

# Treatment of Morbidly Adherent Placentation Utilizing a Standardized Multidisciplinary Approach in the Community Hospital–Private Practice Setting

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## Abstract

**Objective** Morbidly adherent placentation is associated with increased maternal morbidity and mortality. Recently, there has been mounting evidence supporting the benefits of a standardized multidisciplinary approach at tertiary teaching hospitals. Our objective was to estimate the impact of the implementation of a similar program at a high-volume private community hospital.

**Study Design** In this retrospective cohort study, we evaluated maternal outcomes in all cases of histopathologically confirmed morbidly adherent placentation since the initiation of our multidisciplinary program (2012–2016). Our data were compared with the previously published outcomes of two large cohorts from tertiary teaching hospitals in Utah and Texas.

**Results** In the 28 cases included for evaluation, our group's median estimated blood loss, median packed red blood cells transfused, median anesthesia time, median length of stay, or rates of maternal morbidity did not statistically differ from the published data in Utah or Texas.

**Conclusion** Our data demonstrate the feasibility and utility of a multidisciplinary morbidly adherent placentation program in the private practice/community hospital setting with outcomes similar to those at tertiary teaching hospitals. Implementation of such program may prove beneficial in remote centers, where various factors may prohibit patient travel to a larger center.

## Keywords

- ▶ morbidly adherent placenta
- ▶ cesarean hysterectomy
- ▶ placenta accreta

Morbidly adherent placentation is associated with increased maternal morbidity and mortality.<sup>1,2</sup> Adverse outcomes are generally related to the associated extensive blood loss and include disseminated intravascular coagulation, multiorgan failure, prolonged hospitalization, and death.<sup>1,2</sup> Unfortunately, the rates of morbidly adherent placentation continue to rise, in part due to increased rates of cesarean delivery (CD).<sup>3</sup>

In recent years, there have been mounting evidence supporting the benefits of a standardized multidisciplinary approach at tertiary teaching hospitals.<sup>4,5</sup> Indeed, reports from academic centers in Utah and Texas have reinforced the value of this approach.<sup>4,5</sup> Although ideal in theory, travel to, and delivery at large tertiary teaching institutions by the parturient facing morbidly adherent placentation is often hampered by numerous

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barriers (e.g., socioeconomic, geographic). In hopes of demonstrating the utility and feasibility of a multidisciplinary program to motivated obstetric private practitioners, our objective was to estimate the impact of the implementation of a similar program at a high-volume private community hospital.

## Materials and Methods

In this retrospective cohort study, we evaluated maternal outcomes in all cases of histopathologically confirmed morbidly adherent placentation with delivery at St. David's Women's Center of Texas (Austin, TX) during a 4-year period (2012–2016). Approval from Institutional Review Board was obtained prior to data collection.

Our multidisciplinary program was implemented in 2012 and includes a standardized management plan for all cases of known or suspected morbidly adherent placentation. Patients are routinely admitted at the 33rd week of the pregnancy (unless presenting earlier with obstetrical complications necessitating admission) to the antepartum unit under their primary obstetrician's service for planned delivery and cesarean hysterectomy at the 34th week of the pregnancy. In cases (including transports) where the primary obstetrician is not a staff at our institution, the patient is admitted under the obstetrical hospitalist service. All patients are followed by the maternal–fetal medicine service, who coordinate the overall plan of care. The patient's dedicated care team included the patient's obstetrician or obstetric hospitalist, dedicated nursing core with critical care training (readily available given the presence of dedicated critical care beds and service on our obstetric unit), as well as a consulting private practitioner team consisting of gynecologic oncology, anesthesiology, urology, and neonatology. Although consulted on only select cases, interventional radiology is made aware of every case on admission. Furthermore, all pending morbidly adherent placentation cases are reviewed at our institutional multidisciplinary perinatal care conference.

