



## Case Report

# Death of a Neonate Due to Meconium Aspiration Syndrome: A Case Report

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### Abstract:

The authors present a death of 03 days old female infant with alleged history of obstructed labour along with meconium aspiration and perinatal asphyxia. On autopsy, fingernails found cyanosed and tip of nails were yellowish green tinged. Anthropometry of infant revealed 46.0 cm as total length, foot length 6.5 inches, 34.0 cm as head circumference, 29.0 cm as chest circumference, 25.0 cm as abdomen circumference, 13.0 cm as thigh circumference, 9.0 cm as mid arm circumference, umbilical cord stump was measured to be 3.0 cm in length and greenish tinged. On dissection, both lungs found bulky but not completely inflated, on cut section froth mixed fluid present. Blackish brown fluid seen upto terminal bronchiole. Scalp found internally ecchymosed over bilateral parieto-occipital region. All other organs were congested grossly. On histopathological examination, evidence of hemorrhage was observed in all the tissues, lung tissues revealed features of acute haemorrhagic pneumonitis, irregular wall thickening was noted in both coronary arteries along with pulmonary artery. Gross and microscopic examination suggest intrauterine stress, perinatal asphyxia, severe disseminated intravascular coagulation along with persistent pulmonary hypertension of newborn because of meconium aspiration syndrome in this case. Thus, taking all these findings into consideration, it was opined that the death was due to cardiorespiratory failure as a result of meconium aspiration and its complications.

**Keywords:** Meconium aspiration syndrome; Meconium-stained amniotic fluid; Perinatal asphyxia; Persistent pulmonary hypertension of newborn.

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### Introduction:

Meconium aspiration syndrome (MAS) is characterized as respiratory distress in newborn infants born through meconium-stained amniotic fluid (MSAF) whose symptoms cannot be otherwise clarified.<sup>1</sup> The clinical presentation of MAS varies from mild respiratory distress to life-threatening respiratory failure.<sup>2</sup> Out of

infants born with MSAF, around 2 to 10 percent of infants was seen to have MAS.<sup>3,4</sup> In one large study of approximately 500,000 singleton births, the incidence of MSAF in preterm, term, and post term infants was 5.1, 16.5, and 27.1 percent, respectively.<sup>5</sup>

### Case History:

On 04.12.2023, 03 days old female infant dead body with alleged history of obstructed labour along with meconium aspiration and perinatal asphyxia was brought to the mortuary of our institute. On reviewing the hospital records, it was found that the baby was born at full term and

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delivered by caesarean section at a government institution on 01.12.2023 at 5.25 AM with birth weight weighing about two kilograms and four hundred grams (2.400 kilograms). The age of the mother was found to be 16 years with cephalopelvic disproportion. During delivery, thick meconium-stained amniotic liquid was seen, and the baby was stained with meconium-stained amniotic fluid. The baby did not cry after birth; hence resuscitation was carried out, endotracheal intubation was done and the baby was shifted to the Special Newborn Care Unit for further management. On Day 01, the complete blood count revealed a total leukocyte count of  $48,000/\text{mm}^3$  and low pulse volume. On Day 2, prothrombin time (PT) and International normalized ratio (INR) revealed abnormal values. The clinical condition of the baby kept deteriorating and underwent cardiac arrest.

### Postmortem Examination

Eyes closed, cornea hazy, mouth closed, tongue inside, extremities straight, fists semi open, female external genitalia identifiable, lanugo hair present all over body at places, fingernails found cyanosed and tip of nails were yellowish green tinged. Umbilical cord stump found greenish tinged. Anthropometry of infant revealed 46.0 cm as total length, foot length 6.5 inches, 34.0 cm as head circumference, 29.0 cm as chest circumference, 25.0 cm as abdomen circumference, 13.0 cm as thigh circumference, 9.0 cm as mid arm circumference, umbilical cord stump was measured to be 3.0 cm in length and greenish tinged. On dissection, both lungs found bulky but not completely inflated, on cut section froth mixed fluid present. Blackish brown fluid seen upto terminal bronchiole. Fluid blood seen in the right chamber of the heart and left chamber was found empty. All other organs were congested grossly. Scalp found internally ecchymosed over bilateral parieto-occipital region.

