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Original Research Article

Study of Efficacy of Various Surgical Techniques in Use for Controlling Bleeding from Placental Bed in Cases of Placenta Previa

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Abstract:

Aims: To study the efficacy of conservative surgical techniques like Cho square compression sutures and Stepwise uterine devascularisation in controlling the bleeding from placental bed in cases of placenta previa.

Materials and Methods: Prospective Observational study carried out to study of Efficacy of various surgical techniques in use for controlling bleeding from placental bed in cases of placenta previa‖ was conducted in the Department of Obstetrics and Gynaecology, Gandhi Medical College, Musheerabad from September 2015 to September 2017.A total number of 100 patients who were diagnosed to have Placenta Previa on USG were included in the study irrespective of their GA and parity.

Results: In cases of Placenta Previa without adherence Cho Square compression sutures were 100% effective and Stepwise Uterine Devascularisation was 79. 91% effective in controlling placental bed bleed, 9% (3 cases) underwent hysterectomy. Here p value is <0.05 (p=0.01) indicating a significant statistical difference between the two surgical procedures, with 100% success rate of Cho Square compression sutures. In cases of adherent placenta Cho Square compression sutures were 86% effective and Stepwise Uterine Devascularisation was 75% effective in controlling placental bed bleed,14% (2 cases) and 25% (1 case) underwent hysterectomy respectively. Here p value is >0.05 (p=0.3) indicating no significant statistical difference between the two surgical procedures. No statistical difference was noted between the two conservative surgical procedures in relation to blood loss and duration of surgery. The maternal mortality in this study was 0%. All mothers were discharged healthy as a result of good management by multidisciplinary team. Perinatal mortality in the present study was 15%. Prematurity, low birth weight, birth asphyxia and respiratory distress syndrome are the important factors leading to increased perinatal morbidity and mortality.

Conclusion: Conservative surgical techniques like Cho Square compression sutures and Stepwise Uterine Devascularisation are effective in controlling placental bed bleed most of the cases.

Keywords: like Cho Square compression sutures, Stepwise Uterine Devascularisation, surgical procedures.

Introduction

Postpartum haemorrhage is a leading cause of maternal mortality worldwide and is responsible for approximately 25% of all maternal deaths. Placental abnormalities like placenta previa and an adherent placenta are a major contributor to obstetric haemorrhage.

The term previa has Latin origin, meaning going before. Placenta previa is an obstetric condition in which the placenta is implanted somewhere in the lower segment of the uterus either near or over the internal cervical os, presenting ahead of the leading pole of the foetus. It should be suspected in any woman beyond 20 weeks of GA who presents with painless vaginal bleeding. It usually occurs in the second or third trimesters and rarely in the later part of the first trimester and is a major cause of antepartum haemorrhage. It is seen in approximately 0.4- 0.5% of all labours.

The incidence of placenta previa is on the rise following wide spread increase in the caesarean section rate. A meta-analysis showed that the rate of placenta previa increases with the increasing number of caesarean deliveries, with a rate of 1% after 1 caesarean delivery, 2.8% after 3 caesarean

deliveries and as high as 3.7% after 5 caesarean deliveries.[1,2]

Abnormal placentation (placenta previa and adherent placenta) is overtaking atonic PPH as an indication for peripartum hysterectomy. The morbidity rate of hysterectomy is high and can lead to adverse effects such as loss of fertility, secondary amenorrhoea, physical and psychological trauma. So uterine sparing surgery is often required in primigravidas and others who desire fertility. Hence the need for surgical techniques like Stepwise uterine devascularisation, Bilateral hypogastric artery ligation, compression sutures like Cho square, transverse B-Lynch etc. to control postpartum haemorrhage. They are reported to be successful with less operative time and fewer complications.

Keeping this point in mind, the present study was designed to know the efficacy of conservative surgical techniques like Cho Square compression sutures and Stepwise uterine devascularisation in controlling the placental bed bleeding in cases of placenta previa. The present study was conducted on 100 pregnant mothers who were diagnosed to have placenta previa admitted to Gandhi Hospital, a tertiary care centre over a period of two years.

The primary outcomes measured were preoperative haemoglobin, operative time, intraoperative blood loss, number of blood transfusions required, postoperative morbidity and foetal outcome in terms of maturity, birth weight and perinatal morbidity and mortality.