In the majority of cases (when deemed feasible), the patients underwent regional anesthesia to minimize fetal exposure, and general endotracheal intubation was used after delivery of the fetus. Large bore intravenous access along with an arterial line was obtained in all cases. Patients were placed in lithotomy position with legs in stirrups to allow access for a third surgeon and assessment of vaginal bleeding. The surgical team included the patient's primary obstetrician (or hospitalist in case of transfer of care), maternal–fetal medicine specialist, and a gynecologic oncologist. Other subspecialists (i.e., urology) attended as needed. Abdominal entry was made through a periumbilical midline incision, and delivery completed via an incision where the placenta could be avoided. Placental removal was not attempted, and the hysterotomy was closed to minimize overall blood loss. The technique of the hysterectomy (including need for use of electrocautery) was left to the discretion of the cosurgeons. Ureteral stents were placed in the majority of the cases; however, decision to place intravascular balloons by interventional radiology were individualized and based on multidisciplinary discuss of each case. Intraoperative

fluid resuscitation including blood component therapy was dictated by maternal–fetal medicine and anesthesiology.

The medical records were reviewed, and data abstracted into Microsoft Access. The variables of interest included maternal age, gestational age at delivery, gravidity, parity, number of prior CDs, date of last CD, type of anesthesia, estimated blood loss, amount of blood products transfused (including packed red blood cells [PRBC], fresh-frozen plasma, and cryoprecipitate), amount of crystalloids infused, pre- and postoperative hemoglobin value, anesthesia time, intentional or incidental damage to bladder, damage to ureter or bowel, neonatal birth weight, postoperative length of stay, and readmission or reoperation. Our data were compared with the previously published outcomes of two large cohorts from tertiary teaching hospitals in Utah and Texas.<sup>4,5</sup> With respect to the latter group, our data were compared with their multidisciplinary group's data. Patient characteristics were compared with the use of descriptive statistics. Median statistics for variables reported in both Utah and Texas studies<sup>4,5</sup> were first converted to mean statistics using the formula demonstrated by Hoza et al.<sup>6</sup> Once converted, mean statistics for variables in each group were compared using multiple *t*-tests. A probability value < 0.05 was considered significant. Analysis was performed using SPSS (version 20; SPSS Inc., Chicago, IL).

## Results

Patient demographics and clinical characteristics are presented in ► **Table 1**. The comparison groups were similar with respect to maternal age and number of prior cesareans. Seven patients (25%) did not have a prior CD. Of these, four had a prior myomectomy, two had prior intrauterine surgery as part of their infertility evaluation (septal resection and myomectomy), and one reported a dilation and curettage.

Operative characteristics and patient outcomes are presented in ► **Table 2**. In the 28 cases included for evaluation, our group's median estimated blood loss (2.1 L), median PRBC transfused (4 units), cases requiring > 4 units of PRBC (60%), median anesthesia time (240 minutes), median length of stay (5 days), or rates of maternal morbidity (including bladder or bowel injury) or reoperation did not statistically differ from the published Utah or Texas data. There were no maternal deaths in our cohort.

## Discussion

Morbidly adherent placentation is associated with increased morbidity and requires an increased level of attention from obstetric providers. Recent reports from Utah and Texas by Eller et al and Shamshirsaz et al, respectively, have demonstrated the value of a standardized multidisciplinary approach to improve outcomes when dealing with this vexing obstetrical problem.<sup>4,5</sup> However, as mentioned earlier, there are numerous barriers which may preclude a patient from being cared for at a large tertiary academic/teaching center; therefore, focus must be placed on implementing such models of care in the community setting. Our data

**Table 1** Patient demographics and clinical characteristics

	Group 1 (Austin, n = 28)	Group 2 (Utah, n = 79)	Group 3 (Texas, n = 57)	p-Value (1 vs. 2)	p-Value (1 vs. 3)
Age (y)	35 (22–46)	32 (20–44)	33 (24–45)	0.42	0.82
Gestational age at delivery (wk)	34 (26–39)	34 (17–41)	34 (16–39)	0.05	0.01
Gravidity	4 (2–9)	5 (2–13)	4 (1–14)	0.02	0.17
Parity	2 (1–5)	3 (0–11)	3 (0–12)	0.01	0.07
Prior cesarean delivery	21 (75%)	72 (91%)	51 (93%)	0.96	0.97
Number of prior cesarean deliveries					
0	4 (14%)	7 (9%)	4 (7%)	0.47	0.43
1	6 (21%)	26 (33%)	12 (21%)	0.34	0.16
2	7 (25%)	19 (24%)	24 (42%)	0.99	0.15
3 or more	8 (29%)	27 (34%)	17 (30%)	0.65	0.99