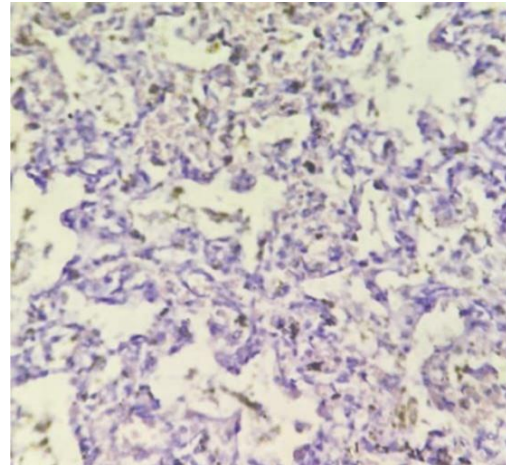


Figure 1: Lung showing hemorrhage (blue circle) and acute inflammatory cells (red circle) under 40 X magnification

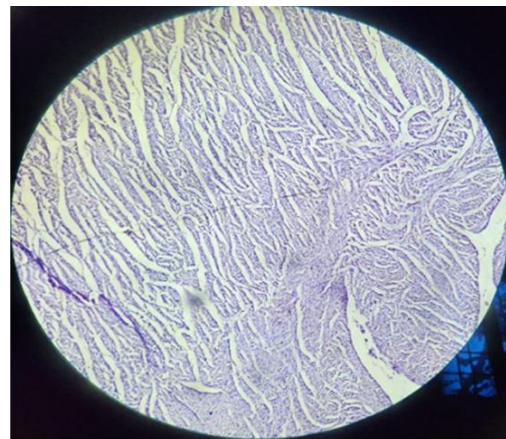


Figure 2: Left ventricle showing hemorrhage (red circle) under 10 X magnification

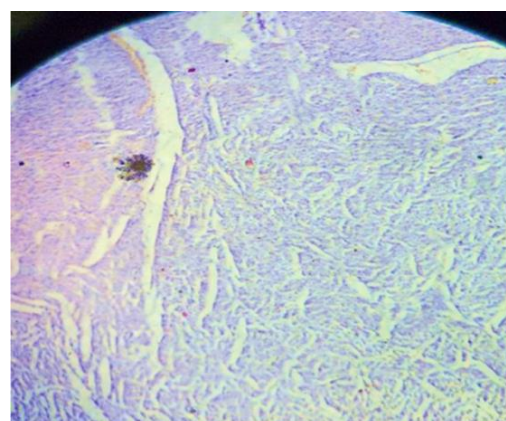
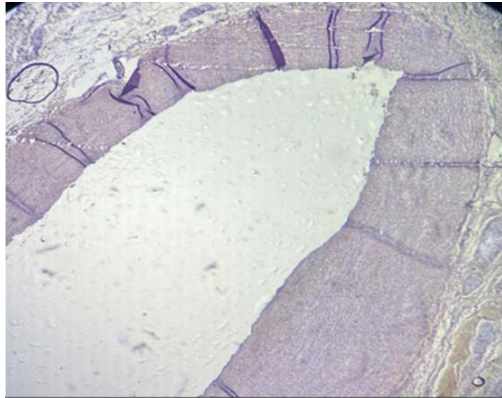
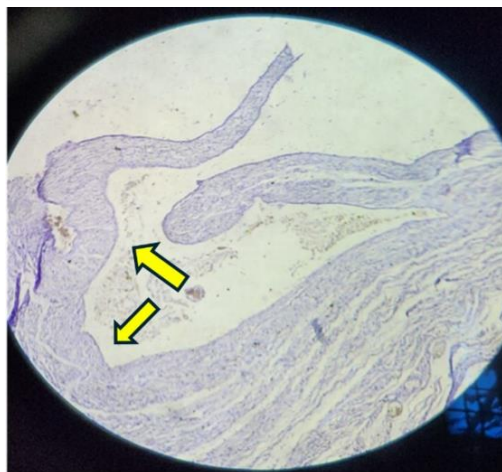


