ORIGINAL ARTICLE

Hysterectomy as a Management Option for Morbidly Adherent Placenta

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ABSTRACT

Objective: To determine the outcome of interval (delayed) hysterectomy as compared to cesarean (immediate) hysterectomy in cases of placental invasion in previous cesarean sections.

Study Design: Comparative study.

Place and Duration of Study: Department of Obstetrics and Gynecology, Unit II, Jinnah Postgraduate Medical Centre, Karachi, Pakistan, from January 2008 to June 2011.

Methodology: The study subjects included 28 women with history of previous cesarean section who had low lying as well as morbidly adherent placenta (MAP) of variable degree. Patients were classified into two groups (group A and B) according to whether cesarean or interval hysterectomy was needed at time of delivery. Demographic data, obstetrical risk factors such as parity and number of previous cesarean sections were compared as well as radiological and histopathological findings, and details of the management. Chi-square, Fisher's exact and t-tests were used to compare proportions and mean values.

Results: The frequency of MAP in previous cesarean sections turned out to be 1.83/1000 (28/15,340) deliveries. Mean maternal age (26.54 vs. 29.13 years, p=0.05), mean gestational age (33.8 vs. 36 weeks, p=0.05), estimated blood loss (2615.38 vs. 1506.6 mL, p=0.001), volume of blood transfused (9.76 vs. 2.9 pints, p=0.001) and the duration of hospital stay (10.69 vs. 32.86 days, p=0.001) differed significantly between group A and group B. One maternal death occurred in each group. Eight patients had other complications in group A compared to 3 patients in group B. Three neonatal deaths occurred in group A compared to nil in group B.

Conclusion: The frequency of morbidly adherent placenta was 1.83/1000 deliveries. The management and outcome differed markedly according to emergency and scheduled antenatal diagnosis. Counselling and antenatal radiological screening can reduce the high morbidity and mortality associated with it.

Key Words: *Morbidly adherent placenta. Hysterectomy. Cesarean section. Placenta previa.*

INTRODUCTION

Morbidly adherent placenta or placenta accreta is an abnormal adherence of the placenta to the uterine wall owing to an absent or faulty decidua basalis. Separation of the morbidly adherent placenta from the uterine wall can result in fatal hemorrhage.[1] Histopathologically, morbidly adherent placenta (MAP) can be classified according to the degree of invasion of the placental tissue into the uterine wall or other surrounding structures as placenta accreta, increta and percreta. Placenta accreta is defined as adherence to the surface of the myometrium without invasion into or through the uterine muscle. Placenta increta refers to invasion into the myometrium and placenta percreta represents invasion to the serosa or other pelvic structures.[2-4]

The risk of placenta accreta increases progressively in correlation with the number of repeated cesarean deliveries.[5,6] Other significant independent risk factors include co-existent placenta previa and maternal age.[6,7] Maternal mortality with placenta percreta due to hemorrhage can be as high as 10%. Risk of damage to the bladder and uterus is 2 - 3%.[8] The development of new imaging techniques, such as magnetic resonance imaging (MRI) and transvaginal color Doppler sonography, has allowed antenatal diagnosis of this condition and elective pre-operative planning both by the obstetrician and the anesthetist.[4,9] This decreases the maternal morbidity and mortality rate by minimizing the need for transfusion of blood products.[10]

In this study, the aim was to compare the outcome of interval (delayed) hysterectomy as compared to cesarean (immediate) hysterectomy in cases of morbidly adherent placentas in previous cesarean sections.

METHODOLOGY

This experimental comparative study was conducted from January 2008 to June 2011 in Unit II, Jinnah Postgraduate Medical Centre (JPMC), Karachi. Inclusion criteria were woman with uterine scarring due to previous C-section, placenta previa/low lying placenta; and morbidly adherent placenta. Diagnosis was made either at the time of cesarean section or during the

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antenatal period through scans. These women were divided into two groups, group A and group B according to the type of hysterectomy (immediate or delayed) performed.

The patient data were further reviewed to retrieve demographic data (maternal age, gestational age and fetal weight), obstetrical history (parity, previous cesarean sections), and radiological findings as visualized on ultrasonography, color Doppler and/or MRI (placenta previa, accreta, increta or percreta), histopathological findings, hysterectomy type (immediate or delayed), associated procedures, transfusion details and duration of hospital stay. These variables were then analyzed and their differences in group A and group B were compared to study the outcome of hysterectomy in both the groups.

