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Ligation of a hypogastric artery in the management of placenta Previa and accrete

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ABSTRACT

Placenta previa and accreta are a high-risk condition causing high morbidity and mortality in obstetrics and may end with hysterectomy and blood transfusion. The current study was aimed to observe the benefit of ligation of bilateral internal iliac arteries [hypogastric arteries] in diagnosed cases of placenta accrete and previa and decreased rate of hysterectomy and blood transfusion in this cases. The present observational cohort study includes 50 pregnant women with placenta previa or placenta accreta with the previous history of cesarean sections. The study was conducted at the Gynecology Department, Al-Diwaniyah maternity and child teaching hospital, Al-Diwaniyah province, Iraq. All available cases during the period of study were undergone to internal iliac artery ligation after delivery of the fetus and before removal of the placenta, then the placenta was removed by the piecemeal manner and then hemostatic sutures to the site of the placenta to control bleeding was done. The results revealed the ligation of bilateral internal iliac artery in patients with placenta accreta and increase the rate of hysterectomy decrease and the need for blood transfusion also decreased. When we do bilateral internal iliac artery ligation in placenta, accrete we find it is an effective technique to reduce complications and decrease the rate of hysterectomy. While in cases of placenta previa accreta, ligation of the internal iliac artery did not become effective, and the main cases with placenta previa accreta end with hysterectomy.

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INTRODUCTION

Placenta previa occurs when the placenta covers the mother's cervix wholly or partially. In placenta previa, there may be severe bleeding during pregnancy and delivery. Placenta accrete is that occurs when placenta invades to the uterine wall. So after delivery of fetus part of the placenta or all of the placenta remain attached firmly to the uterine wall (Gielchinsky *et al.,* 2002) The symptoms included red vaginal bleeding without pain in the second half of pregnancy is a sign of placenta previa may be contraction occurred. Sometime diagnosis with placenta previa early in their pregnancies, the placenta previa change your position. When uterus grows, it might change the location of the placenta by increasing the distance between the cervix and the placenta. But in most of the cases of placenta previa which covers the cervix and the later in the pregnancy that it remains over the cervix, in rare cases, the placenta resolved. Placenta accrete often causes no signs or symptoms during pregnancy, but sometimes there is vaginal bleeding in the third trimester. Placenta accrete is detected during ultrasound (ACOG, 2002). The cause of placenta previa is not well known. Placenta accrete is thought to be related to a defect in the lining of the uterus due to previous a C-section or other uterine

surgery. This will allow the placenta to invade the uterine wall deeply. Sometimes placenta accreta occurs without a history of uterine surgery (Crowhurst *et al.,* 1999). Many factors can increase the risk of placenta accrete, including previous C-section or other uterine surgery. This type of surgery increase the risk of placenta accretes and the risk increase with the increasing number of this type of surgeries. Also, the previous placenta accretes increase the risk. Low lying placenta increase risk of placenta accrete (Silver, 2010). Placenta accrete more common in woman age more than 35. Ethnic groups of women less than Asian groups of women to have placenta accrete the causes is unknown. Also, the sex of fetus considers risk factor; women have male fetus is a slightly increased risk of placenta previa than women have female fetus (Miller *et al.,*1997). Complete placenta previa, the cervical is completely covered by the placenta. Partial placenta previa, the cervical os is partially covered by the placenta. Placenta accretes classify as placenta accrete when placental villi attached to myometrium but do not invade it. Placenta increta, the villi invade the myometrium (Daniel *et al.,* 2012). Placenta percreta, the villi reached to serosa of the uterus. When a placental position is low but not reach cervical is called low lying placenta. There are several hypotheses for aetiology; smoking thought to be increased risk of placenta previa. Uterine surgery increased the risk of placenta accrete because there may be damage to endometrium also incompletely developed or absent decidua basalis occur in placenta accrete (Sumigama *et al.,* 2007). Placenta accretes increased with placenta previa. While the cause of placenta pre via is unknown. Clinical presentation painless vaginal bleeding is the primary clinical presentation .in complete placenta previa more bleeding, while. In partial previa less bleeding if compared with complete previa. In most of the cases of placenta previa, the malpresentation is more common, and the presenting part is not engaged. (ACOG, 2002). Management of placenta accrete remain the more challenges in obstetrics and need multidisciplinary team [obstetrician, neonatology, anaesthetic haematologist, urologist, and general surgery] (Bell-Thomas *et al.,* 2003). It may have ended with hysterectomy, and we must discuss this option with her family. Incomplete placenta previa and the patient is stable. We do cesarean delivery at 35-36 weeks' gestation. (Shin *et al.,* 2005). The internal iliac artery is originated from the bifurcation of the common iliac artery. Passing downward to sciatic foramen then divides into two branches anterior and posterior. It lies posterior to the ureter and anterior to the internal iliac vein .it is medial to the external iliac vein. It is superior to the obturator nerve. Ligation of the internal iliac artery can be lifesaving in patients with massive uterine haemorrhage. The internal iliac artery supplies the walls and viscera of the pelvis, the buttock, the reproductive organ. And the medial part of the thigh. The vesicular branches of the internal iliac arteries supply the bladder. The indication of it is ligation is massive bleeding in cases of Placenta previa, abruption, and uterine atony, Placenta accreta, uterine rupture (Burchell, 1964).

PATIENTS AND METHODS

The present observational cohort study included includes 50 pregnant women with placenta previa or placenta accreta with the previous history of cesarean sections. The study was conducted at the Gynecology Department, Al-Diwaniyah Maternity and Child Teaching Hospital, Al-Diwaniyah province, Iraq. The study started on January 2015 and ended in January 2018. The Site of the placenta is diagnosed by ultrasound, and placenta accrete diagnosed by colour flow Doppler in the third trimester of pregnancy. Caesarian section was done at 37 weeks, but if there is vaginal bleeding, we can do caesarian section earlier. Written consent was obtained from the patients after talking with her about the risk of bleeding at the time of operation and postpartum, the need for blood transfusion and the hysterectomy may have needed to stop severe bleeding.