Note: Group 1, index study group from our center; Group 2, published data of multidisciplinary group in Utah; and Group 3, published data of multidisciplinary group in Texas. Data presented as median (range), n (%) unless otherwise specified.

demonstrate that implementation of a multidisciplinary morbidly adherent placentation program in the private practice–community hospital setting is feasible with outcomes similar to those at tertiary teaching hospitals.

In designing this study, we purposely chose to compare our outcomes to two different studies, as each held a different value to us. In the report by Eller et al, the comparison group was rather heterogeneous considering it included several community hospitals, and left some to conclude that the variables may have biased the results toward a more favorable one for the multidisciplinary group.<sup>5</sup> Our outcomes (from a community program) indeed supports their conclusion that such an approach is effective, and that their results were not biased. In the report by Shamshirsaz et al, the authors employed an aggressive and contemporary approach to morbidly adherent placentation in a resource rich, large academic

center, which should serve a benchmark for other programs to use when implementing such a program.<sup>4</sup> Indeed, we utilize many of their approaches (except for the described modified radical hysterectomy), and reassuringly, our data demonstrated similar outcomes in our cohort. Our higher rate of ureteral injury may be due to the standard absence of their reported radical hysterectomy approach, and accordingly, we have now implemented this into our program.

Our study has some limits, which merit discussion. Our sample size was relatively small compared with the larger published series by Eller et al and Shamshirsaz et al; therefore, drawing any meaningful conclusion about the less frequent complications or variables was precluded. Furthermore, the retrospective nature of the study precluded our ability to capture some other variables of interest including body mass index, which invariably impacts operative outcomes.

**Table 2** Operative characteristics and patient outcomes

	Group 1 (Austin, n = 28)	Group 2 (Utah, n = 79)	Group 3 (Texas, n = 57)	p-Value (1 vs. 2)	p-Value (1 vs. 3)
Estimated blood loss (L)	3 (0.75–21)	2 (0.15–10)	2.1 (0.5–18)	0.08	0.27
PRBC units transfused	4 (0–23)	Not reported	4 (0–23)	–	0.17
More than 4 PRBC units transfused	17 (61%)	34 (43%)	37 (65%)	0.05	0.65
Crystalloids infused (L)	6 (2–10)	Not reported	4 (1–16)	–	0.98
Hemoglobin decrease (mg/dL)	1.1 (–4.6 to 5.5)	Not reported	0.15 (–2.5 to 5.2)	–	0.90
Anesthesia time (min)	243 (63–450)	Not reported	287 (74–608)	–	0.06
Bowel injury	1 (3%)	Not reported	1 (2%)	–	0.35
Ureteral injury	5 (17%)	5 (6%)	1 (2%)	0.69	0.02
Birth weight (g)	2,665 (2,020–3,543)	Not reported	2,400 (800–3,900)	–	0.17
Length of stay (d)	5 (3–12)	5 (3–13)	4 (2–12)	0.17	0.80
Reoperation rate	2 (7%)	2 (3%)	3 (5%)	0.21	0.35

Abbreviation: PRBC, packed red blood cells.

Note: Group 1, index study group from our center; Group 2, published data of multidisciplinary group in Utah; and Group 3, published data of multidisciplinary group in Texas. Data presented as median (range), n (%) unless otherwise specified.

Despite these limitations, our data support the value and utility of a multidisciplinary morbidly adherent placentation program in the private practice/community hospital. Implementation of such program may prove beneficial in remote centers, where various factors may prohibit patient travel to a larger center.

#### Funding

None.

#### Conflict of Interest

None.

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