Material and Methods

This is an Prospective Observational study carried out at Gandhi Hospital over a period of 2 year. It is a tertiary care hospital and a major referral centre for high risk obstetrics in Telangana State. 100 pregnant women who were diagnosed to have placenta previa were taken into the study from September 2015 – September 2017 Written informed consent was taken from all women recruited into the study after explaining the nature of study. Details were entered in a pre-designed proforma regarding the detailed history of period of gestation, high risk factors like previous uterine manipulations and surgeries, complaints like bleeding per vaginum, past history, complications during present and past pregnancy. Investigations like Haemoglobin%, Total white blood cell count, Platelet count, Renal function tests, Blood Grouping and Typing, HIV and HbsAg status, Ultrasonography were done in all women. Additional investigations like Placental Colour Doppler was done for all major degree PP and MRI was done in selected cases where disparity was noted between USG and placental Doppler.

Maternal outcome regarding GA at delivery, mode of delivery, type of anaesthesia used, complications occurring during delivery, intraoperative surgical interventions like Cho Square compression sutures and Stepwise uterine devascularisation done to control placental bed bleed and postoperative complications were observed. Estimated blood loss was assessed roughly by weighing of laparotomy pads before and after soiling and amount in suction apparatus. In all cases, foetal outcome was observed in form of maturity, birth weight and perinatal morbidity and mortality

Inclusion Criteria

Placenta pre via diagnosed on USG undergoing abdominal delivery and who had placental bed bleed during surgery, irrespective of their gestational age and parity.

Exclusion Criteria

Abruptio placenta, Medical co-morbidities like pre-eclampsia, coagulation disorders

Statistical Analysis

The values of epidemiological factors are presented as mean ± standard deviation. The statistical tool applied was by using the Open Epi, Version 3. Qualitative and quantitative data was analysed by chi- square and ANOVA respectively. The results were considered statistically significant when the probability of the null hypothesis was less than at least 5% ($p<0.05$).

Results

Table 1: Demographic distribution of mothers with placenta previa

Age in years	No of mothers	Percentage
20-24	38	38 %
25-29	51	51 %
30-34	11	11 %
35-39	0	0%
Total	100	100 %
Booked/unbooked		
Booked	24	24%
Unbooked	76	76%
Referral/ non referral		
Referral	67	67%

Non Referral	33	33%
Bleeding per vaginum		
Present	52	52%
Absent	48	48%
Gravida		
G1	11	11%
G2	36	36%
G3	44	44%
G4	7	7%
G5	2	2%
No. of caesarean sections		
0	35	35%
1	49	49%
2	16	16%
3	0	0%
Gestational age in weeks		
<=28	3	3%
28-<32	7	7%
32-<37	50	50%
>=37	40	40%
Total	100	100%
Type		
Minor	10	10%
Major	90	90%
Finding		
No invasion	72	80%
Placenta Accreta	18	20%
Total	90	100%
GA in weeks		
<28	1	1%
28-<32	13	13%
32-<37	23	23%
>=37	63	63%

The mean age of women with PP in the present study is 26±2.7 years. The highest incidence of placenta previa is in the age group of 25-29 years i.e. 51 cases (51%) while the least incidence was in the age group of 35-39 years i.e. 0 cases. Incidences in the age groups 20-24 years and 30-34 years are 38 cases (38%) and 11 cases (11%) respectively. Unbooked cases accounted for almost three quarter of the cases. With 76% of unbooked cases, the booked cases remain at 24%. Out of the 50 cases studied, 67 cases (67%) were referred from other hospitals and 33 cases (33%) were non-referrals.

The most common presentation of women with placenta previa is antepartum haemorrhage. 52 women (52%) presented with bleeding per vaginum at the time of admission and 48(48%) presented with no complaints of bleeding per vaginum.

Though placenta previa is more commonly seen in multi-gravidas, it is not so uncommon in primigravidas, with 11% of primigravidas in the study having placenta previa. The incidence of placenta previa was highest in women with third pregnancy accounting to 44 cases(44%), followed by second pregnancy (36 cases). Among 44 cases with third pregnancy, 20 cases (46%) had 1prior LSCS and 14 cases (32%) had 2 prior LSCS.

