**UNIVERSITY OF NAIROBI – SCHOOL OF MEDICINE**

**DEPARTMENT OF HUMAN PATHOLOGY**

**PAEDRIATRIC AUTOPSY REPORT**

**BIODATA**

Name:- Baby Nancy Wanjiku Wambui

Age:- 2½ days

Sex:- Female

Date of Death:- 29.01.2021

Time of Death:- Unknown

Place of Death:- KNH Main Theatre

Date of autopsy:- 02.02.2021

Time of autopsy:- 11:45am

Autopsy performed at:- KNH Farewell Home

Autopsy reference number:- A/0113/21

Type of autopsy:- Forensic

Pathologist in charge:- Dr. J. Ndung’u

**CLINICAL SUMMARY**

The deceased who was aged 2½ days old was taken to the operating theatre to repair a ventricular septal defect (VSD) and post-op the deceased succumbed to a cardiac arrest and died on the operating table.

**IDENTIFICATION**

Prior to autopsy, the deceased was identified by her mother Miriam Wambui and Nelius Nyambura.

**EXTERNAL EXAMINATION**

The body (85cm) is that of well-nourished, well-developed mature girl infant. Skin color is brown. The skin shows no irregularity. The head is normocephalic. The anterior fontanel is open. The posterior fontanel is open. The fontanels are flat. The face is normal, features present and symmetrical. The irides are black, and the pupils are equal. The conjunctivae appear pink, and the sclerae are clear. Ear positions are normal set. The shape of the ears is normal. Their development is mature. The external auditory canals are patent on right and left. The choanae are patent on right and left. The configuration of the mouth appears normal. The chin is well developed. The palate is normal and arched but complete. The neck is normal. The trachea is straight and in the midline. The thorax is symmetrical. The nipples are appropriately spaced. Breast development is absent. The abdomen appears flat and is palpably soft. The liver edge is not palpable. The spleen tip is not palpable. The umbilicus is well healed. The external genitalia are normal for a girl. The urinary meatus is patent. The rectum and anus are patent. The spine appears straight and complete. The extremities are symmetrical and well developed. The digits and palmar markings appear normal.

**SCARS AND IDENTIFYING MARKS**

None

**EVIDENCE OF THERAPEUTIC INTERVENTION**

The following medical paraphernalia are in place: endotracheal tube, urethral catheter in situ, sternal surgical incision 9cm, central intravenous line on right side of the neck and peripheral intravenous line on right ankle joint medially and right antecubital fossa.

**EVIDENCE OF EXTERNAL TRAUMA**

None

**INTERNAL EXAMINATION**

**THORACIC CAVITY**

The thymus was removed during the surgery.

The parietal pleural surfaces are glistening and smooth. The right and left hemithorax both contain 200ml of blood. The lungs appear to occupy a normal volume in the thoracic cavity. The mediastinum is unremarkable.

The pericardial sac’s surfaces are smooth and glistening. The heart is located in its usual anatomic position in the midline with its apex pointing to the left. Hilar and mediastinal lymph nodes are small and gray.

**CARDIOVASCULAR SYSTEM**

On examining the external surfaces of the heart (70g), the atrial appendages are in their normal positions. The great vessels are normally related. The epicardial surface is glistening and smooth. The coronary arteries course in the usual fashion over the surface of the heart. The superior and inferior venae cavae and coronary sinus connect with the right atrium in the usual fashion. The diameter of the coronary sinus is normal. The interatrial septum is intact without a patent oval foramen. The right atrioventricular connection is present, and the leaflets of the tricuspid valve are thin and delicate. The right ventricular cavity is normal in size. The wall is of greater than normal thickness, and its myocardium has a homogeneous red color. The interventricular septum is has a perimembranous ventricular septal defect. The right ventricular outflow tract is unremarkable. The pulmonary valve contains three thin and

delicate semilunar leaflets. The pulmonary artery is of normal calibre and configuration. Its intimal surface is glistening and smooth. The ductus arteriosus is closed. Four pulmonary veins connect with the left atrium in the usual manner. The chamber size is normal. The left atrioventricular connection is normal with thin and delicate mitral valve leaflets. The tendinous cords appear normal and fused. The left ventricular cavity is of normal size. The wall is of normal thickness, and its myocardium has a homogeneous red color. The left ventricular outflow tract appears normal. The aortic valve contains three thin and delicate semilunar leaflets. The ascending aorta is of normal calibre and arches over the left main bronchus before descending along the left side of the vertebral column. The major arteries come off the aorta in the usual configuration. The descending aorta gives off the usual branches, and its intimal surface is glistening, smooth, and intact.

**RESPIRATORY SYSTEM**

The larynx is unremarkable. The trachea is of normal calibre and courses in the usual fashion. The lungs (right, 115g; left, 140g) contain the usual lobes and fissures, and the visceral pleural surfaces are glistening and smooth. The parenchyma is soft and pale red. The bronchi and vessels appear patent and of normal calibre. There is bloody mucus in the right and left bronchi. There is a hematoma in the upper airway (around the area where the thymus is removed).

**PERITONEAL CAVITY**

The peritoneal surfaces are glistening and intact. There is 200ml of peritoneal fluid. There is no mesenteric or periaortic lymphadenopathy.

**LIVER AND BILIARY SYSTEM**

The liver (340g) is normally positioned in the upper right, the stomach on the left midline and symmetrical in the left upper quadrant. The shape of the liver is normal; its surface is smooth and glistening. Cut sections show normal parenchyma. On the inferior aspect, the vascular pattern is normal.

The gallbladder is present.

The biliary tree is patent into the duodenum.