Inpatient with internal iliac artery ligation we see there is less amount of bleeding loss and decreased need for blood transfusion. In such cases, we need teamwork because it is high-risk cases [obstetrician, anastheses, haematologist, general surgeon, and urologist].

Statistical analysis

Statistical analysis was carried out using statistical package for social sciences (SPSS) version 23. Numeric variables were expressed as mean and standard deviation while categorical variables were expressed as number and percentage. ANOVA test was used to compare differences in mean values between the control and study groups. A p-value > 0.05 was considered as non-significant while a value of ≤ 0.05 was considered as statistically significant.

RESULTS

The study included 50 pregnant women with placenta previa (27), placenta accrete (15) and placenta previa with accrete (8) and with age of 29.5±5.2, 27.45±5.2 and 28.6±7.2 years, respectively, there was no significant difference in mean age between the three groups. Also, the statistical match between the three groups was also observed regarding the caesarian section, Gravity, and Antepartum haemorrhage.

Table 1: Characteristics of the control and study groups

Patient group	Uterine artery ligation	Hemostatic suture and mattress repair	Compression suture	Internal iliac artery ligation	Hysterectomy
Placenta Previa (27)	10.2±2.5	7.3±2.4	9.6±3.4	13.2. ±3.2	4.0±2.4
Placenta Accrete (15)	7.4±3.2	8.5±2.2	6.3±3.2	12.2±2.3	3.2±2.5
Placenta previa with Accrete (8)	4.3±2.4	5.3±2.3	2.3±1.4	6.2±1.8	5.3±2.2

Table 2: Procedure used in the management of placenta accreta

Patient group	Uterine artery ligation	Hemostatic suture and mattress repair	Compression suture	Internal iliac artery ligation	Hysterectomy
Placenta previa (27)	10.2±2.5	7.3±2.4	9.6±3.4	13.2. ±3.2	4.0±2.4
Placenta accrete (15)	7.4±3.2	8.5±2.2	6.3±3.2	12.2±2.3	3.2±2.5
Placenta previa with accrete (8)	4.3±2.4	5.3±2.3	2.3±1.4	6.2±1.8	5.3±2.2

Table 3: Complications of placenta previa and accrete

Patient group	Urinary tract injury	blood loss $(mm)^3$	Need for blood transfusion (u)	Hb% level post-operatively (g/dl)	haematocrit
Placenta previa (27)	2.3±1.2	1255±589	3.8±1.3	8.9±1.2	29.5±2.2
Placenta accrete (15)	3.0±1.6	950±550	2.2±1.2	9.2±1.0	29.7±2.1
Placenta previa with accrete (8)	3.5±1.5	1850±580	3.5±1.0	9.0±1.5	30.9±1.5

DISCUSSION

The placenta accretes increased in last years because of the increased rate of caesarian section. The cause of placenta previa is not well known. In our study, (table 1) the percentage of placenta accreta and placenta previa with an accrete increase in women with a history of CS and the incidence of placenta previa and placenta accrete increase with the increasing number of previous CS (Vedantham *et al.,* 1997). In table2 previously hysterectomy was the treatment of choice in placenta accreta, but this represents a problem for patients who want to get a child, so the alternative treatment includes uterine compression sutures, surgical uterine devascularization, oversewing of the placental vascular bed, embolization of the uterine vessels (Oyelese and Smulian, 2006). To reduce blood supply to uterus many of the procedures that have been developed such as surgical ligation of internal iliac artery or occlusion of the internal iliac artery by balloon or embolization of artery (Kidney *et al.,* 2001). Ligation of the internal iliac artery does not cause ischemia to the pelvic organ, but it decreases arterial blood flow pressure. To obtain the maximum decrease in pulse pressure in uterine circulation, we ligate the artery distal to the posterior branch (Alanis *et al.,* 2006).

This study was done by Burchell "s hemodynamic studies (Oyelese and Smulian, 2006, Alanis *et al.,* 2006). They found that ligation of internal iliac arteries the blood flow not so affected but the pulse pressure is decreased in high percent (Verspyck *et al.,* 2005). The collateral prevents tissue necrosis. In table 2 ligation of the internal iliac artery did not so useful In cases of placenta previa accrete and mostly ended with hysterectomy. We find bilateral internal iliac artery ligation before extraction of placenta accrete is an effective procedure to decrease complications and avoid hysterectomy (Rauf *et al.,* 2017). In table 3 urinary tract injury is more with placenta accrete and placenta previa with accrete (Maher and Abdelaziz, 2017). The

blood loss and requirement for blood transfusion are more in placenta previa and accrete, and blood loss and the requirement for blood transfusion is a decrease in placenta accrete when doing internal iliac artery ligation. In placenta previa with accrete, ligation of the internal iliac artery has no significant effect in the amount of blood loss and requirement of blood transfusion (Fitzpatrick *et al.,* 2014, Joshi *et al.,* 2007).

CONCLUSION

Placenta accretes or increta is a high-risk hemorrhagic condition that carries a high rate of maternal morbidity and mortality. Bilateral internal iliac artery ligations before removal of placenta accrete seemed to be an effective and safe technique to decrease intrapartum and postpartum complications and to avoid emergent peripartum hysterectomy. In cases of placenta previa accrete, ligation of the internal iliac artery did not significantly contribute to hemostasis during cesarean hysterectomy.

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