Women with one previous Caesarean section constituted the majority accounting to 49% (49 cases) and those with two and three previous Caesarean sections accounted to 16% (16 cases) and 0% (0 cases) in the study group 35%(35 cases) of the pregnant women had no prior surgeries. Mean GA of women at admission was 35.24 ±2.9 weeks. 50 (50%) women were admitted between 32 and 37 weeks gestation, constituting the highest number and 40(40%) were admitted in term gestation group and 7% were admitted in 28 to <32 weeks gestation group. 3% were admitted in less than 28 week gestation group. Most of the patients presented in the last trimester of pregnancy with APH in 51% of cases, whereas 49% cases presented asymptomatic.

In this study, it was noted that 5(16%) out of 32 women with anterior placenta previa, 1(6%) out of 18 women with posterior placenta, and 6(12%) out of 50 women with central placenta had adherent placenta.

Out of the 90 cases with major degree placenta previa, 20% (18 cases) had placenta accrete on colour doppler.

Mean GA of women at delivery was 36±3 weeks. Majority of women underwent delivery at term gestation (63%). There was 1 baby born extremely pre-term(<28 weeks). Very preterm (28weeks-<32 weeks) constituted 13%(13 babies). Moderately to late preterm (32-<37 weeks) constituted 23% (23 babies). And, term babies constituted 63%(63 babies).

Out of 100 cases studied, pregnancy was terminated by Elective Caesarean section in 47 cases (47%), with 2 cases requiring hysterectomy. 53 cases (53%) were terminated by Emergency Caesarean section, with 4 cases requiring hysterectomy.

Table 2: Distribution according to haemoglobin percentage

Hb%	No. of women(preoperative)	No. of women(Postoperative)
<=8	0 0%	8 8%
8-8.9	11 11%	25 25%
9-9.9	24 24%	60 60%
10-10.9	36 36%	6 6%
11-11.9	24 24%	1 1%
>=12	5 5%	0 0%
(n=100)	Mean = 10.1±0.95	Mean =8.66±2.16

Mean preoperative Hb of women was 10.1±0.95. At the time of admission, 29(29%) women were not anaemic and had haemoglobin levels above 11 gm%. Women with haemoglobin levels between 10 and 11, 9 and 10 and 8 and 9 were 36(36%), 24(24%) and 11(11%) respectively. Postoperative mean Hb was 8.66 ±2.16 and 60% of women had Hb values between 9 and 10. 90(90%) were diagnose to have major degree placenta previa and only 10 (10%) women had minor degree placenta previa.

Table 3: Details of patients and intraoperative findings

Finding in placenta previa	No. of women	Percentage
Elective Caesarean section	45	45%
Emergency Caesarean section	49	49%
Elective Caesarean section +Hysterectomy	2	2%
Emergency Caesarean section+Hysterectomy	4	4%
Type of Anaesthesia		
Spinal	67	67%
General	23	23%
Spinal converted to General	10	10%
Intraoperative Findings		
Placenta Anterior	32	32%
Placenta Posterior	18	18%
Placenta Central	50	50%
No invasion of placenta	82	82%
Focal adherence of placenta,removed in piecemeal	18	18%

Out of 100 patients, Spinal anaesthesia was used in 67 cases, General anaesthesia was used in 23 cases and spinal was converted to General anaesthesia in 10 cases. Intraoperatively, placenta was found to be located anteriorly, posteriorly, and centrally in 32% (32 cases), 18%(18 cases), and 50% (3 cases) respectively. No invasion of placenta in 82% (82 cases) of women. Focal adherence of placenta was present in 18% of the cases (18 cases).

Table 4: correlation of radiological findings with intraoperative findings

Placenta	USG (N=100)	Intraoperative	
No Invasion	88	82	P=0.16
Invasion	12	18	
	Doppler (N=90)	Intraoperative	
No Invasion	72	72	P=0.5
Invasion	18	18	

p value for USG and intraoperative findings is >0.05 which is not significant.

p value for Doppler and intraoperative findings is >0.05 which is not significant. USG alone could detect 12 cases of placental invasion out of 18 cases in the study. This shows sensitivity and specificity of USG as 67% and 100% respectively in patients with adherent placenta and positive

predictive value and negative predictive value using ultrasonography as 100% and 93% respectively. Colour doppler was done for all the 90 women who were diagnosed as major degree placenta previa on USG, for evidence of features of placental invasion. 18 cases (20%) had placenta accreta. All the 18 cases had adherent placenta intraoperatively. The sensitivity, specificity, PPV and NPV of Colour Doppler were 100% each in the present study.

