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SINGLE UMBILICAL ARTERY IN A NEWBORN,SIGNIFICANCE AND REVIEW OF LITERATURE

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ABSTRACT

Single umbilical artery (SUA) is a situation when the umbilical cord contains only one umbilical artery instead of the normally occurring two umbilical arteries. There are two conditions in the fetuses or the newborns with a SUA ,ie when they have just a SUA or an isolated SUA (when the SUA is present in the absence of chromosomal and structural abnormalities).Literature review has highlighted that the presence of a SUA is associated with an increased risk of perinatal morbidity and mortality. Neverthless during the most important periods of pregnancy, labor, and delivery there is an high rate of complications especially in the isolated SUA variety. This article reports a case of SUA in a three day old male baby and its significance.

INTRODUCTION

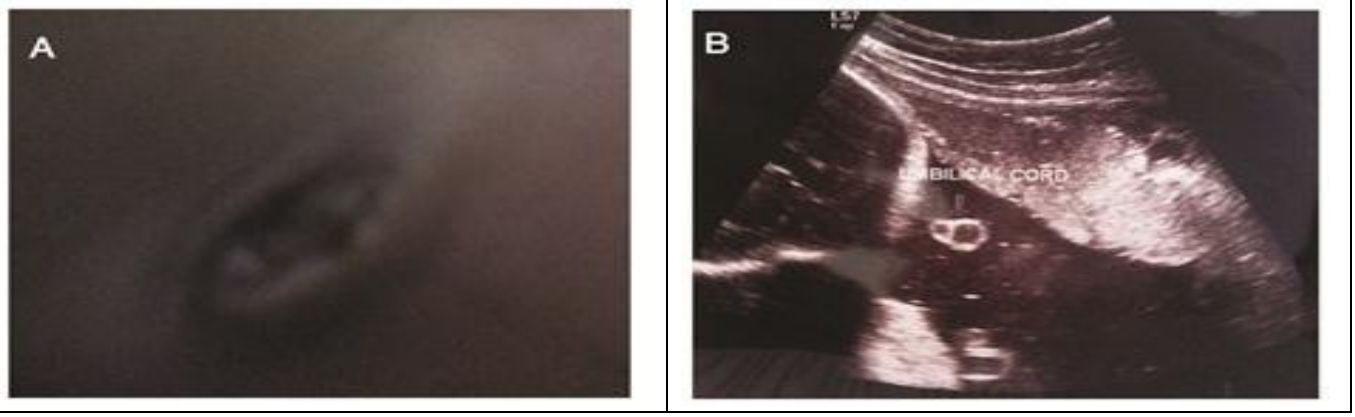
Single umbilical artery (SUA) is a condition when the umbilical cord which normally has one umbilical vein and two umbilical arteries has only one umbilical artery (UA). The prevalence of SUA in the population is in the limits of 0.2% to 11% [1]. SUA is diagnosed in the prenatal ultrasonogram and also confirmed clinically after delivery of the newborn. The SUA is an important finding in many of the congenital and chromosomal anomalies .When the fetus or the newborn has a SUA in the absence of any chromosomal and structural abnormalities it is known as the isolated SUA [2]. The identification of SUA helps in the prenatal diagnosis of aneuploidy and congenital anomalies. Many data have been highlighting the aspect of outcomes for the newborns such as increased rates of prematurity, growth retardation, cardiac and renal anomalies in the presence of SUA and isolated SUA [3,4]. This case reports a case of SUA in a three day old male baby.

CASE REPORT

A 3 day old male baby was seen during the postnatal rounds in the ward. The birth history revealed that he was born to a 29 year old mother at 37 weeks gestation via spontaneous vaginal delivery weighing 3.6 kg with normal apgar score. His parents were of non-consanguineously married. The antenatal ultrasonogram done revealed that he had SUA. His parents were informed about the SUA. The baby has received only breastmilk. On general physical examination, baby had stable vitals. He was afebrile, heart rate 102/minute, respiratory rate 36/minute, anterior fontanelle was normal. His oxygen saturation was 100% at room air. All peripheral pulses were equally felt. Blood pressure was 94/56 mm Hg in right upper limb, 94/55 mm Hg in left upper limb. 92/56 mm Hg in right lower limb. 93/56 mm Hg in left lower limb. His respiratory effort remained good and was active and at times crying vigourously. Abdominal examination did not reveal any mass in the abdomen and there was no

hepatosplenomegaly. Cardiovascular system examination was normal. Genito urinary system examination was normal. He did not have any neurological deficits. Breast feeding was initiated soon after delivery and baby was breastfeeding well. An ultrasound examination of the abdomen and 2DEchocardiogram were done and was normal. The newborn was discharged with advice for continuing exclusive breast feeding and to follow-up. The baby had come for review in the last three months and immunized according to the National immunization schedule, breast feeding continued and is doing well.

