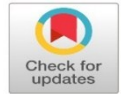


Research Article

Short term follow up for morphological cervical changes in cases of placenta accreta managed by cervical advancement as a natural tamponade



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Abstract

Background: Death as a result of pregnancy remains the chief cause of premature mortality worldwide. Placenta accreta spectrum (PAS) disorders have become a significant life-threatening obstetrical issue due to their increased incidence. Placenta accreta and placenta previa are considered important causes of PPH. In 2007, Dawlatly and his colleagues described for the first time a simple technique of suturing an inverted lip of the cervix over the bleeding placental bed that was successful in controlling the bleeding and saving the patient's life. Our study was conducted to evaluate the impact of the cervical technique and discuss cervical changes after short-term follow-up of cases who were managed by this technique. **Methods:** Our study was conducted among a total of 140 pregnant women between June 2021 and July 2022. Follow up was done after 3 months for all participating women who were diagnosed with placenta previa or accreta. 70 cases who were diagnosed with placenta accreta and subjected to the cervical advancement technique, and 70 cases who were diagnosed with placenta previa and not subjected to cervical advancement technique at Minia University Mternity Hospital. **Results:** With a p-value of less than 0.05, the mean of the cervical length, the inner-to-inner diameter, the cervical shape and the position of the cervix show a statistically significant difference between the two included groups. **Conclusion:** cervix isn't abnormally affected in cases of placenta accreta when managed by the cervical advancement technique.

Keywords: accreta, cervical advancement, preterm birth, insufficiency.

Introduction

Death as a result of pregnancy remains the chief cause of premature mortality worldwide^[1]. Over the last few decades, the prevalence of abnormally invasive placenta, also known as placenta accreta spectrum (PAS) disorders, has increased globally^[2]. Although the specific physiopathology is unknown, there is agreement that an increase in Caesarean section rates, uterine surgery, and advanced maternal age are all significant factors contributing^[3].

Several techniques for controlling massive bleeding associated with placenta previa or placenta accreta caesarean sections have

been described in the literature, including uterine packing with gauze, balloon tamponades, the B-Lynch suture, insertion of parallel vertical compression sutures, a square suturing technique, and embolization or ligation of the uterine and internal iliac arteries; however, the success rate of these maneuvers varies widely. The most common treatment used for PPH control is over-sewing of the bleeding site; however, in many cases, the bleeding points located in the lower segment and cervical canal are too deep and their sites are uncertain due to the intensity of the bleeding^[4].

In 2007, Dawlatly and his team described for the first time a simple method of suturing an inverted lip of the cervix over the bleeding placental bed. This stopped the bleeding successfully, saved the patient's life, and kept her uterus^[5].

The cervix's structure is essential to pregnancy preservation, maintaining the developing fetus in utero and establishing a barrier to the ascent of bacteria from the vagina. Weakness of the cervix may result in a lack of this barrier, which is associated with preterm birth^[6].

A decrease in cervix length is related to greater bacterial ascent into the lower pole of the uterus, with simultaneous reaction of maternal and/or fetal origin and the release of inflammatory mediators as indicated above, resulting in preterm parturition^[6].

The cervical inversion technique's efficacy and safety have been demonstrated at several obstetrics and gynaecology centers, including Zahedan University of medical sciences and health services in Zahedan, Iran (Sakhavar N et al., 2015), and Suez Canal University Hospital's Department of Obstetrics and Gynecology^{[7],[8]} and done at Minia University Maternity Hospital, Egypt^[9].

This study was conducted for short-term evaluation of "using the cervix as a natural tamponade to control bleeding caused by placenta accrete" on the morphology of the cervix, cervical length, cervical canal diameter, menstrual irregularity and 2ry postpartum hemorrhage.

Patients and Methods:

After approval by the Ethics Committee of the Faculty of Medicine, Minia University Maternity Hospital, the present study was conducted among a total of 140 pregnant women over a period of one year from June 2021 to July 2022. The study was applied to two groups: the case group and the control group. All 70 cases in the case group were diagnosed with placenta accreta by ultrasound or MRI and subjected to the cervical advancement technique intraoperatively, but in the control group all 70 cases were diagnosed with placenta previa and weren't subjected to the technique but subjected to other hemostatic sutures. All participating women desired to

preserve their fertility and all of them diagnosed with placenta accreta in case group or previa in control group. cases with placenta percreta, placenta increta, diffuse placenta accreta, massive or uncontrollable intrapartum hemorrhage were excluded from the study. After 3 months, postoperative follow-up was done for all participants by speculum examination, sound examination, transvaginal ultrasound, and hysterosalpingogram. Written informed consent was obtained from all patients with a complete explanation of the procedure and our follow up.