Group A comprised of 13 cases that underwent cesarean (immediate) hysterectomy. They presented in the emergency with a history of antepartum hemorrhage and some degree of shock without antenatal record or scan. Routine lower segment cesarean section was performed. During surgery, these patients were found to have morbidly adherent low lying placenta or (placenta previa) which could only be managed through a cesarean hysterectomy.

Group B included 15 patients who underwent interval (delayed) hysterectomy. All of them had proper antenatal scans diagnosing placental invasions deep into the myometrium, serosa and even up to the bladder wall (Figure 1). Antenatal diagnosis in our setup was made using ultrasonography, color Doppler scans and/or MRI. These cases were operated on elective basis. Also, informed consent for methotrexate prescription was taken to decrease the vascularity of the vessels invading the uterine wall. Complete blood counts and liver function tests prior to initiating chemotherapy were all found to be within normal limits. Abdomen was opened by midline infraumbilical vertical incision. Engorged placental vessels were identified. Classical incision was given on anterior uterine wall. The fetus was delivered through the incision taking care not to extend the incision till the placental edge. After the fetus was delivered, the cord was tied with silk suture and left in the uterine cavity along with the attached placenta. Uterine incision was closed with absorbable suture in two layers. Before closure of the abdomen, drain was inserted in the pelvic cavity.

Figure 1: Post-hysterectomy view of 36 weeks uterus. Placental invasion with engorged vessels seen up to the uterine serosa through the myometrium. Umbilical cord tied with silk sutures.

Postoperatively, the patients were administered intravenous antibiotics along with regular monitoring of pulse and temperature. Abdominal and vaginal examinations were also carried out regularly. Weekly injections of methotrexate in a dose of 1 mg/kg up to a maximum of 3 weeks were administered. Blood count, coagulation studies and liver function tests were done twice weekly. Interval (delayed) hysterectomy was planned in group B after three weeks. An early decision for surgery before this time was taken only in those cases who became clinically unstable. All hysterectomy specimens were sent for histopathology according to the protocols of the unit.

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 17. The chi-square and Fisher's exact test were used for categorical variables. The t-test was applied for comparison of mean values. Frequencies, means and standard deviations were computed for the study variables. The statistics thus obtained were fit into the appropriate group and their differences compared. The results were considered statistically significant when $p \leq 0.05$.

RESULTS

The total number of deliveries (vaginal + cesarean sections) during our study period was 15,340. Out of this, 28 cases were diagnosed to have morbidly adherent placenta with placenta previa and one or more previous cesarean sections. Overall incidence of MAP turned out to be 1.83/1000 deliveries. There was a significant difference in maternal ages (p=0.05) and gestational ages (p=0.05) in both the study groups (Table I). Group A had younger women with mean maternal age of 26.54 ± 2.78 years and delivered around the 8th month of gestation (33.84 ± 3.69 weeks). However, 2 women out of 13 in group A delivered preterm infants at 26 and 28 weeks gestation resulting in neonatal deaths. The total number of neonatal death (NND) in group A was 3, including these 2 preterm infants and one full term IUD.

Group B cases were older with mean maternal age of 29.13 ± 3.91 years and delivered alive and healthy fetuses around the 9th month of gestation (36.00 ± 1.69 weeks). Two patients had twin delivery. No NNDs were reported.

Table I: Demographic features of women with morbidly adherent placenta undergoing either cesarean (immediate) or interval (delayed) hysterectomy.

	Group A	Group B	p-value*	t-test
	Cesarean (immediate) hysterectomy n = 13	Interval (delayed) hysterectomy n = 15		
Demographic features				
Maternal age (years, mean ± SD)	26.54 ± 2.78	29.13 ± 3.91	0.05**	1.99
Gestational age (weeks, mean ± SD)	33.84 ± 3.69	36.00 ± 1.69	0.05**	2.03
Fetal weight (kg, mean ± SD)	2.40 ± 0.95	2.85 ± 0.49	0.12	1.62

**p-value considered significant when p ≤ 0.05; **Significant p-values.*

Table II: Obstetrical history, radiological and histopathological diagnoses and treatment details.

