

## Stepwise Devascularization and Resection of the Placenta with Adherent Uterine Wall. A New Effective Applicable Technique to Preserve the Uterus in Morbidly Adherent Placenta: Case Series

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### Abstract

**Background:** Morbidly adherent placenta is considered one of the most life-threatening obstetric complications and may cause severe intra operative bleeding requiring massive blood transfusion. The challenge is how to preserve the uterus with less complications?

**Aim of Study:** This study aimed to present an alternative applicable surgical technique to save the uterus in cases with MAP by application of stepwise devascularization and resection of the placenta with adherent uterine wall.

**Material and Methods:** It is a retrospective study in which 75 patients with morbidly adherent placenta, who delivered by cesarean section, were selected. Bilateral uterine artery ligation was done after downward dissection of the bladder, followed by upper uterine segment incision, downward stepwise clamping and resection of the whole lower uterine segment with adherent placenta till the cervix by vertical and transverse clamps. Finally reconstruction of the uterus was done. The amount of blood loss, operative time, post-operative hospital stay and operative complications were analyzed.

**Results:** In all cases the placenta was adherent to the lower uterine segment and involving the posterior wall of the bladder in four cases. In all cases the mean estimated blood loss was  $1156.3 \pm 403.2$  mL, the mean operative time was  $76.3 \pm 24.5$  min, and the mean post-operative hospital stay was  $3.8 \pm 1.6$  days. The four cases, in which the placenta was invading the bladder wall, underwent bladder repair due to bladder injury during dissection. In all cases, the uterus had been preserved. No other intra operative complications were reported.

**Conclusion:** Stepwise devascularization and resection of the placenta with adherent uterine wall is an effective and applicable technique to preserve the uterus in patients with morbidly adherent placenta with excellent operative results, less blood loss, blood transfusion was needed in limited cases.

**Key Words:** Morbidly adherent placenta – Placenta percreta-caserean hysterectomy.

### Introduction

**MORBIDLY** adherent placenta is considered one of the most life-threatening obstetric complications and may cause severe intra operative bleeding requiring massive blood transfusion with its related consequences, increased incidence of peripartum hysterectomy and high maternal mortality [1,2]. Recently, MAP is the greatest challenge in obstetric [3]. Good results and outcomes of MAP depend on early diagnosis and multidisciplinary planning for delivery [4]. MAP is classified into three important degrees according to the attachment of chorionic villi to the uterine wall and adjacent organs: It could be placenta accreta (chorionic villi are in contact with the myometrium), placenta increta (chorionic villi invade the myometrium) or placenta percreta (chorionic villi penetrate the uterine serosa). The most common involved extrauterine organ by placenta percreta is the bladder which is associated with morbidity and mortality of up to 10% [5]. The increased rate of cesarean delivery over the past 50 years is the leading cause of MAP [6]. In the last decades the rate of cesarean section has increased dramatically worldwide [7,8]. Many methods were reported to control bleeding in cases of MAP. Recently the role of interventional radiology also has been reported, for example, the use of prophylactic abdominal aorta balloon occlusion (PABO) [9]. In our study we present an applicable operative technique to control bleeding in cases of MAP by stepwise devascularization and resection of uterine wall with the adherent placenta. In this case series, the operative techniques, advantages and the results are discussed.

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### Patients and Methods

A retrospective study was carried out at Sohag University Hospital, Department of Gynecology and Obstetrics from June 2018-Jan. 2020. All 75 cases with MAP, who delivered by caesarean section were selected and these techniques were applied. The inclusion criteria of this study was as follows:

- 1- Morbidly adherent placenta was diagnosed by transvaginal Doppler ultrasonography and also was confirmed intraoperatively.
- 2- All cases had at least previous one cesarean section.
- 3- In all cases the uterus was needed on the patient demand after good counseling.

*Preparation of the patients preoperatively was as follow:* Written informed consent was obtained from all patients after counseling about the risks, complications of surgery and blood transfusion complications. Multidisciplinary team was recommended.

*Operative techniques were as follow:*

- 1- General anesthesia was used for all cases. Laparotomy through Pfannestiel incision, careful and meticulous dissection of the bladder till the end of the cervix distally was done to facilitate the further steps. In four cases, bladder was injured as the placenta invaded the posterior wall which was repaired by urologists.
- 2- The uterine incision was transverse above the upper border of the placenta based on preoperative ultrasound evaluation, avoiding incision through the placenta. Ecobolic drugs were given after rupturing of the amniotic membrane and delivery of the baby.
- 3- Bilateral uterine artery ligation was done also the placenta had not been removed at this stage.
- 4- At each angle of the uterine incision, downward stepwise vertical clamping of the lower uterine segment with the adherent placenta till the cervix was done followed by downward resection medial to the clamps.
- 5- Transverse clamp was applied at the cervix Fig. (1) followed by multiple transverse haemostatic sutures distal to this clamp to prevent the expected massive bleeding even if the cervix was invaded by the placenta. The whole placenta with the adherent uterine wall was resected at this stage after complete devascularization.