Technique for cervical inversion in our study:

General or spinal anaesthesia was administered based on the patient's hemodynamic status and the anaesthetic and surgical teams' recommendations. To determine the amount of blood loss, the patient was placed in a dorsal lithotomy posture with hip abduction and flexion. A good reflection of the urinary bladder was done before the uterine incision was made. In the case of placenta accreta The Triple P operation was performed initially. It consists of three main steps: perioperative localization of the upper placental edge, pelvic devascularization, and placental non-separation with myometrial excision, followed by myometrial defect repair. The placental bed was examined to identify the quantity of bleeding and whether intervention was required. Excessive bleeding from the placental bed, which soaks more than three towels in a short period of time with blood seen flowing from the placental bed into the lower uterine segment, was regarded as severe blood loss needing surgical intervention. If the bleeding originated in the anterior part of the lower uterine segment, A long Allis forceps was introduced into the uterine incision and used to hold the cervix's anterior lip, drawing it upwards into the uterine cavity. Using continuous locking absorbable stitches, the anterior lip of the cervix was sutured to the anterior wall of the lower uterine segment (Vicryl no. 1). This helped to compress the placental bed bleeding sites and strengthen the very thin

lower uterine segment present in such cases. If the placenta was implanted posteriorly and the bleeding areas were primarily from the posterior wall of the uterus, the same procedure was repeated using the posterior lip of the cervix, and if the placental site bleeding was both anterior and posterior, we sutured the anterior and posterior lips all around. A Hegar dilator was placed retrogradely from the abdomen side to assure cervical canal patency during the suturing process. The bleeding was then noticed from both the abdominal and vaginal sides. Finally, the uterine incision was closed as usual.

Outcome measures: Cervical changes were postoperatively evaluated for position of the cervix, shape of the cervix, entrance of cervical os, fornices, cervical canal length, inner to inner diameter of the cervical canal and hysterosalpingogram image of the uterus.

Statistical Analysis:

Collected data was processed and analyzed using SPSS software program version 21. Quantitative data presented as mean \pm SD while Qualitative data presented as frequency distributions. Independent sample t test and chi square test were used for comparison p value of less than 0.05 considered as cut off for significance

Results:

Table 1: Mean gestational age was significantly ($p = 0.02$) higher among patients in group two without cervical advancement (36.9 ± 1.7) than those with cervical advancement (36.3 ± 1.3). There were no significant differences between the two groups regarding age or the number of previous deliveries.

Table 2: According to speculum examination, group 1, 13 cases have slit cervical os (19.7%), 5 cases have round cervical os (7.6%), 48 cases have pin point cervical os (72.7%), and in group two 24 cases have slit cervical os (36.4%), 2 cases

have round cervical os and 40 cases have pin-point cervical os (60.6%).

By sound examination of the cervix in group 1 with cervical advancement, 57 cases have easy entrance (86.4%), but in 9 cases there are difficulty during entrance the sound through the cervix (13.6%), but in group 2 without cervical advancement, all cases have easy entrance through the cervix with no difficulty.

Regarding fornices of the cervix in group 1, 19 cases have preserved fornices which can be felt (28.8%) and 47 cases have partial or complete obliterated fornices (71.2%), but in group 2, 66 cases have preserved fornices which can be felt (100%).

By hysterosalpingogram, in group 1, 59 cases are normal and accepted the contrast (98.5%) and 5 cases are abnormal (7.6%) as we failed to inject the contrast due to cervical stenosis, but in group two 66 cases are normal (100%).

Fig (1): Regarding position of the cervix in group 1, 20 cases have a central position (30.3%), in 19 cases the cervix is taken up and easily accessible (28.8%), but in 27 cases the cervix is taken up and difficult to access (40.9%). In group 2, all cases have a central position of the cervix

Table 3: shows a significant difference in cervical length and inner to inner diameter of the cervical canal. The mean cervical length in group 1 is 2.6 ± 0.6 cm but in group 2 is 2.8 ± 0.5 cm, and the mean inner to inner diameter of the cervical canal in group 1 is 0.7 ± 0.8 cm but in group 2 is 1.4 ± 0.08 cm.

Table 4: shows the complications recorded in our study in group 1 who were managed by cervical advancement technique ; 3 cases (4.5%) have wound infection , 3 cases (4.5%) have secondary post-partum hemorrhage, 6 cases (9.09%) have bladder injury, 1 case (1.5%) has ureteric ligation, and 5 cases (7.6%) have hematometra, but in group 2 there is no complication in 56 (84.8%) cases, 1 case (1.5%) has wound infection, 6 cases (9.1%) have secondary post-partum hemorrhage, and 3 cases (4.5%) have bladder injury.

