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Case report

ISOLATED MAJOR AORTOPULMONARY COLLATERAL ARTERY CAUSING CCF IN A NEWBORN: A CASE REPORT

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ABSTRACT

Major Aortopulmonary collateral artery (MAPCA) is an anamolous vascular connection in between aorta or one of its main branches and pulmonary artery. It is single or multiple in which case it's called multiple anamolousaortopulmonary collaterals (MAPCAs). These are usually seen in association with congenital heart diseases with decreased pulmonary blood flow but rarely may it be present as an isolated anamoly without evidence of any structural heart disease. The infant may present with pulmonary hypertension, bronchopulmonary dysplasia, recurrent lower respiratory tract infections or Congestive cardiac failure (CCF). We describe here a case of isolated Aortopulmonary collateral artery causing congestive cardiac failure in a late preterm baby. The congestive cardiac failure in this infant was successfully managed by obliteration of MAPCA by a single coil.

Key words: Major Aortopulmonary Collateral Artery, Congestive cardiac failure, Micro coil Embolization**.**

INTRODUCTION

Major Aortopulmonary collateral arteries (MAPCAs) are anomalous arteries that develop from aorta or its main branches and are connected with pulmonary arteries. Usually these MAPCAs are seen in association with cyanotic congenital heart diseases.[1] Aortopulmonary collaterals sometimes cause pulmonary hypertension specially in association with cyanotic congenital heart diseases with pulmonary oligemia like Pulmonary atresia or tetralogy of fallot where these Aortopulmonary collateral arteries are an important form of alternative blood supply to lungs.[2] In neonates especially in preterm infants these collaterals are asymptomatic and usually doesn't need any intervention.[3].Rarely Major Aortopulmonary collateral artery may be present without any evidence of congenital heart disease. In some cases this can be large enough to cause symptoms and may need intervention. MAPCAs can also cause bronchopulmonary dysplasia.[4] Aortopulmonary arteries, isolated or multiple should always be kept in mind as a differential diagnosis in infants presenting with congestive cardiac failure, bronchopulmonary dysplasia or recurrent respiratory tract infections.[5] Infants who have clinical features suggestive of Aortopulmonary collateral should therefore be subjected to detailed echocardiographic examination including color Doppler studies and if facilities are available then cardiac CT can also be done .[6] When in doubt diagnostic catheterization should be done. We present here case of a neonate presenting with CCF secondary to MAPCA who was successfully managed by obliteration of MAPCA by a single coil.

CASE REPORT

A late preterm, small for gestational age Male child was delivered by LSCS in view of meconium stained amniotic fluid. Baby didn't cry immediately after birth. Endotracheal intubation was done meconium was recovered from under the cord and intermittent

positive pressure ventilation was given for 2 minutes after which baby developed spontaneous respiration. Baby was admitted in NICU in view of respiratory distress. On examination he had mild tachypnea and grunting along with subcostal and intercostal retractions. On auscultation there was a continuous murmur over left infrascapular area. Continuous positive airway pressure was given for respiratory distress and he was kept NBM and IV fluids and antibiotics were started. Respiratory distress started settling down on D3 of life and hence baby was shifted from CPAP to oxygen by head box. Subsequently baby started having tachycardia and enlarged liver span. In view of presence of a murmur along with the signs suggestive of CCF an urgent 2D Echo was done. On 2 D echo there was no evidence of congenital heart disease. Pulmonary stenosis or atresia was also ruled out. Color Doppler studies showed a possible connection between descending aorta and pulmonary artery. In view of CCF anti failure measures (Digoxin and Furosemide) were started. Despite these medications baby had tachycardia and tachypnea along with gradual increase in liver span. A provisional diagnosis of Major aortopulmonarycollateral artery causing CCF was made and catheterization study was planned.