Table 5: Intraoperative interventions done to control placental bed bleed

	Intra operative interventions	Bleeding controlled	Not controlled	Total	
Without placental adherence (n=82)	Cho Square compression sutures	49 100%	0 0%	49 60%	p value=0.01*
	Stepwise Uterine Devascularisation (SUD)	30 91%	3 9%	33 40%	
With adherent placenta (n=18)	Cho Square compression sutures	12 86%	2 14%	14 78%	p value=0.3
	SUD	3 75%	1 25%	4 22%	
	Total	94	6	100	

In cases of PP without adherence, Cho Square compression sutures effectively controlled placental bed bleed in 49 cases (100% success) whereas SUD had 91% (30 cases out of 33) success rate in controlling bed bleed, 9% underwent hysterectomy. Here p value is <0.05, so the relation is statistically significant between the two surgical procedures

In cases of PA, Cho Square compression sutures effectively controlled placental bed bleed in 86% cases (12 cases out of 14) whereas SUD had 75% (3 cases out of 4) success rate in controlling bed bleed, 14% and 25% of cases underwent hysterectomy respectively. Here p value is >0.05, so the relation is statistically not significant.

Table 6: Amount of blood loss with type of surgical intervention

Blood Loss in litres	Cho Square sutures	Stepwise Uterine Devascularisation (SUD)
<=1.5 (n=48)	29 60%	19 40%
>1.5 (n=46)	32 70%	14 30%
	61	33
Chi square 0.85, p value =0.17		
Duration in minutes		
<=90 (n=87)	55 63%	32 37%
>90 (n=7)	6 86%	1 14%
Total	61	33
Chi square 1.4, p value=0.1		

Mean intraoperative blood loss was 1.4±0.55 litres. 14% of the cases had a blood loss between 500ml to 1000ml. In 36% of the cases, it was 1000ml to 1500ml. And, in 25% of the cases, it was 1500ml to 2000ml. Massive transfusion of blood and blood products was needed in 3% of the cases.

Out of 48 patients who had blood loss of <= 1.5 litres, in 29 (60%) cases Cho Square Compression sutures were applied, in 19 (40%) cases SUD was done. Out of 46 patients who had blood loss of >1.5 litres, in 32 (70%) cases Cho Square Compression sutures were applied, in 14 (30%) cases SUD was done. There is no statistical difference in terms of blood loss between the two surgical procedures as the p value is>0.05.

The mean blood loss with Cho Square Compression sutures and SUD was about 1.35±0.45 and 1.32±0.48 litres in the present study. Out of 61 cases to whom Cho Square compression sutures were applied, duration of surgery was <=90 minutes in 55 (90%) cases and, it was > 90 minutes in 6(10%) cases. Out of 33 cases in whom SUD was done, duration of surgery was <=90 minutes in 32 (97%) cases and it was >90 minutes in 1 (3%)case. As the p value is >0.05, there is no statistical difference between the two surgical procedures.

The mean duration of surgery with Cho Square Compression sutures and SUD was 1.2±0.29 and 1.16±0.27 hours respectively in the present study.

Table 7: Maternal and neonatal outcome in patients

Complications	No. of women	Percentage
Maternal complications		
Hysterectomy	6	6%
Ionotropic support	6	6%
Bladder injury	1	1%
Ventilator support	0	0%

TRALI	4	4%
DIC	1	1%
Acute Kidney Injury	3	3%
Infections	0	0%
Maternal death	0	0%
Total	17	
Discharged healthy	100	100%
Mortality	0	0%
Weight in Kg		
<=1	4	4%
1-1.49	8	8%
1.5-2.49	22	22%
>=2.5	66	66%
Baby outcome		
Discharged healthy	87	87%
Mortality	13	13%

It was observed that Hysterectomy was done in 6 cases (6%). 6 cases (6%) needed postoperative ionotropic support, bladder was injured in 1 case (1%), DIC was noted in 1 case (1%), TRALI was noted in 4 cases (4%)and there were3 cases(3%) with acute renal failure. No cases needed ventilator support and there were no maternal deaths. The maternal mortality in the present study was 0%(0 cases) and 100% of the women were discharged healthy (100 cases).