	Group A Cesarean (immediate) hysterectomy n = 13	Group B Interval (delayed) hysterectomy n = 15	p-value*	t-test / Chi-square test / Fisher's Exact test
Obstetric history	n (%)	n (%)		
Parity				
1	3 (23)	2 (13)	0.54	1.21
2 - 4	6 (46)	10 (67)		
> 4	4 (30)	3 (20)		
Previous cesarean section				
1	3 (23)	1 (7)	0.12	4.21
2	7 (54)	5 (33)		
> 2	3 (23)	9 (60)		
Placental invasion as visualized on scan / MRI (antenatal radiological diagnosis)***				
Placenta accreta	5 (39)	2 (13)	0.001**	12.38
Placenta increta/percreta	0	13 (87)		
Histopathological findings				
Non-Invasion	1 (7)	1 (7)	0.29	3.69
Placenta accreta	5 (39)	2 (13)		
Placenta increta	7 (54)	10 (67)		
Placenta percreta	0	2 (13)		
Hysterectomy				
Total	10 (77)	14 (93)	0.24	1.53
Sub-total	3 (23)	1 (7)		
Associated procedure				
Internal iliac artery ligation	1 (7)	4 (27)	0.33	2.40
Abdominal packing	1 (7)	0		
Transfusion details (mean ± SD)				
Estimated blood loss (ml)	2615.38 ± 416.03	1506.66 ± 854.79	0.001**	4.25
Volume of transfused blood (pints)	7.76 ± 1.78	2.93 ± 1.16	0.001**	8.6
Hospital stay (days, mean ± SD)	10.69 ± 4.81	32.86 ± 6.45	0.001**	10.16

**p ≤ 0.05; **Significant p-values; ***All 28 cases in both the study groups also had placenta previa (low lying placenta) as seen on scan/MRI.*

Table III: Frequency of maternal complications.

	Group A Cesarean (immediate) hysterectomy n = 13	Group B Interval (delayed) hysterectomy n = 15
Maternal complications	n (%)	n (%)
Bladder injury	3 (23)	1 (7)
Gut injury	1 (7)	0
DIC	2 (15)	1 (7)
Acute tubular necrosis	2 (15)	0
Septicemia	0	1 (7)
Maternal death	1 (7)	1 (7)

The identified obstetrical risk factors of MAP are shown in Table II. There was no statistically significant difference that could be seen in both these parameters for the two groups. Majority of women in the two groups, 46% in group A and 67% in group B, had a parity ranging between 2 - 4 (p=0.54). In group A, 7 out of 13 (54%) cases had two previous cesarean sections whereas majority of cases in group B, 9 out of 15 (60%) had more than two cesarean sections (p=0.12). Five out of 13 (39%) cases in group A had prior antenatal radiological scans available, all diagnosed as placenta accreta. Rest of the cases (n=8) had no antenatal scans and

presented in hemodynamic shock. In contrast, all the 15 patients of group B had prior antenatal scan records, among whom 13 out of 15 (87%) cases were diagnosed to have placenta increta/percreta. Here, the bladder wall was also found engorged on visualization at surgery (p=0.001).

Histopathological findings in both the groups were statistically insignificant (p=0.29) and were carried out as per the unit's protocol. Either total or sub - total hysterectomy was performed regardless of fertility. Majority of women had total hysterectomies, 77% in group A and 93% in group B. The remaining cases had sub-total hysterectomies mainly because of bladder invasions (p=0.24). During the procedure, some patients in both the groups suffered from hemorrhage and blood was also seen oozing from the pedicles and surrounding vessels. Haemostasis was secured in these patients through internal iliac artery ligation and abdominal packing. Internal iliac artery ligation was done in one patient from group A versus 4 patients in group B. Abdominal packing was done in one patient from group A (p=0.33) only. When the transfusion details were compared between the two study groups, a very significant difference was seen in parameters of estimated blood loss (p=0.001) and volume of blood transfused (p=0.001). Majority of the patients in group A were received in emergency with severe antepartum hemorrhage and an estimated blood loss of 2615.38 ± 416.03 milliliters. For this reason, fresh frozen plasma (FFP) and whole blood was arranged immediately and the volume of blood transfused in group A turned out to be 7.67 ± 1.78 pints with one woman receiving more than 8 pints of whole blood. In group B, the mean blood loss (1506.66 ± 854.79 mL) and subsequently the volume of blood transfused (2.93 ± 1.16 pints) was comparatively less than group A. This was because these patients were continuously scanned and monitored in the antenatal period and delivered safely before they could go into antenatal hemorrhage/shock. They also had ample time at hand to arrange for blood. However, 2 patients in group B also received 12 pints of whole blood each because of profuse bleeding at the time of hysterectomy. The hospital stays differed significantly as well (p=0.001). In group A, the mean hospital stay was only up to 10.69 ± 4.81 days, whereas in group B, all patients stayed in the hospital for more than a month (32.86 ± 6.45 days) in accordance with the weekly methotrexate injections administered for 3 weeks followed by interval hysterectomy. Only one maternal death occurred in group A and in group B each as indicated in Table III.

