H16 Rapid Unexpected Death in Late Pregnancy Due to Ruptured Iliac Artery Dissection

Julia Choi, 22 S Greene Street, Baltimore, MD 21201; Stephanie M. Richards, University of Maryland School of Medicine, 655 W Baltimore Street, Baltimore, MD 21201; Christine Yoo, University Maryland Medical Ctr, Dept of Pathology, 22 S Greene Street, Baltimore, MD 21201; and Allen Burke, MD, University of Maryland School of Medicine, 22 S Greene Street, NBW51, Baltimore, MD 21201*

The goal of this presentation is to introduce a case report and associated literature review which will provide the attendees with a better understanding of the incidence of arterial dissections during pregnancy and the postpartum period as well as the potential hemodynamic and hormonal causes of such dissections.

This presentation will impact the forensic science community by providing attendees with increased competence in identifying arterial dissections that may cause morbidity and mortality in pregnancy and the postpartum period. This presentation will also caution attendees to look for arterial dissections in cases of unexpected death in pregnancy and the postpartum period.

Arterial dissections associated with pregnancy and the postpartum period have been reported since before the Civil War. The most common sites are the aorta and the cerebral and splenic arteries. The etiology is unclear but likely due to a combination of hemodynamic and hormonal changes. A case of sudden death due to a ruptured iliac dissection in late pregnancy is presented.

A 32-year-old woman in the third trimester of pregnancy presented to the emergency department in hemorrhagic shock. A computerized tomography scan showed a retroperitoneal hemorrhage. While in the operating room, a linear transmural disruption was identified at the right iliac artery bifurcation. The patient expired during the procedure before vascular repair could be performed. An autopsy was performed and confirmed a right iliac artery dissection. Histological sections of the artery showed medial degenerative changes.

The causes and risk factors of pregnancy-associated arterial dissection are unclear. Traditional risk factors for arterial dissection include hypertension, atherosclerosis, pre-existing aneurysm, extreme physical exertion, and trauma. Systemic diseases can also predispose patients to arterial dissections. None of these risk factors were present in this patient. Rather, the majority of women with pregnancy-associated dissections were otherwise healthy, without a history of trauma, and with normal peripartum blood pressures.[1,2]

It has previously been suggested that the physical pressure and hemodynamic stresses from the gravid uterus may contribute to dissections related to pregnancy.[1] This may be a contributing factor in iliac dissections; however, the majority of dissections occur above the diaphragm (aorta and cerebral arteries) and cannot be fully explained by this hypothesis.

Most dissections occur in the third trimester or the postpartum period and not during labor, suggesting that the stress and exertion associated with labor is not the cause of arterial dissections. In one study, there was no correlation between dissection and the length of the second stage of labor.[2] One case of aortic dissection occurred in a patient who underwent an elective cesarean section with no active laboring.[3] These support the idea that the stresses of labor are not the cause of arterial dissections.

The most promising hypothesis involves hormonal changes that may contribute to alterations in the arterial walls, which increase the risk for aneurysms and dissection. The histologic changes described in dissecting arteries in pregnancy include fragmented reticulin fibers, alterations in the amount of acid mucopolysaccharides, loss of normal corrugation of elastic fibers, and smooth muscle hypertrophy.[3,4] Comparable changes have been observed in pregnant women without clinical dissection, suggesting that these arterial alterations are due to hormonal changes in pregnancy.[5]

The mechanism for pregnancy-associated arterial dissections is unknown; however, this is a serious problem that can lead to significant morbidity and mortality if not properly diagnosed. Further research needs to be undertaken to determine other potential risk factors and to aid in early detection of such dissections.

References:

1. Pedowitz P, Perell A. Aneurysms complicated by pregnancy, part I: aneurysms of the aorta and its major branches. *Am J Obstet Gynecol*. 1957; 73: 720-35.
2. Kelly JC, Safain MG, Toguski M, Edlow AG, Malek AM. Postpartum internal carotid and vertebral arterial dissections. *Obstet Gynecol*. 2014; 123: 848-56.
3. Nolte JE, Rutherford RB, Nawaz S, Rosenberger A, Speers WC, Krupski WC. Arterial dissections associated with pregnancy. *J Vasc Surg*. 1995;21(3): 515-20.
4. Konishi Y, Tatsuta N, Kumada K, Minami K, Matsuda K, Yamasato A, Usui N, Muraguchi T, Hikasa Y, Okamoto E, Watanabe R. Dissecting aneurysm during pregnancy and the puerperium. *Jpn Circ J*. 1980;44(9):726-33.
5. Manalo-Estrella P, Barker AE. Histopathologic findings in human aortic media associated with pregnancy. *Arch Pathol*. 1967;83(4):336-41.

Arterial Dissection, Pregnancy, Iliac Artery