In the present study, babies with extremely low birth weight (<1kg) constituted 4% (6 babies) and those with very low birth weight(1-1.5kg) constituted 8% (8 babies). Low birth weight babies (1.5 - 2.5kg) were highest in number accounting to 22% (22 babies). and those with normal birth weight constituted 66% (61 babies).

Out of 100 babies born to mothers with PP the present study, 87 babies (87%) were discharged healthy and 13 babies (13%)were dead.

Discussion

Placenta previa is one of the leading causes of obstetric haemorrhage leading to increased maternal morbidity and mortality.

The present study with 100 women was undertaken at Gandhi Hospital in order to study the efficacy of surgical techniques like Cho Square compression sutures and Stepwise Uterine Devascularisation in controlling the placental bed bleed. This study was a prospective observational study. Majority of women with placenta previa were in the age group of 25-29 years i.e.(51%) 51 cases.

Table 8: Comparison of variables with previous studies.

Mean GA(weeks) at delivery	**Mean+/- SD**
Present Study	26±2.7
Khashoggi T et al [3]	27.6
Bhatt et al [4]	30.6
Dashe et al [5]	28.6
APH	
Present Study	52 %
Deborah A.Wing MD et al (6)	62.3%
Richard Silver MD et al [7]	52.6%
Salvatore Andrea Mastrolia et al [8]	42.3%
Dazhi Fan et al (9)	51.6%
Mean GA (in weeks)	
Present study	37±1
Wortman AC et al [10]	38.1±2.3
Shin JE et al [11]	37.0±2.4
Mean GA (weeks) at admission	
Present study	35.24±2.9
Zaitoun MM et al [12]	34.2±2.4
Bhat SM et al [13]	35.0±3.4
Mimura T et al [14]	35.2±2.4

The mean age of women with placenta previa was found to be 26±2.7 years in the present study while that in the studies of Khashoggi T et al,[3] and Bhatt et al[13] were 27.6 years, 28.3 years and 30.6 years, indicating that the incidence of placenta previa becomes more common in women as the age advances and is reported in literature to be the highest in women aged 35 years or older (0.8% of all deliveries) and the lowest in women aged <25 years (0.07%). Dashe et al[5] reported mean age in their study as 28.6 years respectively. Out of 100 cases in the study, 67%(67 cases) of the cases were referred to Gandhi hospital from other hospitals like the primary health centres, community health centres and private hospitals for better institutional management. Non-referrals were 33%(33 cases) and had prior antenatal visits at Gandhi Hospital.

Unbooked cases accounted for almost three-quarters of the study group (76% - 76 cases) and booked cases were 24%. Multiparity appeared to increase the occurence of Placenta Previa. Though placenta previa is more commonly seen in multi-gravidas, it is not so uncommon in primi-gravidas. In the present study, it was noted that multigravidae constituted 89% of the cases and primigravida constituted a share of 11% (11 cases). The incidence of placenta previa was highest in women with third pregnancy accounting to 44%, followed by those with second pregnancy (36%). Among the 44 cases with third pregnancy, 20 cases had 1prior LSCS and 14 cases had 2prior LSCS.

A meta-analysis done by Marshall NE et al[15] showed that the rate of PP increases with the increasing number of caesarean deliveries, with a rate of 1% after 1 caesarean, 2.8% after 4 caesarean deliveries and as high as 3.7% after 5 caesarean deliveries.

Antepartum haemorrhage was the most common presentation, seen in 52% of the cases while 48% of the cases presented with no complaints and were admitted for safe institutional delivery. Clinical presentation with APH seen in 52% cases in the present study is comparable with other studies by Richard Silver MD et al 52.6% and Dazhi Fan et al 51.6% there by stating that APH is the most common clinical presentation in patients with PP.

Out of the 52 cases with APH in the present study, 96% (50 cases) presented in the last trimester with mean GA of 37±1 weeks. With the increase of GA, the risk of APH will increase in pregnant women with PP. Considering the GA at the time of admission, 40% were admitted at the term gestation and 60% were admitted before 37 weeks of gestation. Those admitted before 28 weeks were 3%, between 28 weeks and 32 weeks were 7% and those between 32 weeks and 37 weeks were 50%. Majority of the cases (97%) were admitted in the last trimester.

