

Prophylactic Internal Iliac Artery Occlusion Balloon Placement to Reduce Operative Blood Loss in Patients with Invasive Placenta

Andrew C. Picel, MD, Brent Wolford, MD, Rory L. Cochran, PhD, Gladys A. Ramos, MD, and Anne C. Roberts, MD

ABSTRACT

Purpose: To evaluate efficacy and safety of prophylactic internal iliac occlusion balloon placement before cesarean hysterectomy for invasive placenta.

Material and Methods: A retrospective analysis was performed of patients with invasive placenta treated with and without occlusion balloon placement. Preoperative occlusion balloons were placed in 90 patients; 61 patients were treated without balloon placement (control group). Baseline demographics, including patient age, gestational age at delivery, gravidity, parity, and number of previous cesarean sections, were not significantly different ($P > .05$). Of the balloon placement group, 56% had placenta percreta compared with 25% in the control group ($P < .001$), and 83% had placenta previa compared with 66% in the control group ($P = .012$).

Results: Median blood loss was 2 L (range, 1.5–2.5 L) in the balloon placement group versus 2.5 L (range, 2–4 L) in the control group ($P = .002$). Patients with occlusion balloons were transfused a median of 2 U (range, 0–5 U) of packed red blood cells versus 5 U (range, 2–8 U) in patients in the control group ($P = .002$). In the balloon placement group, 34% had large volume blood loss $> 2,500$ mL versus 61% in the control group ($P = .001$), and 21% required blood transfusion > 6 U versus 44% in the control group ($P = .002$). Eight complications (9%) were attributed to occlusion balloon placement.

Conclusions: Prophylactic internal iliac artery occlusion balloon placement reduces operative blood loss and transfusion requirements in patients undergoing hysterectomy for invasive placenta.

ABBREVIATIONS

EBL = estimated blood loss, PRBC = packed red blood cell

Abnormal invasion of placental tissue into the uterine wall is characterized by the depth of invasion. Placenta accreta refers to trophoblastic invasion to the myometrium. Placenta increta refers to penetration into the myometrium, and placenta percreta is the most severe form with invasion into the serosa and surrounding viscera (1). The incidence of invasive placenta is increasing, corresponding with the

increasing rates of cesarean deliveries, uterine instrumentation, and placenta previa, and now occurs in 1:533 to 1:300 pregnancies (2).

Invasive placenta imparts a high risk of obstetric hemorrhage, morbidity, and mortality. Placenta percreta carries the greatest risk of maternal hemorrhage and death (3). Cesarean hysterectomy is commonly performed, although often with large-volume blood loss, averaging $> 3,000$ mL (4,5). Prenatal diagnosis allows treatment at a tertiary center with an experienced multidisciplinary team of physicians, improving maternal and neonatal outcomes (6).

Several retrospective cases series and 1 small randomized controlled trial describe iliac occlusion balloon catheter placement to decrease operative blood loss by reducing arterial inflow to the surgical field (5,7–9). The technique remains a topic of debate with mixed results in the published trials. In a prospective randomized trial, Salim et al (9) described 13 women with occlusion balloon placement,

From the Departments of Radiology (A.C.P., B.W., R.L.C., A.C.R.) and Reproductive Medicine (G.A.R.), University of California San Diego, 200 West Arbor Drive, San Diego, CA 92130-8756. Received May 17, 2017; final revision received August 1, 2017; accepted August 15, 2017. Address correspondence to A.C.P.; E-mail: apicel@ucsd.edu

None of the authors have identified a conflict of interest.

© SIR, 2017

J Vasc Interv Radiol 2017; ■:1–6

<https://doi.org/10.1016/j.jvir.2017.08.015>

with a 15% complication rate, and did not demonstrate reduced blood loss. However, the literature remains difficult to interpret because of small sample sizes, heterogeneous patient populations, and different techniques regarding balloon placement and the timing of inflation. This retrospective case-control study reviews the technique of prophylactic balloon placement and compares outcomes in patients with invasive placenta undergoing cesarean hysterectomy with and without occlusion balloon placement.

MATERIALS AND METHODS

After institutional review board approval was obtained, patients were identified from interventional radiology procedure logs and pathology specimen logs. Owing to the retrospective nature of this study, the requirements for written informed consent were waived. Clinical notes and relevant imaging were reviewed.