- 6- Reconstruction of the uterus was done by pulling the cervix upward and suturing with upward gradual withdrawal of the applied vertical clamps. Further hemostatic sutures were needed in numerous cases with lateral extension of the placenta.
- 7- Estimated blood loss in this study was done through the ordinary rules to calculate the amount of blood as follow:
  - A- The amount of blood in the suction device.
  - B- Gauze and dressing pads which were soaked by blood.

There was no need for admission in Intensive Care Unit (ICU) for any of the patients. The post-operative stay in the hospital was uneventful.

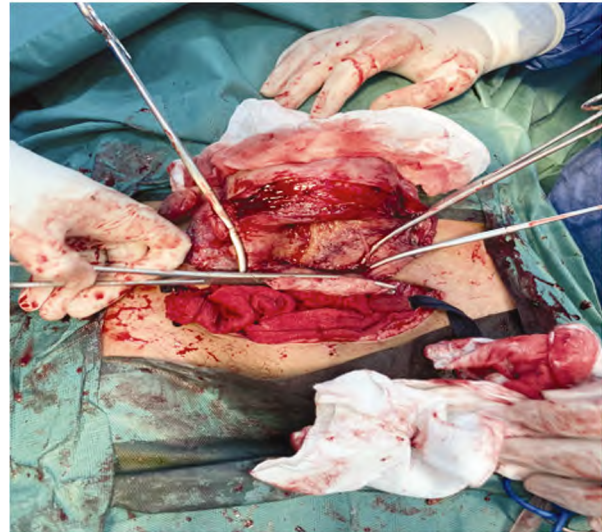


Fig. (1): Stepwise vertical and transverse clamping of the lower uterine segment with adherent placenta followed by its resection.

### Results

75 patients with Morbidly Adherent Placenta (MAP) were selected in this study; patient characteristics were demonstrated in (Table 1). The placenta was morbidly adherent in all cases based on Doppler transvaginal ultrasound which was also confirmed intraoperatively. The mean estimated blood loss during the surgery was  $1156.3 \pm 403.2$  mL, the mean operative time was  $76.3 \pm 24.5$  min, and the mean post-operative hospital stay was  $3.8 \pm 1.6$  days. In all cases the uterus had been preserved. Four cases had accidental bladder injury during dissection which was repaired. None of the cases were admitted to ICU. There were no reported complications other than the four cases of bladder injury. The post-operative period was uneventful during follow-up (Table 2).

Table (1): Patient characteristics.

Total number of cases	Age (yrs.) (Mean)	Gravidity (Mean)	Parity (Mean)	Gestational age (wks.) (Mean)	Number of previous CS (Mean)
75	26.8	3.7	2.7	35	2.4

CS: Cesarean Section.

Table (2): Intraoperative and post-operative data.

Case	EBL	Operative time (min)	Hospital stay (Days)	Hysterectomy	ICU admission	Complications Bladder injury
75	1156.3±403.2	76.3±24.5	3.8±1.6	0	0	4 cases (5.3%)

EBL: Estimated Blood Loss in the operation.

ICU: Intensive Care Unit.

### Discussion

Morbidly Adherent Placenta (MAP) is one of the obstetric nightmares nowadays and represents a life threatening event to the patients. MAP results from the abnormal attachment of the chorionic villi to the myometrium. There are three important degrees of morbidly adherent placenta according to its attachment to myometrium: Placenta accreta, placenta increta, placenta percreta. Placenta percreta is the most severe form as it penetrates through the whole thickness of myometrium. Massive blood loss may occur during operation of morbidly adherent placenta [10], as reported by some studies to be about 3630mL [11]. Multiple complications are associated with the operations of morbidly adherent placenta like massive intra operative and post-operative bleeding, atonic postpartum hemorrhage, and peripartum hysterectomy [12,13]. Morbidly adherent placenta is one of the leading causes of maternal deaths [14]. As regard many obstetricians, caesarean hysterectomy is the definite solution to save lives. We have another point of view in this issue, as in some operative situations hysterectomy is more hazardous than preservation of the uterus. During caesarean hysterectomy the dissection is more peripheral with possible associated complications like ureteric and vascular injury. Hysterectomy also can lead to disappointing physical and psychological trauma to the mother.

Many studies reported the relation between hysterectomy and premature ovarian failure due to affection of the ovarian blood supply. This contributes in lacking of the endocrine function, accelerated aging process and fear of losing femininity. In addition hysterectomy may lead to pelvic floor dysfunction due to damage of adjacent organs [15].

Sexual problems and depression resulted from hysterectomy also have been reported by some studies [16].

