Prophylactic Internal Iliac Artery Ligation in cases of Placenta Previa Accreta; Randomized Controlled Trial

Thesis
Submitted for Partial Fulfillment of the MD Degree
In Obstetrics & Gynecology

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List of Abbreviations

ACOG	:	American college of obstetricians and gynecologist
ALT	:	Alanine aminotransferase
AST	:	Aspartate aminotransferase
CEACAM1	:	Carcinoembryonic antigen-related cell adhesion molecule 1
CIA	:	Common iliac artery
CRH	:	Corticotrophin releasing hormone
CS	:	Cesarean section
EGF	:	Epidermal growth factor
EIA	:	External iliac artery
EPH	:	Emergency peri-partum hysterectomy
EVTs	:	Expressed in extravillous trophoblasts
HCG	:	Human Chorionic Gonadotrophin
ICU	:	Intensive care unit
IIA	:	INTERNAL iliac artery
IIAL	:	Internal iliac artery ligation
IQR	:	Inter quartile range
MNGCs	:	Multinucleated giant cells
MSAFP	:	Maternal serum alpha-fetoprotein
PPH	:	Post-Partum Hemorrhage
PPROM	:	Preterm premature rupture of membranes
RBCs	:	Red blood cells
RCOG	:	Royal College for Obstetricians and Gynecologists
SOGC	:	The society of obstetricians and gynecologists of Canada
SPSS	:	Statistical program for social science
TNF	:	Tumor necrosis factor

List of Abbreviations (Cont.)

TRAIL-R2	:	TNF-related apoptosis-inducing ligand receptor-2
US	:	Ultrasound
VEGF	:	Vascular endothelial growth factor

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ABSTRACT:

Objective: Assess short term safety and efficacy of prophylactic bilateral ligation of anterior division of internal iliac artery in reducing blood loss from placental and non-placental site in patients undergoing C.S diagnosed with placenta previa accreta.

Study design: A prospective, randomized, case control trial.

Study setting: Ain Shams University Maternity Hospital.

Patients: A total number 96 pregnant women were diagnosed as placenta accretra, were enrolled in the study; 45 recruited to group A, wile 51 patient were recruited to group B.

Results: The results obtained from the study revealed no statistically significant difference between group A and group B as regard estimated blood loss. The mean blood loss in group A was 1987 ml, while it was 1931 in group B with p value: 0.365, there also no statistically significance between preoperative and postoperative HB and hematocrit values.
As regard the secondary outcomes, like blood pressure, blood transfusion, caesarean hysterectomy, ICU admission, coagulopathy, organ injury, wound sepsis and hospital stay after surgery all had no significance.

Conclusion: Although prophylactic bilateral ligation of the internal iliac artery in cases of placenta accreta in this trial showed no significance. Bilateral ligation of the internal iliac artery still life saving procedure in cases of uncontrollable pelvic bleeding in cases of placenta accreta, but it shouldn't be routinely applied in cases of placenta accreta as Cesarean hysterectomy is currently became the reference standard treatment for placenta accreta.

Key words: Placenta Previa Accreta, Internal Iliac Artery Ligation.

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INTRODUCTION:

Placenta previa refers to the abnormal implantation of the placenta in the lower uterine segment, overlying or near the internal cervical os **(El sayes et al., 2009).**

Adherent placenta, including placenta accreta occurs when the trophoblastic villi invade beyond the normal confines of the decidua (**Florence et al., 2007).** Placenta percreta is associated with a maternal mortality as high as 10% and significant maternal morbidity (**Bennett et al., 2003).**

The incidence of morbidly adherent placentas has increased ten-fold in the past 50 years, currently occurring at a frequency of 1 per 1000–2500 deliveries **(ACOG, 2002).** It may lead to massive obstetric hemorrhage resulting in complications such as disseminated intravascular coagulopathy, need for hysterectomy, surgical injury to urinary tract and other viscera, adult respiratory distress syndrome, renal failure and even death **(Hudon et al., 1998).**

It is a major cause of obstetric hemorrhage and is thus associated with significant maternal and fetal mortality, estimated to be 6–7% and 9–19%, respectively (**Andrew et al., 2011)**.

