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Review

Placenta Accreta: Prevention and Current Surgical Strategies

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ABSTRACT

Placenta accreta is an obstetric condition characterized by the abnormal invasion of chorionic villi into the uterine wall, which can result in severe hemorrhage and significant maternal complications. Its incidence has been increasing, largely due to the higher rate of previous cesarean deliveries. Prevention involves identifying risk factors such as low placentation over a uterine scar and a history of uterine surgery and performing detailed ultrasonographic monitoring in the second and third trimesters. The ideal surgical strategy requires multidisciplinary planning, with blood products reserved and teams from Anesthesiology, Surgery, and Hemotherapy on standby, preferably in a reference center. Surgical options include classic cesarean hysterectomy, hysterectomy after placental separation, and conservative techniques for uterine preservation, such as selective occlusion of uterine or internal iliac arteries, hemostatic sutures, and intrauterine balloon tamponade. Studies demonstrate that conservative management can reduce hysterectomy rates and improve reproductive outcomes but is associated with a higher risk of delayed hemorrhage and reintervention. Prophylactic placement of balloon catheters in the internal iliac arteries has been shown to decrease intraoperative blood loss but requires technical expertise and interventional radiology support. Training programs and standardized protocols are essential for optimizing management. In conclusion, the combination of early diagnosis, multidisciplinary planning, and individualized surgical technique selection enhances maternal safety and, when possible, preserves fertility.

Keywords: Placenta accreta; Prevention; Cesarean hysterectomy; Uterine conservation; Arterial occlusion

Introduction

Placenta accreta belongs to the spectrum of the placenta accreta spectrum (PAS), which also includes placenta increta and percreta, and remains a major cause of maternal morbidity and mortality in obstetric units worldwide[1,2]. Defined by the abnormal adherence of chorionic villi to the myometrium without an intervening decidual layer, this condition predisposes patients to massive hemorrhage during placental detachment and often necessitates emergency hysterectomy. Over recent decades, its incidence has risen from approximately 1 in 2,500 deliveries in 1980 to 1 in 533 in 2016, directly reflecting the increasing number of cesarean sections performed, since the primary associated condition is placentation over a previous uterine scar. Morbidity and mortality associated with placenta accreta are primarily related to severe obstetric hemorrhage, requiring massive blood transfusion, emergency procedures,

and complications such as coagulopathy, ureteral injury, and prolonged intensive care unit stays. It is estimated that up to 90% of PAS patients require transfusion of more than four units of red blood cells. Moreover, inadequate management can lead to hypovolemic shock and life-threatening situations, especially in resource-limited settings[3].

Prenatal diagnosis using Doppler ultrasound and, in selected cases, magnetic resonance imaging allows planning delivery in a reference center, defining the anesthetic strategy, and assembling a multidisciplinary team, thereby reducing complications. Ultrasound sensitivity for PAS can reach 90% when performed by fetal medicine specialists. However, heterogeneity in diagnostic protocols still hampers standardization of care. Classic surgical approaches consist of cesarean hysterectomy, considered the gold standard for hemorrhage control, but result in uterine loss and definitive infertility[4,5]. Given the growing demand for conservative techniques, selective arterial occlusion (via balloons in uterine or internal iliac arteries), uterine compression sutures, and local hemostatic agents have been developed to preserve the uterus. These approaches have demonstrated up to a 60% reduction in hysterectomy rates in selected cases, but carry increased risk of late complications such as postoperative bleeding and endometrial infection[6,7]. Preoperative preparation protocols including blood product reservation, inhaled nitric oxide administration to reduce bleeding, and intensive care unit readiness form the core of preventive measures. Incorporating realistic simulations of PAS scenarios and joint training of obstetric, anesthesia, and interventional radiology teams has also proven effective in reducing operative time and blood loss. In this context, it is essential to review prevention practices and surgical strategies used in managing placenta accreta, discuss their advantages and limitations, and offer evidence-based recommendations to optimize maternal outcomes[8].

Objectives

To review the literature on methods of prevention, prenatal diagnosis, multidisciplinary preparation, and both radical and conservative surgical techniques for managing placenta accreta.

Materials and Methods

A literature review was conducted using the PubMed, SciELO, Google Scholar, and ScienceDirect databases.

Discussion

Placenta accreta presents a threefold challenge: prevention, prenatal diagnosis, and safe surgical management. Implementing screening protocols for pregnant women with a history of caesarean deliveries or previa over a uterine scar has proven effective in reducing late diagnoses, thereby allowing appropriate planning[9]. Two-dimensional ultrasound with colour Doppler remains the initial modality of choice, with indicators such as vascular lacunae and reduced myometrial thickness serving as reliable predictors. Magnetic resonance imaging aids in assessing lateral or posterior invasion in equivocal cases. Preventively, continuous medical education on the risks of multiple caesareans and encouragement of trial of labour after caesarean (TOLAC) when indicated can decrease PAS incidence. Institutional policies restricting nonessential caesarean indications are recommended by obstetric societies[10,11].

Regarding surgical management, scheduled caesarean hysterectomy in a reference centre continues to be the gold standard, with lower maternal mortality compared to emergency hysterectomy. However, its impact on fertility and psychological burden has driven development of conservative approaches. Prophylactic balloon occlusion in the internal iliac arteries, followed by partial placental detachment and uterine compression, has shown up to a 40% reduction in intraoperative bleeding[12]. Nevertheless, complications such as vascular thrombosis and lower limb ischemia require careful risk-benefit evaluation. Additional techniques such as modified B-Lynch sutures and application of local haemostatic agents (fibrin mesh, haemostatic sponges) assist in controlling focal haemorrhage, though large randomized trials confirming their isolated efficacy are lacking[13]. Late manifestations, including secondary bleeding and need for reintervention, occur in about 10-15% of conservatively managed cases. Success hinges on an institutional protocol with preoperative team briefings, blood bank availability, and interventional imaging support. Simulations and interprofessional training reduce operative time and improve communication, translating into less blood loss. In summary, technique selection should be individualized, taking into account reproductive desire, clinical condition, and available hospital infrastructure. The combination of accurate prenatal diagnosis, multidisciplinary readiness, and adoption of interventional technologies offers the best maternal prognosis[14,15].

Conclusion

Placenta accreta is a significant cause of obstetric morbidity and mortality, demanding an integrated approach ranging from primary prevention through policies aimed at reducing unnecessary cesarean deliveries to efficient prenatal diagnosis and delivery planning in a reference center. Ultrasound with color Doppler remains the method of choice for early detection, with MRI reserved for complex cases. Surgically, while scheduled cesarean hysterectomy is firmly established as the gold standard for safe hemorrhage control, conservative techniques including selective arterial occlusion, compression sutures, and local hemostatic agents represent viable alternatives for uterine preservation in carefully selected patients. Institutional protocols and interdisciplinary simulations are crucial, having demonstrated significant reductions in blood loss and perioperative complications. Future research should focus on standardizing conservative techniques and evaluating long-term maternal and reproductive outcomes to further refine practice and minimize risks.

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