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RESEARCH ARTICLE

RUPTURED RENAL ARTERY ANEURYSM: A RARE CAUSE OF SHOCK IN PREGNANCY

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ABSTRACT

Renal artery aneurysm accounts for 1% of all aneurysms. Pregnancy is a predisposing condition for aneurysm formation and rupture. Our aim is to reinforce the presence of this rare condition as a cause of hypovolemic shock in pregnancy. With this aim, we present a case of a female who presented to us with this rare entity. The diagnosis of renal artery aneurysm during pregnancy remains elusive due to its rare occurrence and non-specific presentation. A high degree of vigilance and prompt treatment is required to salvage the lives of both mother and fetus.

KEY MESSAGE: The diagnosis of renal artery aneurysm during pregnancy remains elusive due to its rare occurrence and non-specific presentation. Our aim is to reinforce the presence of this rare condition as a cause of hypovolemic shock in pregnancy. It is never thought of as a cause of hemorrhagic shock during pregnancy. We wish to make obstetricians aware of this condition as a differential diagnosis in such cases.

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INTRODUCTION

Aneurysm is a focal dilatation of artery as a result of weakness in arterial wall. 1% of all aneurysms are in the renal artery (Karsten *et al*., 2005). Although pregnancy related hormonal changes, hemodynamic circulation and an increase in intra-abdominal pressure predisposes to rupture of aneurysm, rare occurrence and non-specific presentation makes diagnosis difficult resulting in high maternal and fetal mortality.

Case summary

A 23years old, booked G3P1L1A1 female presented to the emergency at 36weeks with complaints of acute pain in right lower abdomen, severe back ache and fainting attacks for one day. There was no associated history of trauma, fever, labor pains, leaking or bleeding per vaginum. She had one spontaneous abortion 3 years back and a cesarean section done for breech presentation 2 years back. She was markedly pale with tachycardia 120 beats per minute and BP 80/60 mm Hg.

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On per abdominal examination there was generalized tenderness, uterus corresponded to 36 weeks size with cephalic presentation and fetal cardiac activity was absent. On per vaginum examination cervix was closed and uneffaced. There was no leaking or bleeding per vaginum. A provisional diagnosis of rupture uterus or abruptio placenta was made and she was taken for emergency laparotomy. On laparotomy 300ml of hemoperitoneum was present; the uterus was intact but very pale. A fresh still born was delivered with meconium stained liquor. There was no evidence of placental abruption. A large retro peritoneal hematoma was seen on right side extending from just below the diaphragm to the caecum crossing the midline. It was non-expanding and no pulsations were felt through it. A decision for conservative management was taken in conjunction with the general surgeon and the abdomen was closed after placing an intra-peritoneal drain. Post operatively her blood pressure had stabilized and she received 3 units of blood transfusion. A re-laparotomy was done 8 hours after surgery due to collection of 1L frank blood in the drain and fall in BP and hematocrit. On re- laparotomy slight expansion of retroperitoneal hematoma was seen. The posterior peritoneum was opened, but since no active bleeding was seen abdomen was closed. Patient received 4 units of packed cells and 4 units of FFP, her vitals remained stable and a progressive fall in drain output was observed. On day 2 a CT

angiography was done on which a ruptured renal artery aneurysm was seen with a large retroperitoneal hematoma (Fig. 1). Patient subsequently underwent aneurysm repair in conjunction with vascular surgeons.

DISCUSSION

Renal artery aneurysm is defined as dilated segment of renal artery that exceeds twice the diameter of a normal artery. The incidence of renal artery aneurysm in general population as reported on autopsies is 0.09% -0.1% (Stanley *et al*., 1975). In patient undergoing renal artery angiography the incidence is 0.3% - 2.5%, which is due to the selective population they represent (Schom *et al*., 1997). Renal artery aneurysm is more common in females and on the right side, except in pregnancy where it involve the left renal artery more commonly (Smith *et al*., 1985). Renal artery aneurysm can be congenital or acquired. The predisposing factors for rupture of RAA are size >2cms, incomplete calcification, hypertension, trauma and pregnancy. The hormonal changes of pregnancy lead to morphological and biochemical changes in vessel wall leading to weakness. Pregnant uterus dislodges and compresses abdominal aorta and inferior vena cava, shifting them posteriorly to the left. These along with hyper dynamic circulation of pregnancy are implicated in the etiology of aneurysm formation and rupture. A symptomatic RAA most commonly presents as abdominal pain, flank pain, difficult-to-control hypertension, hematuria and renal infarct. A ruptured RAA usually presents as severe back ache, fainting attacks and hypovolemic shock, which are confused with other more common causes of hemorrhagic shock during pregnancy, such as abruptio placenta and ruptured uterus.

Renal artery aneurysm usually ruptures during late second and third trimester. There are three reported case of renal AA in postpartum period, two ruptured (Hwang *et al*., 2011 and Pliskin *et al*., 1990). while one was diagnosed intact at 8 weeks postpartum (Soliman *et al*., 2006). In the 12 published reports of ruptured RAA in pregnancy before 1970, fetal mortality was 100% and maternal mortality was 92% (Lumsden, 1996). Development in vascular surgery and intervention radiology has caused marked reduction in maternal and fetal loss ever since. An asymptomatic RAA does not warrant any intervention. The advocated indications for operative intervention are size >2.5 cms, symptomatic or enlarging aneurysm, renal embolism, aneurysm in females planning a pregnancy or are pregnant and renovascular hypertension. Various treatment modalities available for ruptured RAA are repair of aneurysm, excision and reconstruction using bypass, extracorporeal vascular reconstruction with auto transplantation, embolization and nephrectomy. Recently, a large, contemporary, multi-institutional study has demonstrated that asymptomatic RAAs rarely rupture (even when >2 cm), the growth rate is 0.086 cm/y and calcification does not protect against enlargement. (9) In the study, RAA repair was undertaken only for patients with symptomatic aneurysms or those with larger size (>2 cm) whereas majority of the asymptomatic patients were on conservative treatment and were monitored for a mean of 49 months, with no acute complications. Our patient had no preceding history of hypertension, flank pain or hematuria. Throughout her present pregnancy the aneurysm remained asymptomatic. She presented to us with history of fainting attacks and back ache for one day, which was probably the time when the aneurysm has started to expand and rupture. The reason why she did not collapse and immediately went into hypovolemic shock was that further bleeding was restricted by the tamponade effect of the retro peritoneum. Since she has had a previous cesarean delivery and presented to us in state of early shock with absent cardiac activity the most common differential diagnosis were rupture uterus or placental abruption Retroperitoneal hematoma disturbs anatomy markedly, this was the reason that the surgeon could not feel the RAA, and since the hematoma was not enlarging it was thought best to leave it undisturbed by putting a drain .Since the patien t presented during emergency hours at night, CT angiography could not be done after the first laparotomy. Subsequently, CT angiography was done the next morning when the facility was available. However, if feasible, evaluation of a retro-peritoneal hematoma is best done by CT angiography, which should have been done after the first laparotomy in our case.

Conclusion

Rupture of renal artery aneurysm is a life threatening condition with a nonspecific presentation which requires extreme vigilance on the part of treating surgeon to forestall a tragic loss of both mother and fetus. Despite being reported time and again its diagnosis remains elusive and is never thought of as a cause of hemorrhagic shock during pregnancy. Our aim was to remind our readers of this rare catastrophe.

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