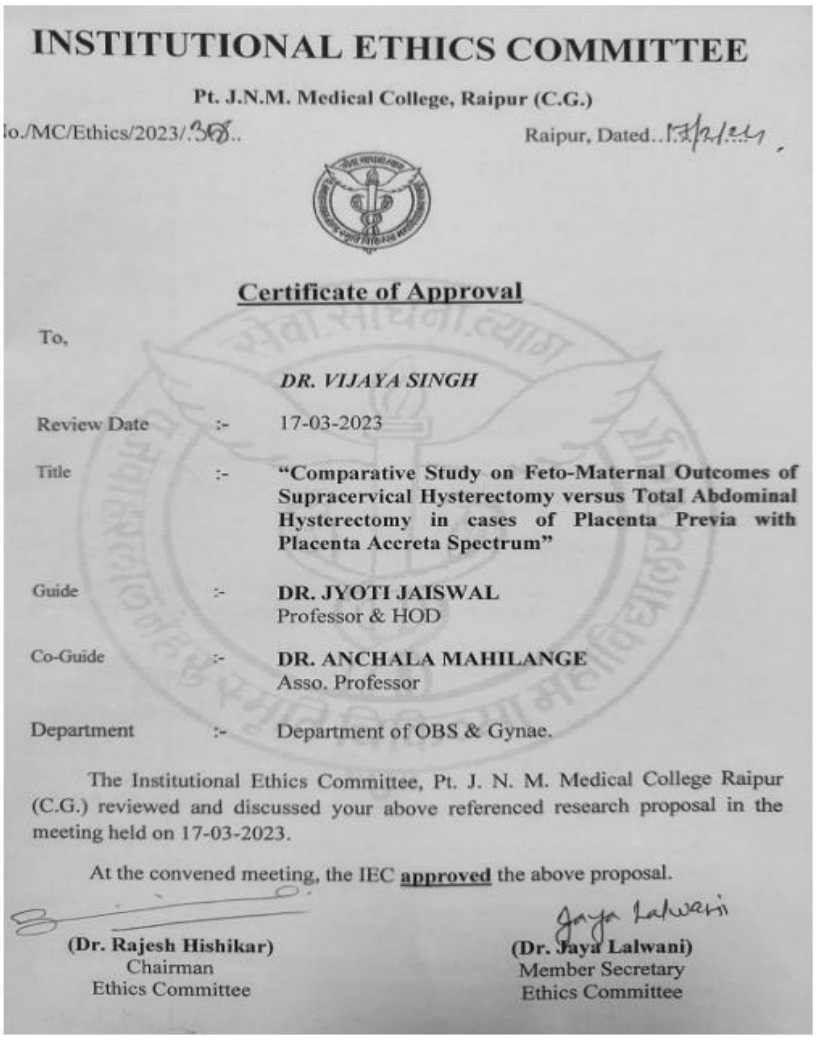
- The main limitation of our study was its small sample size.
- Different stepwise devascularisation pattern before obstetric hysterectomy was a confounding factor in this observational study.
- Duration of Surgery should have been more accurate if the time taken to release the adhesions would have been noted.

Acknowlegement: It is a testament to the collective support and encouragement of my teachers, Department of Obstetrics & Gynaecology, Pt. JNM Medical College, Raipur and my brother.

Conflict of interest: None

Source of funding: None

Ethical Approval Certificate:



INSTITUTIONAL ETHICS COMMITTEE

Pt. J.N.M. Medical College, Raipur (C.G.)

No./MC/Ethics/2023/358.. Raipur, Dated..17/3/2023

Certificate of Approval

To,

DR. VIJAYA SINGH

Review Date :- 17-03-2023

Title :- **"Comparative Study on Feto-Maternal Outcomes of Supracervical Hysterectomy versus Total Abdominal Hysterectomy in cases of Placenta Previa with Placenta Accreta Spectrum"**

Guide :- **DR. JYOTI JAISWAL**
Professor & HOD

Co-Guide :- **DR. ANCHALA MAHILANGE**
Asso. Professor

Department :- Department of OBS & Gynae.

The Institutional Ethics Committee, Pt. J. N. M. Medical College Raipur (C.G.) reviewed and discussed your above referenced research proposal in the meeting held on 17-03-2023.

At the convened meeting, the IEC **approved** the above proposal.

(Dr. Rajesh Hishikar)
Chairman
Ethics Committee

Jaya Lalwani

(Dr. Jaya Lalwani)
Member Secretary
Ethics Committee

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