Table 1: Characteristics of the pregnant women studied in the two groups:

Variables		With Cervical advancement Total =66	Without Total =66	p value
Age	Mean \pm SD	31.4 \pm 1.3	30.9 \pm 5.1	0.4
	Median	31	31.5	
Gestational age	Mean \pm SD	36.3 \pm 1.3	36.9 \pm 1.7	0.02*
	Median	37	37	
Number of previous deliveries	1	1(1.5%)	0	0.9
	2	9(13.6%)	7	
	≥ 3	56(84.8%)	59(89.4%)	
	Mean \pm SD	3.8 \pm 1.3	4.02 \pm 1	0.5
	Median	4	4	

Table (2): clinical data found in our follow-up in the two groups:

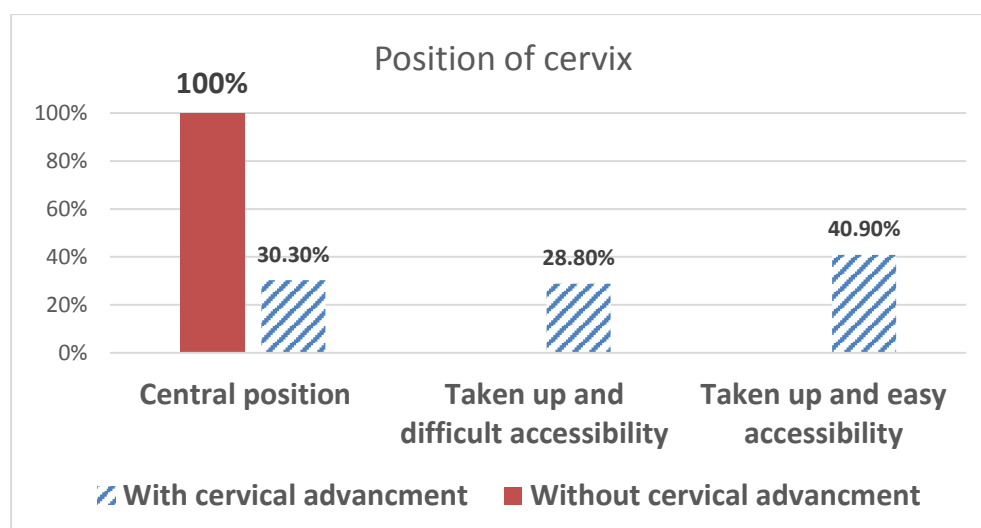
		With cervical advancement	Without cervical advancement	P value	
Shape	Slit	13(19.7%)	24(36.4%)		
	Round	5(7.6%)	2 (3%)		
	Pin point	48(72.7%)	40(60.6%)		
Sound examination	Easy entrance	57(86.4%)	66(100%)	0.002*	
	Difficult	9(13.6%)	0		
Fornices	Preserved	Felt	19 (28.8%)	0.0001*	
		Not felt	47(71.2%)		0
	Obliterated	Partial or complete	47(71.2%)	0	0.0001*
		No	19(28.8%)	66(100%)	
Hysterosalpingogram	Normal	61(92.4%)	66(100%)	0.0001*	
	Abnormal	5(7.6%)	0		

Table (3): Inner to inner diameter of the cervical canal and cervical canal length after intervention in the two groups:

		With cervical advancement	Without cervical advancement	P value
Cervical length	Mean \pm SD	2.6 \pm 0.6 cm	2.8 \pm 0.5 cm	0.01*
Inner to inner diameter of cervical canal	Mean \pm SD	0.7 \pm 0.8 cm	1.4 \pm 0.08 cm	0.008*

Table (4): post-operative complications after intervention in the two groups:

Post-operative complication	With Cervical advancement Total =66	Without cervical advancement Total =66	p value
No complication	48(72.7%)	56(84.9%)	0.001*
Wound infection	3(4.5%)	1(1.5%)	0.1
Secondary post-partum hemorrhage	3(4.5%)	6(9.1%)	0.3
Bladder injury	6 (9.09 %)	3(4.5%)	0.06
Ureteric ligation	1(1.5%)	0	0.3
cervical stenosis, fibrosis (hematometra)	5(7.6%)	0	0.02*

**Figure 1: cervix position after intervention in the two groups**

Discussion

Intraoperative cervical inversion as a tamponade for the management of intrapartum and postpartum hemorrhage is currently supported in various ways by a number of obstetric organizations. In a recent study, **Sakhavar** and his colleagues explain a slightly different technique. The cervix is inverted in the same manner as ours, and the placental bed is sutured to limit hemorrhage. The cervix is returned to its natural position once the bleeding has been stopped.^[10]

In a recent study done by **Mahmoud Alalfy** and his colleagues, who applied the Alalfy

modified cervical inversion technique as a tamponade, his study was actually conducted among a total of 240 pregnant women with placenta previa (120 subjected to the Alalfy modified cervical inversion technique plus hemostatic sutures and another 120 who were not subjected to cervical inversion and only subjected to hemostatic sutures at Suez Canal University Hospital, Kasr Alainy Hospital and Ain Shams University Hospital)^[8].

