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Prenatal Diagnosis of Fetal Coarctation (About a Case and Reviews of the Literature)

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Abstract:- Coarctation of the aorta is characterized by narrowing of the distal aortic arch which can lead to reduced blood flow in the fetal aortic arch, leading to arch hypoplasia, usually clinically evident after birth.

Coarctation of the aorta is a common congenital heart defect accounting for about 8% of heart defects. Prenatal diagnosis of fetal coarctation is always difficult. It is mainly suspected by ventricular disproportion (left ventricle smaller than right ventricle). We present the case of a patient referred to our service for the management of a suspected fetal heart disease during pregnancy estimated at 23 weeks of amenorrhea.

Keywords:- *Prenatal Diagnosis; Coarctation.*

I. INTRODUCTION

Coarctation of the aorta is characterized by narrowing of the distal aortic arch which can lead to reduced blood flow in the fetal aortic arch, leading to arch hypoplasia, usually clinically evident after birth.

Coarctation of the aorta is a common congenital heart defect accounting for about 8% of heart defects.

Prenatal diagnosis of fetal coarctation remains difficult. It is mainly suspected in front of a ventricular disproportion (left ventricle smaller than right ventricle). However, the sensitivity of this discordance is moderate for the diagnosis of coarctation, which leads to a high rate of false positives.

We present the case of a patient referred to our department for the management of a suspected fetal heart defect in pregnancy estimated at 23 weeks of amenorrhea.

II. CASE REPORT

This is a 30 year old patient with no notion of consanguinity, consanguinity, multiparous, referred for the management of a suspected cardiac malformation with a 23 week amenorhea pregnancy.

The obstetrical ultrasound showed :

A ventricular disproportion, with a disproportionately smaller left ventricle than right ventricle(figure 1). Asymmetry in the diameter of the large vessels in a fetus at 23 SA(figure 2). Narrowing involves the entire aortic arch with a transverse aorta that appears tubular(figure 3)

The presence of an upper left cava vein(figure 4) in front of all these echographic signs, the diagnosis of coarctation of the aorta was suspected.

The patient was under armed surveillance until delivery at 39 SA in the presence of a cardiopediatrician who had been notified beforehand gave birth to a newborn male APGAR 10/10 with a birth weight of 3K200

The echocardiography performed by the cardiopediatrician in the postnatal period makes the diagnosis of coarctation of the aorta suspect but remains to be confirmed after closure of the arterial canal.

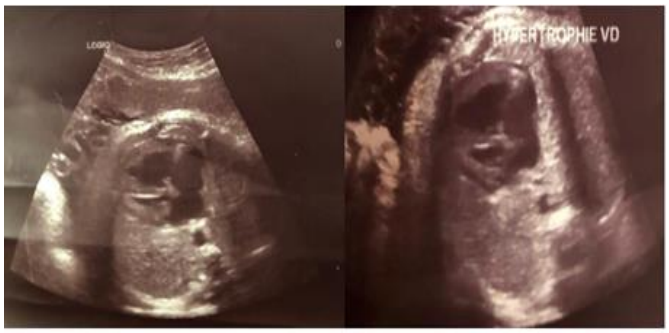

Figure 1 :show a ventricular disproportion, with a disproportionately smaller left ventricle than right ventricle

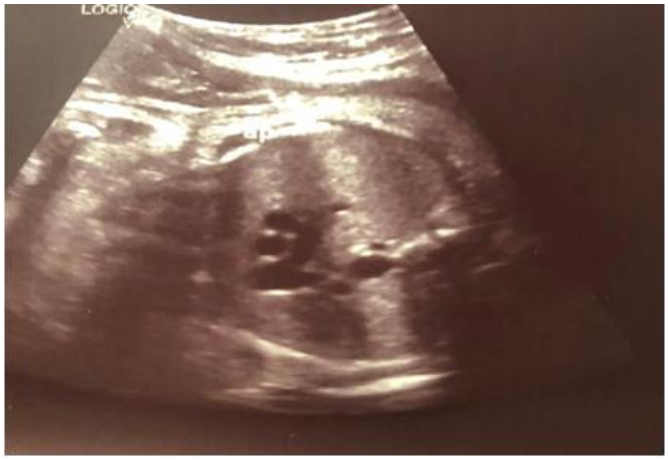

Figure 2 : show Asymmetry in the diameter of the large vessels in a fetus at 23 SA