Mean GA at admission in the present study is 35.24±2.9 weeks which is comparable with other studies, stating that most of the cases are admitted in the last trimester of pregnancy. It has been well established that women with previous uterine surgeries have an increased incidence of placenta previa. 65% of the women with placenta previa had prior caesarean sections, with previous 1,2, and 3 caesarean sections accounting to 49%, 16%, and 0% respectively. However, it was noted that occurrence of placenta previa in primigravida was not uncommon accounting to 35%. The risk of placenta accreta in the presence of placenta previa increases dramatically with the number of previous CS, with a 25% risk for one prior CS, and more than 40% for two prior CS in studies by Oppenheimer et al.[16]

Placental invasion is associated with previous surgeries on the uterus like caesarean sections, myomectomies, etc. This study has shown that 35% of women with no prior CS had placenta previa while those who had previous one and two CS had 49% and 16%. However, the association of previous two and three CS with placental invasion remains inconclusive due to small sample size.

Table 9: Number of previous cs and placental invasion in the present study

No. of CS	Invasion	No invasion	Total	Percentage of Invasion
0	4	31	35	11.4%
1	13	36	49	26.5%
2	1	15	16	6.25%
3	0	0	0	0%
Total	18	82	100	

About 28 (28%) women in the sample had previous miscarriages for which curettage was done to remove the retained products of conception. A significant number of cases who had curettage i.e., 6 out of 28 cases had placental invasion, coming to about 21.4%.

The total number of women who underwent CS in previous pregnancies were 65, of which 14 cases had placental invasion in the present pregnancy.
Robinson and Grobman[17]compared strategies for the timing of delivery in individuals with placenta previa and ultrasonographic evidence of placenta accreta to determine the optimal gestational age for

delivery. They found that a scheduled delivery at 34 weeks of gestation was the preferred strategy and that at any given gestational age, incorporating amniocentesis for verification of foetal lung maturity does not assist in the management of such individuals.

Table 10: Comparison of mean gestational age at delivery with previous studies.

Procedure	No. of cases	Placental Invasion	Percentage
Prior Dilatation and Curettage	28	6	21.4%
Prior CS (>=1)	65	14	21.5%
Prior Myomectomy	0	0	0

In the present study 63% of women were delivered at term. Women with minimal and controlled warning bleed with good health status and admitted preterm were managed conservatively (54 cases, including cases without APH). Mean duration of stay in hospital in antenatal period was 5.5±3.3 days in the present study. 9 cases were managed conservatively for >2 weeks. It was observed that, 29% of the women were having Hb levels above 11 gm% and 71% below 11 gm% preoperatively. The mean preoperative and postoperative Hb levels in the present study were 10.1±0.95 and 8.66±2.16. Decrease in the Hb levels were seen in the postoperative period and the mean was comparable with a study by Maurizo Arduini[18]

Placenta previa is classified into 2 types - Major and Minor. 10% of the women had minor degree placenta previa and 90% had major degree placenta previa in the sample studied. Placenta was localized using USG and based on its location, placenta previa is classified into anterior, posterior and central. Intraoperative findings were same as given in USG in all the patients (82 out of 100) without adherence (100% sensitivity and 100% specificity).

USG alone could detect 12 cases of placental invasion out of 18 cases in the study. This shows the Sensitivity and Specificity of USG as 67% and 100% and Positive predictive value and Negative predictive value as 100% and 93% respectively in patients with adherent placenta in present study. The Sensitivity, Specificity, Positive and Negative predictive values of Colour Doppler in detecting placental invasion were 100% each in the present study.

MRI is used as an adjunct when there is suspicion of invasion which couldn‘t be detected by USG or colour doppler. In the present study MRI was done for 6 women where USG showed no invasion. Colour doppler and MRI gave similar results in prenatal diagnosis of abnormal invasion of placenta in the present study.

Caesarean section was the preferred mode of delivery in all the cases in the study. 94% of the women underwent CS without caesarean hysterectomy with 45% (45 cases) elective planned CS and 49% (49 cases) emergency CS. The most common aetiology of Caesarean Hysterectomy is haemorrhage. Caesarean Hysterectomy was performed to arrest bleeding in 6% (6 cases) - 2% (2 cases) with elective CS and 4% (4 cases) with emergency CS. Spinal anaesthesia was given for 67 cases, 23 cases were managed under general anaesthesia and in 10 cases Spinal was converted to General anaesthesia.