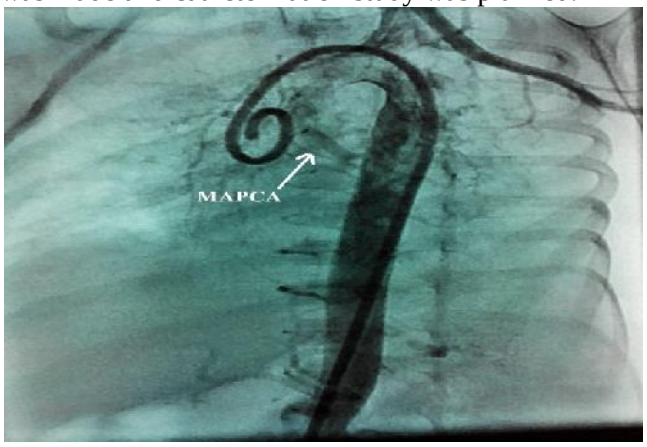

Fig 1: A Major Aortopulmonary collateral artery is seen connecting descending aorta and pulmonary artery

On cardiac catheterization a major aortopulmonary collateral artery of 1.7mm diameter connecting descending aorta and pulmonary artery was seen. This MAPCA was completely embolized using embolization micro coil of 4mm size. Catheterization study post embolization showed complete obliteration of collateral circulation.

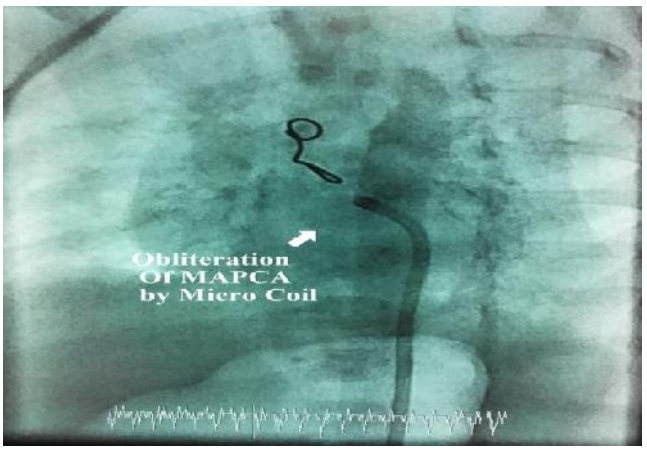

Fig 2: Circulation through MAPCA is completely obliterated. Embolization microcoil is visible

Post Embolization baby was stable. Gradually the tachycardia settled down and also there was improvement in CCF. Anti-failure measures were gradually tapered and baby was started on Nasogastric tube feeding. Feeding was gradually increased up to full feeds. A review 2 D Echo was done which showed blood flow in proximal part of aortopulmonary artery but there was no flow in distal collateral. Baby was gradually shifted to direct breast feeding and later was discharged.

DISCUSSION

Congestive cardiac failure in a neonate and during early infancy can be due to many etiologies. While many times this is due to congenital heart diseases other possibilities should also be kept in mind. MAPCAs are occasionally described as a cause of congestive cardiac failure in neonates and in infancy where they may necessitate surgical intervention in initial few weeks of life. [7] Other presenting features of MAPCAs are persistent pulmonary hypertension of newborn and failure to thrive. Though MAPCAs are usually seen in association with congenital heart diseases with decreased blood flow like pulmonary atresia and stenosis or tetralogy of fallot.[8] occasionally they can be seen in isolation with no evidence of any other congenital heart defect. MAPCAs without congenital heart disease may be seen in premature babies but in this setting usually conservative management is all that is required. In one study MAPCAs were seen in 66% premature babies out of which 11% had signs suggestive of congestive cardiac failure and only one was diagnosed with major collateral artery requiring

Embolization.[9] Haemodynamically these MAPCAs may cause CCF because of left to right shunting of blood across collateral artery.[10]

In our case the child was a late preterm with birth weight of 2.1 kg. The baby was born through meconium stained amniotic fluid and basically was admitted in NICU in view of respiratory distress but later developed signs of congestive cardiac failure in 2nd week of life. The interesting thing about this case was presence of major aortopulmonary collateral in absence of any structural abnormality of heart. In our case the etiology of major isolated aortopulmonary collateral remains a matter of investigation. Because the aortopulmonary collateral was symptomatic it needed intervention. Microcoil embolization was successful and post procedure patient improved and subsequently was discharged.

CONCLUSION

Even though the major cause of CCF in neonates and during early infancy is congenital heart diseases a possibility of aortopulmonary collateral should be kept in mind as a differential diagnosis. Though these MAPCAs are usually present in combination with cyanotic congenital heart diseases like Pulmonary atresia, pulmonary stenosis or tetralogy of fallot, absence of this doesn't rule out the possibility of MAPCA.

Conflict of interest: Nil

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