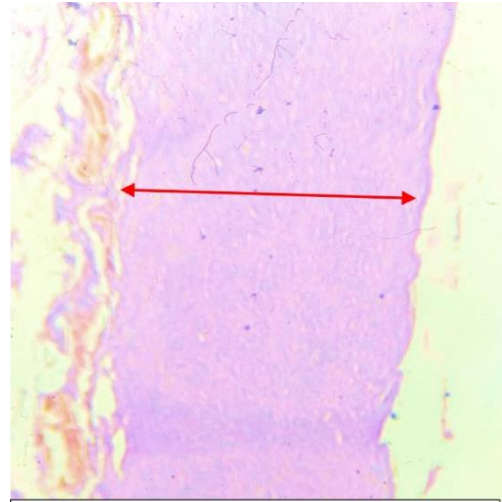
Figure 3: Interventricular septum showing hemorrhage (blue circle) under 10 X magnification



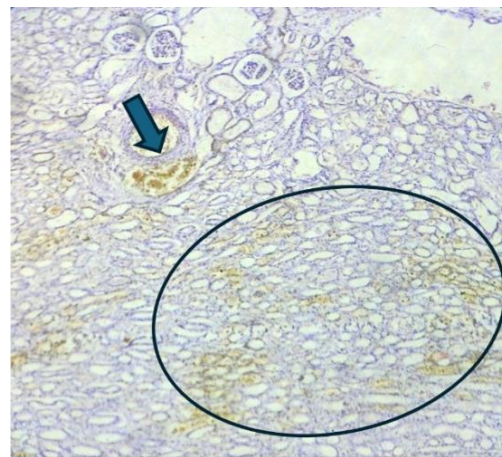
**Figure 4: Left coronary artery showing irregular wall thickening (red arrowed) under 40 X magnification**