Study Population

Patients with pathologic diagnosis of invasive placenta following cesarean hysterectomy were included in the study. Patients undergoing prophylactic occlusion balloon placement comprised the treatment group. The decision to place balloons was made on a case-by-case basis by the multidisciplinary team caring for the patient. Patients with invasive placenta undergoing hysterectomy without occlusion balloon placement served as a control group. Patients with a pathologic diagnosis of placenta percreta were further analyzed in a separate subgroup.

Records were available for review for the period 1991–2017. Of 151 cases of invasive placenta identified, prophylactic occlusion balloons were placed in 90 cases (Table 1). In 61 cases, the patients underwent hysterectomy without prophylactic balloon placement; these patients served as a control group. In the group with balloon placement, the balloons were inflated during surgery in 42 cases (47%). A subgroup analysis was performed of patients with a pathologic diagnosis of placenta percreta ($n = 65$ patients) (Table 2). Of these 65 patients, 50 had prophylactic balloons placed, and 15 did not have balloons placed. In the percreta subgroup, the balloons were inflated in 26 cases (52%).

Baseline demographics were compared between the groups. In the overall treatment group, 84% of patients in the balloon placement group had placenta previa versus 66% in the control group ($P = .012$), and 56% of patients had placenta percreta versus 25% in the control group ($P = .001$). In the placenta percreta subgroup, a statistically significant difference was shown in gestational age at delivery with the balloon placement group delivering at an average of 34.0 weeks \pm 2.2, and the group without balloon placement delivering at an average of 29.0 weeks \pm 5.8 ($P < .001$). There was no significant correlation between gestational age at delivery and estimated blood loss (EBL) ($P = .823$) or packed red blood cell (PRBC) transfusion ($P = .926$). No significant differences were noted in age, gravidity, parity, or number of previous cesarean sections ($P > .05$).

Table 1. Patient Demographics

Characteristic	Balloons Placed (n = 90)	Balloons Not Placed (n = 61)	P Value
Age, y	33.3 \pm 5.7	33.2 \pm 6.0	.910
Gravidity, n	4.9 \pm 2.3	5.5 \pm 4.7	.288
Parity, n	2.9 \pm 1.9	2.9 \pm 2.0	.773
Gestational age at delivery, weeks	33.8 \pm 2.5	32.4 \pm 5.7	.067
Number of previous cesarean sections	2.1 \pm 1.2	1.8 \pm 1.5	.120
0	5 (6%)	12 (20%)	
1	24 (27%)	18 (29%)	
2	32 (35%)	13 (21%)	
>2	29 (32%)	18 (30%)	
Placenta previa	75 (83%)	40 (66%)	.012*
Pathologic diagnosis			< .001*
Accreta	20 (22%)	32 (52%)	
Increta	20 (22%)	14 (23%)	
Percreta	50 (56%)	15 (25%)	

Note—Continuous data are presented as mean \pm SD, and categorical variables are presented as n (%).

*Statistically significant.

Table 2. Patient Demographics in Placenta Percreta Subgroup

Characteristic	Balloons Placed (n = 50)	Balloons Not Placed (n = 15)	P Value
Age, y	32.4 \pm 5.7	32.3 \pm 6.0	.950
Gravidity, n	4.8 \pm 2.2	5.3 \pm 2.7	.456
Parity, n	2.9 \pm 1.7	3.5 \pm 2.4	.296
Gestational age at delivery, weeks	34.0 \pm 2.2	29.0 \pm 5.8	< .001*
Number of previous cesarean sections	2.2 \pm 1.2	2.7 \pm 1.8	.145
0	2 (4%)	0 (0%)	
1	13 (26%)	3 (20%)	
2	18 (36%)	6 (40%)	
>2	17 (34%)	6 (40%)	
Placenta previa	42 (84%)	10 (66%)	.157

Note—Continuous data are presented as mean \pm SD, and categorical variables are presented as n (%).

*Statistically significant.

Occlusion Balloon Placement

Occlusion balloon placement was performed in the interventional radiology suite the morning of the scheduled cesarean hysterectomy. The balloon placement technique has been previously described (7). The following description provides a general overview of the technique that was performed with some variability throughout the study period owing to operator preference and available equipment.

Conscious sedation was administered with midazolam and fentanyl following institution policy. Attention was

Download English Version:

<https://daneshyari.com/en/article/8824205>

Download Persian Version:

<https://daneshyari.com/article/8824205>

[Daneshyari.com](https://daneshyari.com)