Factors associated with higher incidence of placenta accreta include: multiparty, prior uterine surgery such as myomectomy, previous cesarean section and curettage, advanced maternal age, exposure to pelvic irradiation (**Gielchinsky et al., 2004).**

Prenatal diagnosis of placenta accreta is typically based upon the presence of characteristic findings on ultrasound examination it is one most useful modalities for evaluating placental position and implantation, (**Warshak et al., 2006),** Color Doppler also has specific findings on color that suggest placenta accreta **(Chou et al., 2000).**

Magnetic resonance imaging can be more useful especially: evaluation of a possible posterior placenta accreta and assessment of the depth of myometrial and parametrial involvement, and, if the placenta is anterior, bladder involvement (**Derman et al., 2011).**

Recognition of the high morbidity and mortality associated with morbidly adherent placenta requires multidisciplinary approach. The interventional radiologist, the anesthetist, the neonatologist and an experienced consultant obstetrician play crucial role. Particular considerations should be given to the anticipation and management of massive hemorrhage, including availability of pack RBCs, platelets, fresh frozen plasma, cryoprecipitate etc… **(Yap et al., 2008).**

Previous reviews advised against attempts at placenta removal before hysterectomy, Antenatal diagnosis, scheduled cesarean hysterectomy without attempts at placental removal reduce maternal morbidity **(Oyelese and Smulian, 2006).**

The Strategies of conservative management and preservation of fertility include leaving the placenta after cesarean delivery with surgical uterine devascularization, embolization of the uterine vessels, uterine compression sutures and / or over sewing of the placental vascular bed

followed by close observation and antibiotic (**Ojala et al., 2005).**

Pelvic hemorrhage, whether postpartum or related to surgery, is associated with a great degree of morbidity and mortality and has to be controlled immediately without compromising the rest of the pelvic blood supply. Ligation of the internal iliac arteries, a time tested easy method achieves that goal **(Mayur and Gunvant, 2013).**

An emergency bilateral internal iliac artery ligation (IIAL) is a highly effective, simple and a safe surgical procedure for controlling the pelvic hemorrhage in gynecology and obstetrics patients. It is a lifesaving procedure which preserves the reproduction capacity by avoiding hysterectomies in such situations. An emergency bilateral IIAL is indicated mainly in the postpartum hemorrhage which is due to the atony of uterus rather than due to an obstetric trauma. However, some have reported the useful use of bilateral IIAL in patients with ruptured uteri and placenta accreta **(Kalburgi et al., 2012).**

Preoperative placement of internal iliac artery occlusion balloon reduces the intra-operative blood loss and transfusion requirements of patients with placenta accreta and its variants undergoing cesarean delivery **(Darwish H et al., 2014)**.

Hemodynamics of pelvic organs after hypogastric artery has been extensively studied as early as the mid-1960s, Human experimentations in non-pregnant women demonstrated that ligation of the internal iliac arteries causes profound hemodynamic changes in the female

pelvic circulation The net effect of internal iliac artery ligation is a transformation of the pelvic circulation into a venous system. Venous bleeding can usually be controlled by temporary pressure, so that a blood clot could form at this site and has a good chance of remaining there **(Sziller et al., 2007)**.

Follow-up studies in patients who became pregnant after hypogastric artery ligation demonstrated that the circulation in the uterine arteries in subsequent pregnancies remains intact **(Sziller et al., 2007)**.

Possible complications after surgical ligation of the hypogastric arteries include direct injury of the iliac vessels and the surrounding anatomic organs**,** Hypoxemic injury of pelvic organs has been reported rather in patients undergoing uterine artery embolization with small size particles that might occlude fine distal branches of the arterial tree (**Cottier et al., 2002).**