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PICTURE OF THE MONTH

New Important Step in Prenatal Evaluation of Abnormally Invasive Placenta: A Study of Bladder, Uterus, and Vagina Vascularization

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ABSTRACT

Abnormally invasive placenta (AIP) are increasing pathologies, but not always they present the same difficulties during surgery. So a presurgical step before to assess a cesarean section in pregnancies with AIP is the evaluation of the vascular anastomotic system between the bladder, uterus, and vagina involving the superior, medial, and inferior vaginal and the lower vesical arteries. This is fundamental to plan the management of eventual surgical complication and to predict perisurgical and postsurgical outcomes.

Keywords: Abnormally invasive placenta, Accretism, Bladder-uterus-vagina vascularization, Morbidity adherent placenta, Obstetric surgery, Prenatal evaluation.

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INTRODUCTION

Abnormally invasive placenta (AIP) encompasses a wide spectrum of conditions characterized by progressive invasion of trophoblastic tissue into the myometrium and serosa. Considering the histopathological aspect, to realize this, it is necessary improving the vascularization, thanks to the increase in production of antigenic factors that lead to massive enlargement of these vessels, which turn into high-flow and low-resistance reservoirs. In this way a rich vascular network of anastomoses is made, which in normal conditions are microscopic and unimportant.

Where do these anastomoses come from? It is conventionally asserted that uterine circulation is provided mainly by the uterine arteries and secondarily by anastomotic flow of the ovarian arteries. However, and according the Palacios Jaraquemada's theory, it would be difficult to explain how is possible to maintain the uterus' flow after a complete occlusion of its main branches (uterine arteries), and sometimes even after occluding the tubal-ovarian branches. So we can establish that, in some circumstances, the uterine circulation is supplied by the flow coming from the vaginal pedicles.[1]

In fact, high degrees of AIP are sometimes characterized by the presence of a rich vascular anastomotic system between the bladder, lower uterus segment, and vagina (BUV) involving the superior, medial, and inferior vaginal and the lower bladder arteries.[2]

This vascular system consists of upper, middle, and lower pedicles: A cephalic one constituted by the uterine artery, a medial one made up by the cervical artery, and a distal one formed by the vaginal arteries. All types of anastomoses showed similar features and were interconnected along the isthmic-vaginal borders, or as an intramural anastomotic network.

Even though the vaginal arteries have different trunk origins (uterine artery, iliac artery, internal pudendal artery), there is no doubt about the role of the vaginal pedicles in uterine arterial blood supply.

Therefore, in order to realize an optimal and safe surgical treatment, mapping the BUV vascularization is essential, to avoid certain complications reported in the literature after uterine embolization, like bladder and vulvar ischemic events.

RESULTS

We report the feasibility of ultrasound evaluation of BUV anastomoses referred for suspicion of AIP (Fig. 1).

On conventional two-dimensional (2D) ultrasound, all considered patients had the classic markers of AIP, such as intraplacental lacunae, loss of the hypoechoic space between the bladder and the myometrium, and an interrupted hypoechoic space between the placenta and myometrium.

All patients were evaluated in their 2nd and 3rd trimesters of pregnancy using 2D gray-scale, color Doppler, and three-dimensional power Doppler ultrasound. In order to evaluate the vascular supply to the lower uterine segment, transvaginal scans were arranged. Sagittal images showing the lower uterine segment, a partially full bladder, and the vagina.

The presence of these anastomotic connections were also visualized via axial views through the vaginal

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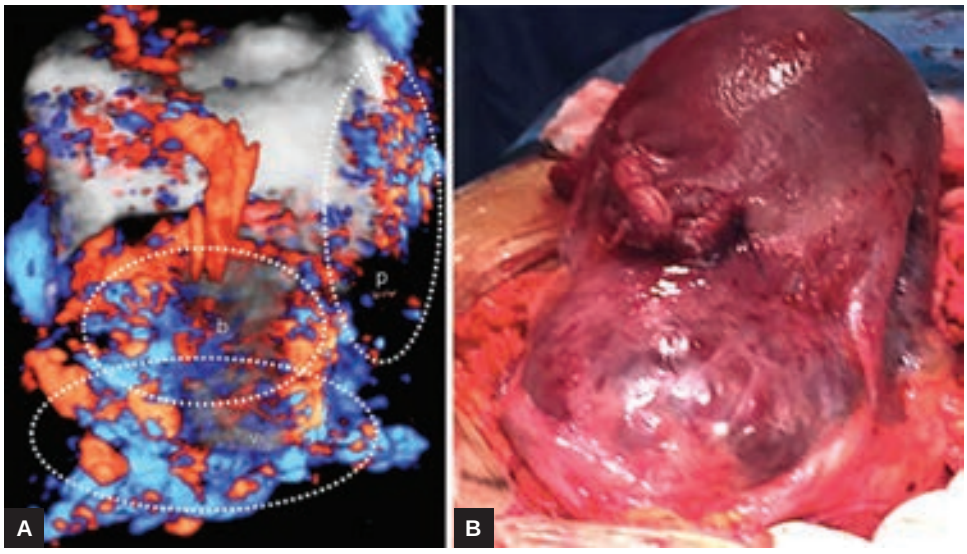

Figs 1A and B: (A) Three-dimensional power Doppler image showing irregular and tortuous neovascularization of the BUV system and (B) surgical view after cesarean delivery; P: Parameter; B: Bladder; V: Vagina

fornices, showing diffuse pericervical vascularization with multiple anastomotic connections extending superiorly to the bladder and inferiorly through the vagina.[2]

All women were undergone to a hysterectomy procedure, and all of them had histopathological confirmation of placental accretism.

CONCLUSION

The prenatal ultrasound scans of BUV anastomoses should be part of the evaluation of pregnancies complicated by AIP, because it gives an important help for interventional radiologists avoiding failures, complications, and hemodynamic changes during and after uterine devascularization procedures and it is also important in predicting maternal outcomes.

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