In a recent study done by **El Gelany** and his colleagues and **Elham H. Madny** and his colleagues, used the cervical inversion technique as a tamponade to control PPH of

placenta previa and accreta. The cervix is inverted in a similar way by the **Dawlatly** technique, after which the cervical lip is sutured to the lower uterine segment according to the site of bleeding.

Most previous studies have focused on the safety of the technique intraoperative to stop bleeding. Here, we describe for the first time the effect of the cervical advancement technique on the cervix postoperatively.

Regarding the number of previous caesarean deliveries (previous scars) in group one, one CS (25.8%) 17 cases, two CS (28.8%) 19 cases, 3 CS (27.3%) 18 cases, 4 CS (12.1%) 8 cases and 5 cs (6.1%) 4 cases, so we agree with **Silver RM et al.** as there is a dramatic increase in the incidence of placenta previa and placenta accreta due to the increasing rate of caesarean delivery^[11].

Following up on our cases three months later, speculum examination and per vaginal examination revealed that, regarding the external orifice of the cervix in group 1, 13 cases are slit in shape (19.7%), 5 cases are round in shape (7.6%), 48 cases are pin-point in shape (72.7%) and that is agree with **El Gelany** study. Speculum examination after 3 months revealed normal morphology of the cervix. Regarding position of the cervix, in the case group 20 cases (30.3%) the cervix is in the central position, 19 cases (28.8%) the cervix is taken up and difficult accessibility, and 27 cases (40.9%) the cervix is taken up and easy accessibility, and in the control group 66 cases (100%) the cervix was in the central position, and this is similar to **Alalfy et al.'s study**. **This is slightly different** from the postoperative follow-up of the cervix in **El-Gelany et al.'s study**, as speculum examination after 3 months revealed normal position of the cervix in 31 cases out of 40 cases. In two patients, the cervix was displaced upwards. Regarding cervical length, in the case group who were managed by cervical advancement technique, the mean cervical length was 2.6 ± 0.6 cm and in control group the mean cervical canal length was 2.8 ± 0.5 cm, and there was no significant difference, so that our follow up revealed that there is no significant difference in cervical length

between the case group with placenta accreta who were managed by cervical advancement technique and the control group who were managed by other hemostatic sutures, So that we excluded the major risk factor of pre term birth in these cases in the next pregnancy and this is similar to **Thain and his college** study, as in their study, the mean cervical length at period of (28–32 weeks) during their pregnancy was 2.43 cm in patients with a history of spontaneous preterm birth.

Regarding inner-to-inner diameter of the cervical canal, in the case group who were managed by cervical advancement technique is 0.7 ± 0.8 cm and in the control group, is 1.4 ± 0.08 with no statistically significant widening of the cervix, so we excluded cervical insufficiency from these cases. This is similar to the study by **Anthony et al.** which illustrates that a diagnosis of insufficiency is suggested if a woman has a history of mid-trimester loss and the cervical canal is wider than 8 mm in diameter.

Regarding **hysterosalpingogram**, in case group 61 cases (92.4%) are normal, 5 cases (7.6%) are abnormal, and in the control group 66 cases (100%) are normal. This is similar to **El Gelany et al.'s study** as office hysteroscopy was done and the cavity was normal with no evidence of intrauterine synechiae.

Regarding the complications encountered in our study as follows, in case study group, 4 cases had hysterectomy, 3 cases (4.5%) had wound infection, and in control group; one case (1.5%) had wound infection and this is similar to **Alalfy et al study** as 4 cases wound infection. In group one 3 cases (4.5%) secondary post-partum hemorrhage, 6 cases (7.5%) bladder injury and this is different from **El-Gelany study** as bladder injury in the two patients who had hysterectomy. In case group one case (1.5%) ureteric ligation, 5 cases (7.6%) cervical obstruction (hematometra), and this is different from **El-Gelany et al study** as in two patients, the cervix was displaced upwards. Colposcopic examination of the cervix in the two patients showed unremarkable findings. In the same sitting, office hysteroscopy was done and the cavity was normal with no evidence of

intrauterine synechiae in these two patients.

Conclusion: The currently evaluated technique of using the cervix as a natural tamponade to control intrapartum and postpartum hemorrhage caused by placenta accreta is apparently safe and effective. Cervical advancement doesn't affect the cervix negatively, as the cervix is in normal morphology and normal position, and there isn't any marked shortness of cervix or widening of the cervical canal. Further studies are needed with extended follow-up of the technique using colposcopy, hysteroscopy and histopathological correlation.

Acknowledgements: " to all the ladies who contributed with us to our current study"

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