DISCUSSION

Morbidly adherent placenta is a potentially life threatening obstetrical emergency with grave complications. Worldwide its incidence is on the rise due to the increasing trend seen in the number of cesarean sections. According to the data during 3½ years study period, the overall incidence of morbidly adherent placenta turned out to be 28/15,340 or 1.83/1000 deliveries. The reported incidence varies from 1:540 to 1:70000 deliveries,[6] and is quite comparable. Clark *et al*. noted that women with placenta praevia and an unscarred uterus had a 5% incidence of placenta accreta.[3] The diagnosis of placenta praevia and history of four or more previous cesarean sections increased the incidence of placenta accreta to 67%.[2,3] In this study, MAP showed a higher frequency in women with two or more than two previous cesarean sections. Placental invasion can be seen in uterine scarring either due to myomectomy, repeated curettage or cesarean section. In this study, uterine scarring only due to previous cesarean sections was included as a cause of morbidly adherent placenta. Also, only those cases of MAP were included which were diagnosed clinically and proved histopathologically. According to Zelop *et al*., morbidly adherent placenta is associated with massive post-partum hemorrhage, and has become one of the most common indications for emergent peripartum hysterectomy.[11-13]

In this study, peripartum cesarean (immediate) hysterectomy was performed in 13 cases (group A). This is a major surgical procedure associated with high maternal morbidity and mortality because of excessive hemorrhage which also obstructs the view of nearby structures. For this reason, the bladder and ureters are also at increased risk of damage. Immediate arrangement of blood products for transfusion is also a big challenge. Most important is the time taken by the multidisciplinary team to reach the operation theatre. As compared to this, interval hysterectomy performed two to three weeks after delivery, is a better and safer option. There is lesser amount of blood loss and subsequently reduced morbidity and mortality. The reason for this being ample time at hand to diagnose high risk cases of MAP in the antenatal period through radiological screening and then planning and arranging for elective surgery.

Antenatal scans are done using grey scale ultrasonography, color Doppler transvaginal ultrasound and/or MRI. Wong *et al*. established several ultrasound signs for abnormal placentation in at risk patients in third trimester. They include thinning or absence of myometrial zone, visualization of placental lacunae, focal mass tissue elevation and disruption/interruption of the posterior bladder wall uterine interface.[14] Color and pulsed Doppler will show decreased value of diastolic flow in the invaded placenta. MRI is a superior investigation when other findings are inconclusive.[15] Other diagnostic criteria include laboratory assays of biochemical markers such as alpha fetoprotein and creatine kinase[16] but these markers were not used in

this study. Invasive placenta (increta and percreta) can result in increased morbidity and mortality either due to placenta invading the bladder,[17] cervix or into the broad ligament,[18] resulting in massive hemorrhage or due to complications encountered during life saving surgery. According to Oyelese *et al*., women known to have placenta accreta should be delivered by planned cesarean section followed by abdominal hysterectomy, and no attempt should be made to separate the placenta at the time of delivery[9] or bleeding will ensue. For this reason, the authors considered hysterectomy as the safest and most definitive treatment option for a morbidly adherent placenta. In some studies, arterial embolization of uterine vessels, prior to surgery, has also been descried.[19]

The key to a successful outcome in these cases is a multidisciplinary approach, appropriate communication, and early planning.[20] The authors recommend counselling pregnant women regarding delayed consequences of cesarean sections, especially development of placental invasions and the high morbidity and mortality associated with it. Targetted antenatal scanning, either through Doppler ultrasound and/or MRI should be used in high risk patients. Specialist teams should be trained appropriately for managing complications during surgery.

CONCLUSION

Morbidly adherent placenta is a rare but an ever increasing phenomenon resulting in a small sample size of only 28 cases in this study.

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