**PANCREAS**

The pancreas is located normally, within the duodenal sweep. Its surface and parenchyma appear gray-white and normally lobulated.

**SPLEEN**

The splenic tissue (25g) consists of a solitary spleen of normal shape. Cut sections are unremarkable.

**GASTROINTESTINAL SYSTEM**

The tongue is papillated. The esophagus courses normally to enter the stomach. The shape of the stomach is normal. The gastric mucosa is unremarkable. The pyloric canal is patent. The duodenum courses in the usual fashion and is of normal calibre. The jejunum and ileum are of normal calibre.

The cecum and appendix are fixed in the right lower quadrant and have the usual configuration. The colon is of generous calibre, and courses normally.

The rectum is patent.

**GENITOURINARY SYSTEM**

The kidneys (right, 30g; left, 40g) are located in their usual retroperitoneal position. The surface of each kidney is normal. On hemisection there are clearly demarcated corticomedullary junctions, normal pyramids and collecting system. The ureters are patent and connected to the bladder in the usual fashion. The urinary bladder appears normal. The urethra is patent/other.

For Females: The uterus, tubes, and ovaries are in their usual relative position within the pelvis. The vagina and cervix appear normal. The uterus is normal in shape. The ovaries appear normal.

**ENDOCRINE SYSTEM**

The pituitary fills the sella. The adrenal glands are of normal size and shape. They have uniform yellow cortices separated from the medullary gray by a thin red line.

**MUSCULOSKELETAL SYSTEM**

Skeletal muscles are red-brown and firm. The cartilage and bone are firm and normal. The bone marrow appears red, moist and ample/pale.

**HEAD AND CENTRAL NERVOUS SYSTEM**

Reflection of the scalp reveals no evidence of subgaleal hemorrhage. The underlying calvarium is intact and normal in thickness. The dura is intact, and its inner surface smooth and glistening. The dural sinuses are patent. Cerebrospinal fluid is clear. The brain weighs 1105g. The leptomeninges are thin and transparent with no vascular congestion, subarachnoid hemorrhage, or exudate/other. The circle of Willis and other basal vasculature are intact and normally formed. The vessels are patent and thin-walled. The cranial nerves are intact and normally distributed. The dorsal convexities of the brain are symmetrical with a well-developed gyral pattern. The brainstem and cerebellum show the usual external configuration. There is no localized external softening or contusion of the brain. There is no displacement of the cingulate gyrus, medial temporal lobe, or cerebellar tonsils/other.

**OTHER INVESTIGATIONS**

None

**SUMMARY**

The deceased, a 2½ day old female baby, was taken to the operating theatre to repair a VSD and post-op the deceased succumbed to a cardiac arrest. The patient died of cardiac arrest.

**CAUSE OF DEATH *(Reference WHO ICD 11)***

1. Immediate cause of death
2. Excessive bleeding (WHO ICD code KB41) due to
3. Surgical intervention (WHO ICD code QB8Y)
4. Ventricular Septal Defect (WHO ICD code LA88.41)
5. Contributory cause of death
6. Cardiac arrhythmias (WHO ICD code KB41) due to
7. Cardiac arrest (WHO ICD code MC82) due to
8. Surgical intervention (WHO ICD code QB8Y) due to
9. Ventricular Septal Defect (WHO ICD code LA88.41)

**MANNER OF DEATH**

Unnatural (Accidental)

**DISCUSSION**

**JUSTIFICATION OF MANNER OF DEATH**

This was an unnatural death because it occurred as a result of external cause and was accidental because the patient was taken into surgery in order to repair a VSD hence there was no intent to cause harm to the patient.

**CLINICAL PATHOLOGICAL CORRELATION**

A VSD is a congenital heart disease. It is the most common congenital heart disease. In a VSD, there is a communication between the right and the left ventricles and there is a left to right shunt. It is divided into perimembranous, infundibular and muscular VSDs where perimembranous VSDs are the most common (90%). VSDs can be small or large. Those with smaller VSDs are asymptomatic, have a good prognosis, and no therapeutic intervention is required as most of them close spontaneously. However, larger VSDs may present with congestive cardiac failure hence need therapeutic intervention. Chronic VSD presents with eisenmenger syndrome.

Small perimembranous VSDs, however, are associated with an increased risk of prolapse of the aortic cusp over time. In addition, a small but definite risk of malignant ventricular arrhythmia was reported in the Second Natural History Study.

Potential complications of surgical VSD closure include infection, postoperative bleeding requiring re-exploration, valve injury (tricuspid, pulmonary, or aortic), pulmonary hypertension with poor cardiac output, AV heart block, residual VSD with continued left-to-right shunting, and death.

**PREVENTION**

Prevention of excessive bleeding

1. Special anaesthesia techniques can minimize bleeding by safely lowering BP
2. In case anticoagulant was used, prevent excessive usage of the anticoagulant
3. Have matched blood present in order to replace blood which is lost
4. A harmonic scalpel which cuts tissues while clotting the blood almost immediately, can substantially reduce blood loss
5. An intra-operative cell salvage machine, a device that collects lost blood, washes it, and allows us to return it back to the patient, can be used to maintain healthy blood volume without transfusions.
6. A device called a non-invasive continuous haemoglobin monitor, can be used to measure haemoglobin levels without requiring a blood sample. This technology reduces or eliminates the need to send blood samples to the lab, conserving the patient’s blood.

Prevention of cardiac arrest

1. Electrocardiographic and electroencephalographic monitoring done intra-op markedly reduces the incidence of cardiac arrest in the operating room

**BIBLIOGRAPHY**

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