



COARCTATION OF THE AORTA – AN UNUSUAL CAUSE OF HYPERTENSION IN PREGNANCY

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ABSTRACT

Coarctation of aorta is rare disorder accounting for approximately 2% of congenital heart disease. A 25-year-old primigravida presented with 36 weeks pregnancy with impending signs of eclampsia and differential blood pressure in two arms. The labour was induced, because of uncontrolled hypertension and patient underwent easy vaginal delivery. Post delivery, she was thoroughly investigated and was diagnosed to have Coarctation of aorta and underwent successful elective surgical repair of coarctation of aorta.

Key Words- Coarctation of Aorta, Eclampsia, Hypertension

INTRODUCTION

Coarctation of aorta is rare disorder accounting for approximately 2% of congenital heart disease. Although 80% of the cases are diagnosed in childhood, occasionally the disorder may first present in adulthood. Coarctation of the aorta is an unusual cause of hypertension in pregnancy because the disorder in adults is often unrecognized by obstetricians. In this paper we report one case where the diagnosis of Coarctation was missed and compare current clinical experience with that obtained earlier in the century.

CASE REPORT

A 25-year-old primigravida presented to us with 36 weeks pregnancy with impending signs of eclampsia. Clinical examinations demonstrate that the blood pressure was different in the two arms. It was 230/100 in right arm and 110/70 in left arm. Urine albumin was 3+ by dipstick method. Chest examination revealed a loud systolic murmur in aortic area radiating along carotid artery also to the interscapular area.

Bilateral femoral and popliteal pulses were weak. The labour was induced, because of uncontrolled hypertension and patient underwent easy vaginal delivery within 10 hours of induction. Post delivery, she was thoroughly investigated. Her platelet count, RFT, LFT were within normal limits. Ultrasound revealed normal kidneys and adrenals. Her ESR was 85 mm/1st hr. Bilateral optic fundi revealed optic disc edema. ECG was suggestive of left ventricular hypertrophy and chest x-ray film demonstrated rib notching. CT angiography was done and was diagnosed to have Coarctation of aorta.

She underwent elective surgical repair of coarctation of aorta. After the procedure her leg pulses were easily palpable. She is on continuous follow up on outpatient basis. On last visit her blood pressure was 130/80 without any antihypertensive treatment.

DISCUSSION

The term Coarctation of the aorta implies a constriction of the vessel in the region of the insertion of the ductus arteriosus or its vestige.¹ In 1760 Morgagni called attention to this condition.

Several theories have been advanced relative to the pathogenesis of this condition. At present the most widely accepted theory is that on intrauterine anomalous development at the site of fourth aortic arch. Coarctation of the aorta occurs in varying degrees from an abrupt ligature – like constriction, to localized hypoplasia. The entire aorta is hypoplastic in 10% of cases.¹

In 1940 Mendelson reviewed the world literature and concluded that the risk attendant to pregnancy in patients with Coarctation of aorta were great enough to warrant prevention or cessation of the pregnancy and avoidance of vaginal delivery. He suggested that increased intra-abdominal pressure during labour and vaginal delivery may precipitate aortic rupture.¹

Later Dixon and Hartley studied several patients with Coarctation of the aorta during pregnancy, labour and delivery and concluded that blood pressure (Cuff measurements in brachial artery) did not rise above non-pregnant levels and that blood pressure fell in the second trimester and then rose almost to pre-pregnancy levels at term and throughout labour.² Goodwin stated that hazards in the life of a patient with Coarctation of aorta were not increased by pregnancy and that the blood pressure tended to be normal or similar to that in essential hypertension. His recommendations for a patient with uncomplicated Coarctation of the aorta includes allowing normal pregnancy to go to term, with a shortened second stage of labour and forceps delivery.³

Surgical repair of Coarctation of aorta became available in 1944.^{4,5} This provided marked improvement or resolution of the hemodynamic obstruction. Balloon angioplasty was first described by Singer et al in 1982.⁶ This drastically improved the obstetrical and maternal outcome. We are here giving the results of the various studies carried out to evaluate the outcome of pregnancy in patients with Coarctation of aorta.

Patients with Coarctation of aorta develop headache, fatigue, nose bleeding, tinnitus, dizziness, intermittent claudication and occasionally heart failure; endocarditis, aortic dissection, aneurysm formation or cerebral hemorrhage. Bicuspid aortic valve, medial necrosis may be associated with Coarctation of aorta.

In conclusion, Coarctation of aorta is not as deadly previously it was thought to be. Surgical repair and balloon angioplasty significantly improved the maternal neonatal outcome. However, there can be late complications after Coarctation repair like residual hypertension, re-Coarctation, aneurysm at the site of repair, premature coronary artery disease, ventricular dysfunction or complications related to bicuspid aortic valve disease.

Preconception risk stratification is important in these patients. The severity of the Coarctation gradient, the size of aorta, the presence of an aneurysm at the repair site, the presence of hypertension and the severity of bicuspid aortic valve disease, if present are important issues to consider when determining an individual's risk. Ideally, comprehensive cardiovascular examination should be undertaken before embarking on pregnancy. Repair of Coarctation should occur prior to pregnancy. Pregnancy should be postponed in whom blood pressure is not well controlled. Women treated with angiotensin converting enzyme inhibitors or angiotensin receptor blockers had to have these medications stopped prior to pregnancy. Beta blockers are usually used. Poorly controlled hypertension leads to adverse neonatal (growth retardation, abruption placenta, and premature delivery) and maternal (renal failure, hypertensive crisis, rupture of intracranial aneurysms) outcomes. However, antihypertensive medications can exacerbate hypotension distal to the Coarctation site and result in diminished placental perfusion. Transmission of congenital heart disease to offspring should be discussed to patient, generally, vaginal deliveries are recommended in uncomplicated cases.

Table 1:

	Mendelson's et al (1940) ¹	Shanahan and Romney et al ⁷ (1958)	Deal et al ⁸ (1973)	Saidi et al ⁹ (1998)	Beauchense et al ¹⁰ (2001)	Vriend et al ¹¹ (2005)
No. of patients, pregnancies and live birth	29	10, 24, 24	28, 83, 64	18, 36 29	50, 118 106	54, 126, 98
Cardiovascular complications (endocarditis, CHF etc.)	4 maternal deaths due to cardiac causes (cardiac failure, rupture of aorta, endocarditis)	Nil	Nil	Nil	1 patient died at 36 weeks of pregnancy due to Stanford type A aortic dissection	Nil
Intracranial hemorrhage	1 maternal death from cerebral accident	Nil	Nil	Nil	Nil	Nil
Abortion / Miscarriage		Nil	10%	19%	11%	28%
Preterm deliveries		Not recorded in study	Not recorded in study	17%	3%	7%
Preeclampsia		Nil	Not recorded	11%	2%	4%
Caesarean section		28%	1.5%	11%	36%	6%
Congenital cardiac defect in infant (% of live birth)		Not recorded in study	Not recorded in study	3.4%	4%	4%
Reoperation for coarctation (% of patient)		Not recorded in study	Not recorded in study	22.2%	20%	33%
Isolated hypertension in pregnancy		Not recorded in study	Not recorded in study	Nil	30%	22%

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