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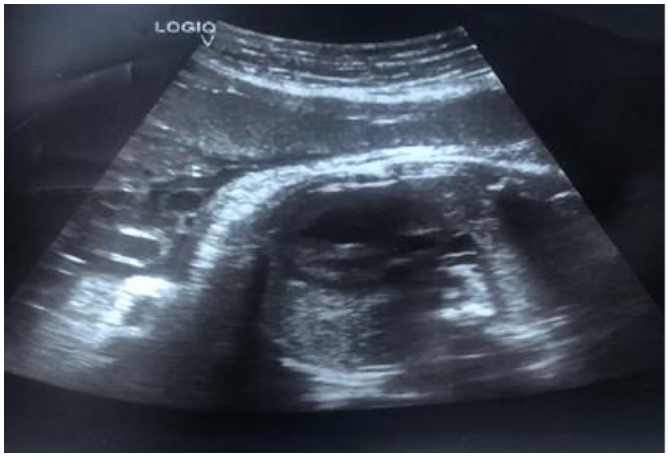

Figure 3:showNarrowing involves the entire aortic arch with a transverse aorta that appears tubular.

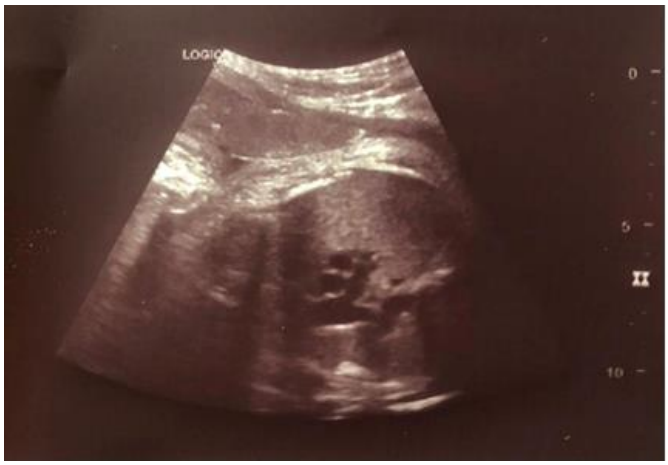

Figure 4:show The presence of an upper left cava vein

III. DISCUSSION

Coarctation of the aorta is characterized by narrowing of the distal aortic arch. This obstructive lesion may reduce the blood flow in the fetal aortic arch, leading to arch hypoplasia, although in some cases this may only be clinically evident after birth, or even in later life.

CoA is a relatively common since it is associated in approximately 7% live births with birth defectscongenital heart disease [1] [2].

Antenatal diagnosis of coarctation of the aorta is difficult but primordial because it reduces the mortality due to this malformation by early treatment of the neonate.

Screening and diagnosis of this malformation meet the foundations of medicine fetal, i.e. adapting the care pathway for carrier fetuses of this malformation in order to optimize their management perinatal.

CoA can be a cadiopediatric emergency neonatal.As has been shown for transpositions of the great vessels, prenatal screening of fetuses at high risk of developing CoA improves their become with a significant reduction in their morbidity and their mortality [3].

Echocardiography allows identification of groups at high risk but does not predict with certainty the constitution of a coarctation after birth Like many other heart defects or extracardiac, the presence of a personal history, or familial to the first degree or to varying degrees of CoA or any other pathology of the left tract including non-stenosing bicuspidia significantly increases the risk of recurrence for the offspring. Recurrence can be variable penetrance. This is how a CoA present in a parents can reoffend in the form of a CoA, a bicuspidia, or hypoplasia of the left ventricle.

suspicion is usually raised when there is a ventricular disproportion, with a disproportionately smaller left ventricle than right ventricle. but a discrepant ventricular size has only a moderate sensitivity and a low specificity and low positive predictive value for the diagnosis.

The presence of ventricular asymmetry is particularly sensitive in the second trimester of pregnancy. David et al. indeed report a sensitivity of 72% in screening for CoA when the imbalance ventricular is observed before 25 weeks of amenorrhea [4]

In the French series of the Paris childcare institute (PPI), the authors find that only 10% of fetuses that had ventricular asymmetry discovered in third trimester of pregnancy subsequently developed CoA [5].

The sensitivity of the discovery of asymmetry of the cavities ventricular cells in screening fetuses at risk for CoA is improved by the presence of an asymmetry of interest also the great vessels. The diameter of the ring the pulmonary artery in diastole is then greater than that of the aortic annulus [6,7].

So, unlike ventricular asymmetry which can be faulted in the event of large CIV, a CoA is almost always associated with a marked asymmetry of the great vessels. The ratios used to characterize the asymmetries of the great vesselswill be identical to those used for asymmetry of the ventricles.