Figure 1. A) Photo of the Umbilicus with the single umbilical artery B) Photo of the ultrasound of the umbilical cord showing the single umbilical artery



DISCUSSION

The fetus and the newborn have an umbilical cord which normally has two umbilical arteries and one umbilical vein [5]. There are variations in this anatomy which is seen in various meta-analysis by prenatal sonographic evaluation, after examination of the umbilical cord after delivery or by analysis of the autopsy findings of the newborns who expired after an underlying chromosomal or congenital anomalies [1,2,4]. The ever changing advancement in the field of ultrasonography has helped clinicians and radiologists interested in fetal ultrasonography to detect the congenital anomalies and there lies the significance of SUA as it is associated with many prenatal and perinatal morbidity and mortality in the fetus and the newborn.So it helps in the diagnosis of these problems very early and appropriate measures can be taken depending upon the viability of the fetus ,to continue the pregnancy and also in the undue care of the newborn[6]. The case in the study was detected to have a SUA in the antenatal scan at fifth month of gestation and was under regular follow up. Many maternal and fetal risk factors are mentioned to be associated with SUA. SUA is seen in fetuses born to mothers with maternal diabetes mellitus, epilepsy, toxaemia of pregnancy , antepartum hemorrhage, polyhydramnios and oligohydramnios. Increase in the age of the mother , multiple births ,substance abuse by the mother especially smoking, maternal use of antiepileptics such as phenytoin are associated with occurrence of SUA [4,7]. The presence of placenta previa, placental abruption, are also found in the history of babies with SUA.[8] .Fortunately the mother did not have any risk factors in the case presented and the baby did not have any anomalies other than the SUA.

It is an important topic of neonatology and fetal radiology whether to investigate babies born with SUA and isolated SUA. There is a marked increase of chromosomal abnormalities and congenital malformations in fetuses with SUA especially in the isolated SUA [2,8,9]. The central nervous system complications include detection of holoprosencephaly, hydrocephalus, enlarged cisterna magna and mild cerebral ventricular dilatation.The gastrointestinal and respiratory system complications include prescence of omphalocele, hydrothorax, and diaphragmatic hernia. Many of the fetuses with SUA had cardiac defects and some had skeletal dysplasia especially with the isolated SUA. The prevalence of renal anomalies in neonates with isolated SUA is low. The major renal anomaly was vesico-ureteric reflux which was most frequent with grade 2 or greater, in 2.9% of the total population studied [10]. The other renal anomalies seen were the presence of a pelvic kidney, and unilateral absent kidney [6-10]. SUA is an associated clinical entity known as the VATER/VACTERL association [11]. The presence of at least three of the following congenital anomalies such as vertebral anomalies (V), anal atresia (A), cardiac malformations(C), tracheo-esophageal fistula (T), renal anomalies(R), and limb abnormalities (L) clinges its diagnosis. Sandal et al reported a case of SUA in one of the twins and twin born babies are having higher incidence of SUA [6-11]. So various studies recommend investigating newborns with SUA or an isolated SUA with fetal echocardiography, ultrasonogram of the abdomen and pelvis. Micturating cystourethrogram or intravenous pyelography may be considered depending on the renal anomalies detected [6-11]. An ultrasound examination of the abdomen and 2DEchocardiogram were done in the

baby presented and were normal and he had an SUA but not an isolated SUA. It is established from various studies regarding the fact of higher incidence of intrauterine or intrapartum fetal deaths-stillbirths, intrauterine growth restriction and prematurity leading to tncrease in the neonatal mortality of these babies with SUA [2-4,7,9]. The prognosis for fetuses and newborns with SUA is directly proportional to the associated chromosomal and fetal structural abnormalities in them[2,8,10].The prognosis for the baby in the case presented is excellent as he is not having any of the anomalies as is mentioned in many studies in babies without an isolated SUA [2,7-9]. This case study concludes that awareness of SUA, especially the isolated SUA among the Paediatricians, Obstreticians and treating Physicians is very important. Once the fetal ultrasonogram in the hands of the experts detects SUA, the pregnancy of the expecting mother should be closely monitored for fetal growth and presence of various associated anomalies.

Every newborn must be properly examined and especially the umbilical cord to look for the presence of an SUA. This will also help in the counseling of the parents about the outcome of the pregnancy and improving maternal and newborn care.

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