**Figure 5: Right coronary artery revealed irregular wall thickening (yellow arrow) under 40 X magnification**



**Figure 6: Pulmonary artery showing irregular wall (red arrowed) thickening under 40 X magnification**

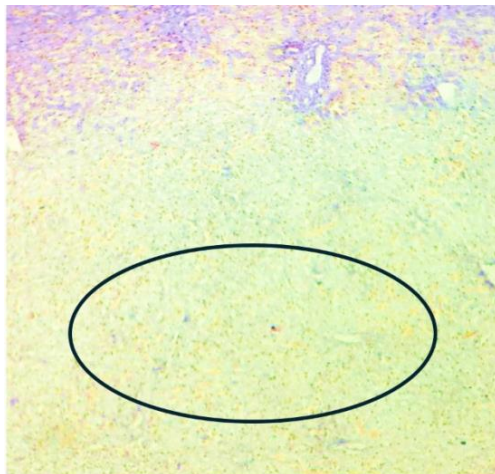


**Figure 7: Kidney showing congestion (blue arrow) and hemorrhage (blue circle) under 10 X magnification**

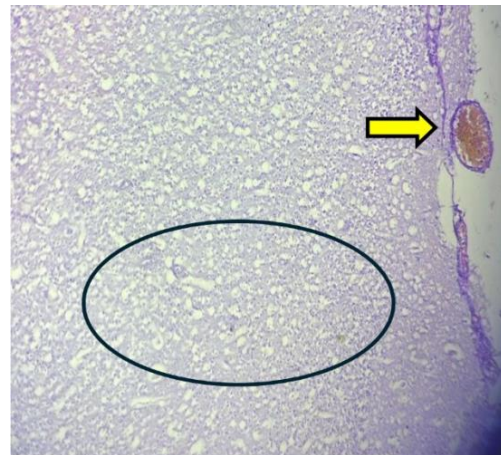
**Discussion:**

Based on the evidence such thick meconium-stained amniotic fluid which was documented in the hospital records and autopsy features such as froth mixed fluid on the cut section of lungs, presence of blackish brown fluid up to terminal bronchiole and cyanosis of fingernails confirms the perinatal asphyxia in this case. The passage and aspiration of meconium by foetus happened because of intrauterine stress. The mucopolysaccharide component of the meconium provides a favourable medium for the growth of micro-organism particularly *Escherichia coli* which can be correlated with increased total leukocyte count which was documented in treatment

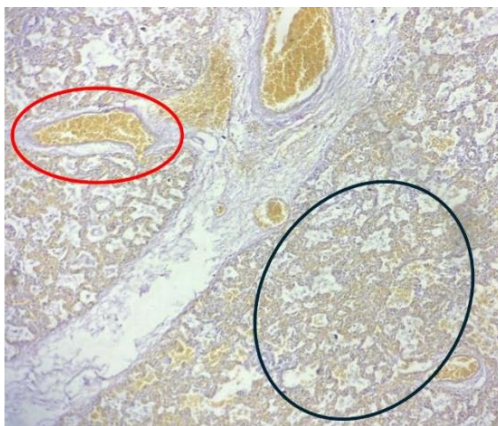
records. The presence of extensive haemorrhage in the tissues such as lungs, left ventricle, interventricular septum, kidney, liver, spleen, and brain on microscopic examination (Fig.1,2,3,7,8,9,10) confirms the diagnosis of severe disseminated intravascular coagulation (DIC) which can be related by the laboratory values such as increased prothrombin time (PT) and increased International Normalized Ratio (INR) which were mentioned in the hospital records. The cumulative effects of perinatal



**Figure 8: Liver showing hemorrhage (blue circle) under 10 X magnification**



**Figure 10: Brain showing congestion (yellow arrow) and hemorrhage (blue circle) under 10 X magnification**



**Figure 9: Spleen showing hemorrhage (blue circle) and congestion (red circle) under 10 X magnification**

asphyxia, sepsis (suggested by clinical signs and laboratory values which were documented) and hypotension (documented) caused endothelial damage and procoagulant exposure which propagates the disseminated intravascular coagulation (DIC) and resulted in severe DIC in this case. The findings such as irregular wall thickening of left coronary artery, right coronary artery, and pulmonary artery on microscopic examination (Fig.4,5,6) confirms the presence of persistent pulmonary hypertension of newborn (PPHN) caused by severe meconium aspiration syndrome in this case.

The features of acute haemorrhagic pneumonitis which were evident on microscopic examination of the lung tissues (Fig.1) confirms the pulmonary injury, airway obstruction and hypoxemia caused by the aspirated meconium by the neonate. The ecchymosis seen over the inner aspect of the scalp would have resulted from obstructed labour during the delivery of the foetus. Thus, taking all these findings into consideration, it was opined that the death was due to cardiorespiratory failure because of meconium aspiration and its complications. Death was within 24 hours since postmortem examination.

#### **Conclusion:**

The death of a neonate due to MAS holds significant medico-legal importance, particularly in cases where the cause of death is disputed or believed to be avoidable. From a medico-legal perspective, it is essential to ascertain whether adequate prenatal care and prompt interventions were carried out during delivery to manage fetal distress or signs of MAS. Failure to take the necessary measures could indicate medical negligence. Forensic pathologists must thoroughly investigate the circumstances surrounding the delivery, including medical records, to assess whether the death was a

result of natural causes or improper management, which could have legal consequences for healthcare providers involved in the care of the neonate.

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