So the challenge is how we can preserve the uterus with safe methods.

Many papers were published [17], with cases of resection of the uterine wall and reconstruction.

Multiple techniques have been reported to improve the outcomes of morbidly adherent placenta and preserve the uterus; one of these techniques is triple procedure that consists of: Pre-operative placental localization, pelvic devascularization and myometrial excision then reconstruction of the uterine wall [1,2,18]. Another procedure similar to triple technique was reported in which pelvic devascularization was done by balloon catheter inside abdominal aorta instead of internal iliac arteries [19-21]. The previous two methods are time consuming and need interventional radiology pre-operatively with its possible associated complications. The availability of interventional radiology is difficult in comparable with our technique.

The attachment of the placenta to the lower uterine segment in placenta accreta is the leading cause of massive intraoperative bleeding due to uterine atony. Multiple conventional methods have been used to control bleeding in cases of morbidly adherent placenta as different types of hemostatic compressing sutures, embolic drugs and uterine packing. Recently the role of interventional radiology in management of morbidly adherent placenta by pre-operative insertion of aortic artery balloon has also been reported [22,23].

In our study we present an effective, safe and applicable operative technique to preserve the uterus in anterior morbidly adherent placenta with avoidance of the peripheral extension by vertical lateral clamping. Also, if the cervix is involved, massive bleeding can be avoided by transverse clamp at the cervical region with transverse hemostatic sutures distal to this transverse clamp, pulling up the cervix and finally reconstruction of the

uterus from downward upward. Bilateral uterine artery ligation in this procedure helps in the process of devascularization. Simply in our procedure (Khalifa Technique) we create a localized devascularized area of the placenta with its adherent uterine wall in which the expected bleeding will be under control Fig. (2).

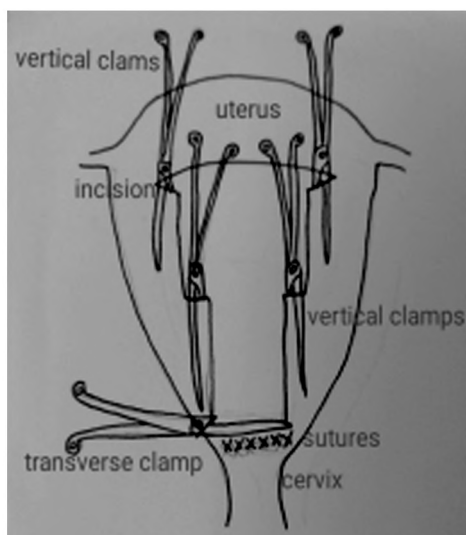


Fig. (2): Illustrative diagram for the discussed operative techniques.

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## قطع الإمداد الدموي للمشيمة وجدار الرحم الملتصق بها تدريجياً: طريقة مبتكرة وفعالة للحفاظ على الرحم في حالات المشيمة المتقدمة والملتصقة بجدار الرحم كلياً

المقدمة: تمثل المشيمة الملتصقة بجدار الرحم مشكلة كبيرة وخطيرة بسبب المضاعفات التي قد تنتج عن الجراحة وأهمها حدوث نزيف شديد وإحتمالية إستئصال الرحم. لذا يكمن التحدي هنا في كيفية الحفاظ على الرحم بأقل المضاعفات.

الهدف من العمل: تقييم طريقة جراحية مبتكرة وفعالة كبديل لإستئصال الرحم في حالات المشيمة المتقدمة والملتصقة بجدار الرحم كلياً.

المرضى وطريقة البحث: تم إختيار ٧٥ سيدة تعاني من مشيمة متقدمة وملتصقة بجدار الرحم كلياً واللاتى ولدن قيصريةً وأجريت تلك الطريقة الجراحية عن طريق قطع الإمداد الدموي للمشيمة وجدار الرحم الملتصق بها تدريجياً مع إستئصال جزء الرحم الملتصق بالمشيمة وإعادة إصلاح الرحم وإرجاعه إلى وضعه الطبيعي.

النتائج: في كل الحالات التي أجريت بواسطة تلك الطريقة تم الحفاظ على الرحم حيث كانت متوسط كمية الدم المفقود أثناء الجراحة حوالي ١٥٦ سم<sup>٣</sup> ومتوسط وقت الجراحة ٧٦.٣ دقيقة وكذلك متوسط عدد أيام الإقامة بالمستشفى بعد العملية ٣.٨ يوم ولم تسجل أى مضاعفات سوى إصابة المثانة البولية في أربعة حالات كانت فيها المشيمة ملتصقة بجدار المثانة وتم علاجها.

الخلاصة: قطع الإمداد الدموي للمشيمة وجدار الرحم الملتصق بها تدريجياً طريقة مبتكرة وفعالة ونتائجها ممتازة في الحفاظ على الرحم في مثل هذه الحالات.