Placenta was found extending onto the anterior wall, posterior wall and centrally covering the internal os in 32%, 18% and 50% respectively. There was no adherence of placenta in 82%. Focal adherence of placenta was noted in 18% and the placenta was removed in piecemeal.

Intraoperative interventions like Cho Square compression sutures were applied in 49 cases of which placental bed bleed was controlled in all cases (100%).

Study was done in 33 cases of which placental bed bleed was controlled in 30 (91%), rest 3 cases underwent hysterectomy. Among 33 cases,29 cases responded to step 2(B/L UA Ligation) and 4 cases required step 3, low bilateral uterine vessel ligation. Among the latter 4, hysterectomy was required in 3 cases (9%). Among them one was elective procedure and two were emergency procedures.

As the p value is <0.05, there is significant statistical difference between the two procedures. Cho Square compression sutures effectively controlled placental bed bleed in 49 cases (100% success). Cho Square compression sutures were applied in 14 cases of which placental bed bleed was controlled in 12 cases (86%) and 2 cases needed hysterectomy.

SUD was done in 4 cases of which placental bed bleed was controlled in 3 (75%) rest 1 case underwent hysterectomy. Among those 4 cases,2 cases responded to step 2(B/L UA Ligation) and 2 cases required step 3, low bilateral uterine vessel ligation. Among the latter 2, 1 case required hysterectomy.

The relation between the two techniques is not statistically significant as the p value is >0.05.

Table 11: Comparison of efficacy of conservative surgical procedures in pp and pa with previous studies

Procedure	Study	Efficacy in Cases of PP	Efficacy in Cases of PA
1.Stepwise uterine devascularisation	a) Present study	91%	75%
	b) Salah A, Abd Rabbo, et al[19]	100%	100%
	c) Gungor et al[20]	100%	-
	d) Shazly SA et al[21]	-	25%
2.Cho Square compression sutures	a) Present study	100%	86%
	b) Shazly SA et al[21]	-	100%
3.Combination of both	a) Shehata A et al[22]	100%	100%

In a study by Salah A, Abd Rabbo, et al[19] on SUD for uncontrollable PPH in 103 cases,7 cases of those had PP, among them step 2 (bilateral uterine artery ligation) was effective in 3 cases but in 4 cases who had PA, bleeding was effectively controlled by step 3(low uterine vessel ligation), 100% success rate of stepwise uterine devascularization was noted in controlling bleed due to PP.

Placenta previa and accrete syndromes constitute a huge part of obstetric haemorrhage. About 14%had a blood loss between 500ml to 1000ml. The blood loss was between 1000ml to 1500ml and 1500-2000ml in 36% and 25% of the cases respectively. Massive haemorrhage requiring multiple transfusions of blood and blood products occurred in 3% of the cases. Massive transfusion protocol was implemented and blood and blood products were transfused in 1:1 ratio. The mean blood loss in present study was 1.4±0.55 litres.

Out of 61 patients where placental bed bleed was controlled by Cho Square compression sutures, 29 patients had blood loss of <= 1.5 litres and 32 patients had blood loss of >1.5 litres. The mean blood loss with this procedure was about 1.35±0.45 litres in the present study. Out of 33 patients where placental bed bleed is controlled by SUD,19 patients had blood loss of <=1.5 litres and 14 patients had blood loss of > 1.5 litres.

The average blood loss with this procedure was about 1.32±0.48 litres. There is no statistical difference related to intraoperative blood loss between the two surgical procedures in the present study as the p value is >0.05. The mean blood loss with each procedure was comparable with studies by Salah A, Abd Rabbo, et al.[19] Conservative surgeries are effective with fewer complications and less operative time. Duration of surgery in majority of women was <90 minutes. Out of 61 cases to whom Cho Square compression sutures were applied, duration of surgery was <=90 minutes in 55 (90%)cases and, it was > 90 minutes in 6(10%) cases. Out of 33 cases in whom B/L UA Ligation was done, duration of surgery was <=90 minutes in 32 (97%)cases and it was >90 minutes in 1 (3%)case. The mean duration of surgery with compression sutures and SUD was 1.2±0.29 and1.16±0.27 hours respectively in the present study, p value here is >0.05, so the relation is statistically not significant.