At this finding of a ventricular asymmetry and / or large vessels should be looked for for the presence of associatedsigns that may increase the sensitivity of the screening. In indeed, the presence of a left superior vena cava draining into the coronary sinus is frequently associated with CoA.

The finding of aortic bicuspid also increases the predictive value of postnatal CoA occurrence. A bicuspid was found in 87.5% of children with CoA from the Paris Institute of Child Care series [8]

Sharland et al. have also reported in some fetuses, who developed during the postnatal period a CoA, the presence of a reversal of blood flow in the foramen oval, that is to say from left to right, individualized in color Doppler mode [9].As reported in many other congenital heart disease, the contribution of ultrasound 3D is a diagnostic aid in case of suspicion of CoA. This was reported by different authors in the context biometric and morphological analysis of the aortic isthmus [10–11].

The presence of significant ventriculo-arterial asymmetry from the second trimester of pregnancy cause fear of constitution of a CoA after birth. They must therefore benefit from specific care with childbirth in maternity level III and monitoring of the newborn in an cardiopediatric. It's not so important whether he's going to have or not the formation of a coarctation than to spotsigns of poor tolerance to ductus arteriosus. It is then possible to reverse by infusing prostaglandins, the pro-inflammatory effect of which allows reopening of the ductus arteriosus and lifting of the coarctation.This development leads to a repair of the coarctation from the first days of life.

If on the contrary, the coarctation occurs but remains well tolerated without signs heart failure, then we can wait a few months before its surgical correction. In 20% of cases approximately, there is ultimately no coarctation of the aorta and we conclude with a normal heart.

IV. CONCLUSION

The predictive factors of coarctation were early diagnosis in the second trimester of pregnancy, a ratio of pulmonary artery diameter to aortic diameter greater than 1.6, the presence of a left superior vena cava and bicuspid aortic valve, the diagnosis of which is more often postnatal but which enables prediction of coarctation with nearly 90 % accuracy when ventricular asymmetry has been identified at an early stage.

Indeed, the good knowledge of the tools put to ourcurrently available, as well as their main limitations,will allow the doctor to reduce the rates of false negatives and false positives associated with characterization prenatal of this situation in order to organize efficient perinatal care of thesechildren.

REFERENCES

[1]. Allan LD, Sharland GK, Milburn A, Lockhart SM, Groves AM, Anderson RH, et al. Prospective diagnosis of 1,006 consecutive cases of congenital heart disease in the fetus. J Am Coll Cardiol 1994;23(6):1452–8.
[2]. Rosenthal E. Coarctation of the aorta from fetus to adult: curable condition or life long disease process? Heart 2005;91(11):1495–502
[3]. Franklin O, Burch M, Manning N, Sleeman K, Gould S, Archer N. Prenatal diagnosis of coarctation of the aorta improves survival and reduces morbidity. Heart 2002;87(1):67–9.
[4]. David N, Iselin M, Blaysat G, Durand I, Petit A. Déséquilibre dans le diamètre des cavitéscardiaques et des vaisseaux chez le fœtus. Arch Mal Coeur Vaiss 1997;90(5):673–8
[5]. Stos B, Le Bidois J, Fermont L, Bonnet D. Le diagnostic anténatal de la coarctation de l'aorteest-il possible ? Arch Mal Coeur Vaiss 2007;100(5):428–32
[6]. Sharland GK, Chan KY, Allan LD. Coarctation of the aorta: difficulties in prenatal diagnosis. Br Heart J 1994;71(1):70–5.
[7]. Slodki M, Rychik J, Moszura T, Janiak K, Respondek-Liberska M. Measurement of the great vessels in the mediastinum could help distinguish true from false-positive coarctation of the aorta in the third trimester. J Ultrasound Med 2009;28(10):1313–7.
[8]. Stos B, Le Bidois J, Fermont L, Bonnet D. Le diagnostic anténatal de la coarctation de l'aorteest-il possible ? Arch Mal Coeur Vaiss 2007;100(5):428–32.
[9]. Sharland GK, Chan KY, Allan LD. Coarctation of the aorta: difficulties in prenatal diagnosis. Br Heart J 1994;71(1):70–5
[10]. Quarello E, Trabbia A. High-definition flow combined with spatiotemporal image correlation inthe diagnosis of fetal coarctation of the aorta. Ultrasound ObstetGynecol 2009;33(3):365–7.
[11]. Rizzo G, Arduini D, Capponi A. Use of 4-dimensional sonography in the measurement of fetal great vessels in mediastinum to distinguish truefrom false-positive coarctation of the aorta. J Ultrasound Med 2010;29(2):325–6.