

## Case Report:

### Persistent truncus arteriosus with a single umbilical artery: A case report

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#### Abstract

The persistent truncus arteriosus (TA) is an uncommon cardiac anomaly with an incidence of 0.7% of congenital heart disease. It is characterized by a single arterial trunk arising from the normally formed ventricles. Although only 0.7 percent of all congenital heart lesions are due to TA, it accounts for 4 percent of all critical congenital heart disease cases. Single umbilical artery is associated with major anomalies including cardiovascular malformations. Incidence of single umbilical artery is associated with various congenital anomalies including genitourinary (6.48%) and cardiovascular (6.25%) and musculoskeletal (5.44%). An eighteen weeks old male fetus of 30 year old G3P1L1MTP1 diabetic mother was obtained after hysterotomy from the department of obstetrics. Only a single blood vessel was seen to arise from the left ventricle which gave rise to two pulmonary arteries from its postero-lateral aspect (Collett and Edwards type II). The arch of the aorta was present on left side. No significant abnormalities were noted in other organs. A section of umbilical cord showed the single umbilical artery on H&E staining. It is known that the single umbilical artery is commonly associated with cardiac abnormalities but a very limited literature is available on its etiology.

**Keywords :** Persistent truncus arteriosus, single umbilical artery

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#### INTRODUCTION

The persistent truncus arteriosus (TA) is an uncommon cardiac anomaly with an incidence of approximately 0.7% of congenital heart disease [1]. It is characterized by a single arterial trunk arising from the normally formed ventricles. It is one among the conotruncal anomalies resulting from the failure of fusion of conotruncal ridges. It is usually but not always associated with a defect in the membranous interventricular septum.

In truncus arteriosus, pulmonary artery origin follows a described pattern, most commonly from the proximal ascending aorta [2].

The incidence of single umbilical artery is about 1% in all births. Single umbilical artery is associated with major anomalies including cardiovascular

malformations [3]. Here we report a case of truncus arteriosus and single umbilical artery in an aborted fetus of 18 weeks gestational age (GA).

#### CASE REPORT

An eighteen weeks old male fetus of 30 year old G3P1L1MTP1 diabetic mother was obtained after hysterotomy from the department of obstetrics. Detailed fetal dissection was conducted in the department of Anatomy KMC Manipal.

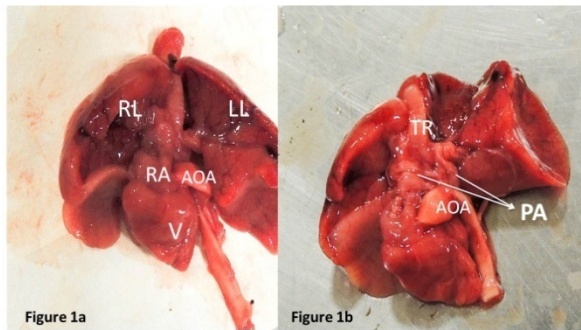
The following observations were noted.

- Only a single blood vessel was seen to arise from the left ventricle which gave rise to two pulmonary arteries from its posterolateral aspect (Collett and Edwards type II) [4]. The arch of the aorta was present on left side.

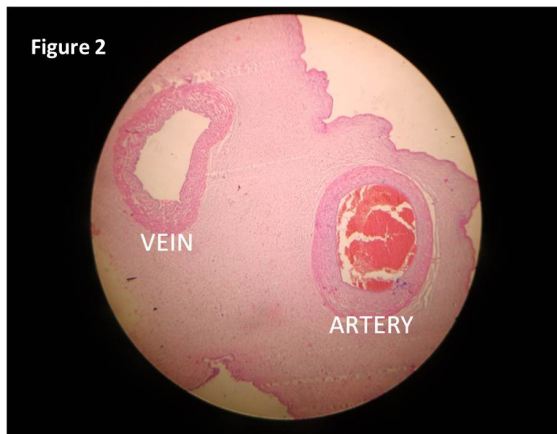
(**Figure 1a and 1b**) ) No significant abnormalities were noted in other organs.

- A section of umbilical cord was taken for further sectioning and H&E staining
- Single umbilical artery was observed after staining. There was no abnormality observed in umbilical vein.(**Figure 2**)

[ **Figure 1a and 1b**: Specimen of heart, lungs and great vessels ; **1a**- Anterior view, **1b**- Posterior view. RA- Right atrium, AOA- Arch of aorta, V- Ventricle, RL- Right lung, LL- Left lung, PA- Pulmonary artery, TR- Trachea ]



[ **Figure 2**: Section of umbilical cord showing single umbilical artery]



## DISCUSSION

Truncus arteriosus is defined as a single arterial vessel usually arising from both the left and the right ventricle that gives rise to the systemic, pulmonary and coronary artery circulations[5]. Most commonly, patients with common trunk anomalies have a large, nonrestrictive, subarterialventricular septal defect (VSD) situated below the truncal valve [6].

During the fifth week of embryologic development, opposing ridges of subendocardial tissue appear in the bulbus cordis and truncus arteriosus. Fusion of these ridges then occurs, forming the aortico-pulmonary septum. A single semilunar valve is found in truncus arteriosus. The arterial trunk can be connected with the right ventricle, left ventricle, or override and be symmetrically distributed over both ventricles. It has an incidence of about 0.5 to 0.9 per 10,000 live births [7]. The reported incidence of truncus arteriosus (TA) ranges from 6 to 10 per 100,000 live births. Pulmonary arteries may arise from the common trunk in one of several patterns, which are often used to classify subtypes of truncus arteriosus. Several classification schemes have been proposed, none of which is ideal.

The earliest classification, developed by Collett and Edwards[4] in 1949, includes truncus arteriosus types I-IV.

- Truncus arteriosus type I is characterized by origin of a single pulmonary trunk from the left lateral aspect of the common trunk, with branching of the left and right pulmonary arteries from the pulmonary trunk.
- Truncus arteriosus type II is characterized by separate but proximate origins of the left and right pulmonary arterial branches from the

posterolateral aspect of the common arterial trunk.

- In truncus arteriosus type III, the branch pulmonary arteries originate independently from the common arterial trunk or aortic arch, most often from the left and right lateral aspects of the trunk.
- Type IV truncus arteriosus, was proposed by Collett and Edwards as a form of the lesion with no pulmonary arteries arising from the

common trunk, is now recognized to be a form of pulmonary atresia with ventricular septal defect rather than truncus arteriosus.

The single umbilical artery is commonly associated with cardiac abnormalities but a very limited literature is available on its etiology. Incidence of single umbilical artery is associated with various congenital anomalies including genitourinary (6.48%) and cardiovascular (6.25%) and musculoskeletal (5.44%) [8].

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