Haemorrhage was the most common complication in the study necessitating interventions like compression sutures, arterial ligation and hysterectomy. Uterine artery catheterization to minimize the intraoperative blood loss was not done in any of the cases. Hysterectomy was done in 6 (6%) cases. Other complications include bladder injury in 1 case (1%), hypovolaemic shock with ionotropic support in 6 cases (6%), acute renal failure (3%), DIC was noted in 1 case, no cases with ventilator assistance or death.

Hysterectomy was done because of uncontrollable PPH in 3% and 11% of women when Cho Square suturing and SUD were done respectively in the present study. In a study by Salah A, Abd Rabbo, et al [19] 100% success rate was seen with conservative surgical procedures in PP.

The mean duration of hospital stay is 14.7±8.66 days in the present study. Among the 100 cases studied, 38% (38 cases) stayed in the hospital for a duration between 11-20 days. 13% (13 cases) stayed in the hospital for a period of 21-30 days. 42% (42 cases) stayed in the hospital for a period of less than 10 days. Prolonged hospital stay of more than 30 days was reported in 7% (7 cases). This shows that placenta previa and abnormal placentation syndromes result in increased morbidity in women.

Prolonged hospitalization leads to increase in the incidence of nosocomial infections like urinary tract infections, respiratory infections which are at times difficult to treat. However, no postoperative wound infections were reported in the present study.

Maternal mortality in the present study where conservative surgical interventions are done was 0% which is comparable with other studies, stating that conservative surgeries can be done for PPH due to PP with lesser morbidity and mortality. Placenta previa is known to be associated with prematurity. The overall perinatal mortality rate ranges between 4 –8%. The important causes are asphyxia, prematurity. The onset of bleeding before

20 weeks carries a poor foetal prognosis. Most of the neonatal mortality is attributed to prematurity with its associated risk, particularly respiratory distress syndrome and intracranial haemorrhage. 37% of the babies were born preterm and 63% were born after 37 weeks of gestation.

Perinatal mortality in the present study is 15%, which is relatively high owing to prematurity and associated complications like respiratory distress. This rate is comparable to that of the studies by Yifru Berhan[18], and Bhatt et al[13] which are 44.7%and 24.17% respectively.

Out of 100 babies delivered, 37% were preterm deliveries, 15 % were intrauterine growth restricted babies. There were 5 stillbirths and 20 babies were admitted to the neonatal intensive care unit. Out of 20 babies admitted to NICU, 10 babies were discharged healthy (50%) and 10 babiesdied (50%) due to asphyxia, respiratory distress and prematurity. Iatrogenic prematurity is most common in women with placenta previa where delivery of the baby becomes mandatory to curb the source of bleeding and to prioritize mother s health status. Administration of corticosteroids for foetal lung maturity has to be individualized in cases where the delivery is planned.

Table 12: Maternal and neonatal parameters compared with other studies

Variables	Percentage
Mean GA (weeks) at delivery	
Present Study	36±3
Robinson and Grobman[17]	34
Deborah A.Wing MD et al[6]	34.5 ±2.4
Mean Preop Hb (g/dl)	
Present	10.1±0.95
Maurizio Arduini [23]	11.1
Mean Post OP Hb(g/dl)	
Present	8.66±2.16
Maurizio Arduini [23]	8.7
Mean Blood Loss (litres)	
Present study	1.35±0.45
Maurizio Arduini [23]	1.6
Mean blood loss (litres)	
Present study	1.32±0.48
Salah A,AbdRabbo,et al [19]	1.35
Mean duration of surgery(hours)	
Present study	1.2±0.29
Maurizio Arduini et al[23]	0.44
Hysterectomy	
Present study (n=6)	3% - with Cho Square sutures 11%- with SUD
Salah A,AbdRabbo,et al [19]	0% - with SUD
Gungor et al[20]	0% - with Cho Square sutures 0%- with SUD
Mean duration of stay(days)	
Present study	14.7±8.66
Deborah A.Wing MD et al[6]	28.6±20.3

Conclusion

In order to decrease the morbidity rate and to prevent the adverse effects of hysterectomy, conservative surgical techniques like Cho Square compression sutures and Stepwise Uterine Devascularisation are effective in controlling placental bed bleed in 97% and 89% of cases and can be considered as first step measures to control postpartum haemorrhage in cases of Placenta Previa.

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