

دراسات باثولوجية لأجنة الأغنام
المصابة بمرض حمى الوادى المتصدع

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درست الصفات التشريحية والمجهريه لعشرة اجنة أغنام وواحد جنين من أم ميتة بسبب مرض
حمى الوادى المتصدع • أخذت العينات اللازمة للفحص من القلب ، الرئه ، الكبد ،
الكليية ، الطحال ، والمعدة الرابعة • درست أهمية المرض من الناحية
الباثولوجية فى الأجنة وكذا سبب الأجهاض فى الأمهات ، وقورنت الاختلافات الباثولوجية
للمرض بين الأمهات والأجنة •

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PATHOLOGICAL LESIONS IN THE FOETUSES OF SHEEP AFFECTED
WITH RIFT VALLEY FEVER
(With 5 Figures)

By

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SUMMARY

Ten aborted foetuses and one foetus from a dead animal from a sheep flock infected with Rift Valley fever were subjected to pathological study. Macroscopically, autolytic changes of the internal organs were evident. Histopathological studies revealed findings consisted of diffuse necrotic changes in the liver, presence of exudate and foreign substances in the alveolar spaces and oedema of the alveolar septa in the lungs and degenerative changes in the heart and kidneys. Acidophilic intranuclear inclusion bodies were found frequently in the hepatic cells and are suggested to be of a diagnostic significance. It is concluded that impairment of the foetal circulation associated with hepatic destruction lead to death of the foetus in the uterus after being infected with the virus from the mother.

INTRODUCTION

Rift Valley fever is an arthropod-borne viral disease which affects both domestic animals and man, and is associated with abortion in animals. In spontaneously infected adult sheep, DICKSON (1951) described the clinical forms of the disease as peracute, acute, subacute and mild or inapparent forms

Both acute and subacute forms are characterised by rise of temperature and abortion together with other clinical symptoms such as vomiting, mucopurulent discharge from the nose, rapid pulse, unsteady gait and general weakness. In an outbreak of the disease in dairy cattle, DAUBNEY (1931) reported the occurrence of 3 deaths during the acute phase and an additional 4 deaths from sequelae such as abortions. A rise of temperature was also observed by this author. DICKSON (1951) mentioned that abortion was the only sign of the disease in some cases of infected cattle which showed general haemorrhages and oedema. According to WHO-report (1978) the Rift Valley fever virus could be isolated from freshly aborted fetuses. Despite these findings it is still not known whether foetal death and abortion is due to pyrexia which affect the mother or to other factors. It has been found worthwhile therefore, to study the changes in aborted fetuses to throw some light on the possible cause of abortion in Rift Valley Fever.

MATERIALS AND METHODS

Ten aborted fetuses and one foetus from a dead animal were derived from a sheep flock belonging to the Faculty of Agriculture, Assiut University. The animals were subjected to an outbreak at November 1978, and the disease was proved serologically to be Rift Valley Fever. After gross examination, samples from the hearts, lungs, livers, kidneys, spleens and abomasums were fixed in 10% formalin solution for **histopathological** study. The materials were processed for paraffin embedding and sections 5 to 6 μ thick were stained with haematoxylin and eosin stain and examined microscopically.

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RESULTS

Abortion was found to occur at late stages of pregnancy (Fig. 1). Gross examination of the foetuses revealed the presence of bloody exudate in both the thoracic and abdominal cavities and autolytic changes of the internal organs. Petechial haemorrhages were observed sometimes on the dorsal surface of the lung, subepicardial in the heart and subcapsular in the spleen. The liver was mostly pale greyish in colour and friable and the kidneys were soft.

Microscopical examination of the liver showed extensive degenerative changes and necrosis. As a result, structural differentiation of primitive lobules was difficult. Only occasional necrotic foci were seen including groups of hepatic cells which showed disintegration of their nuclear chromatin, however, intact erythroblasts were frequently present and accumulated between the degenerating hepatic cells (Fig. 2). No lobular distribution could be ascertained for these necrotic foci. Margination of the nuclear chromatin in a bead-form on the nuclear membrane and the occurrence of rounded to oval acidophilic intranuclear inclusion bodies were clearly observed in many hepatic cells (Fig. 3). These inclusion bodies were found sometimes to be divided into two or three smaller bodies surrounded by a single halo.

In the lung homogenously acidophilic exudate was consistently found in every case in the spaces of many early alveoli. This was mostly accompanied with the occurrence of bright orange-yellowish substances which its nature could not be identified (Fig. 4). In addition, diffuse haemorrhages were

frequently observed together with interstitial oedema, while the lumina of the bronchioles appeared mostly clear from any exudate.

The epithelial lining of the renal tubules, especially the convoluted tubules, in the kidneys showed degenerative changes (Fig. 5). The nuclei of many of these cells were lost leaving a more intensely stained acidophilic cytoplasm. The Bowman's capsule frequently showed deposition of finely granulated acidophilic exudate on its inner membrane. Degenerative changes of the heart muscles were also observed while no changes could be found in the spleen or abomasum. No inclusion bodies were detected in any organ other than the liver.

DISCUSSION

In the present study, histopathological findings indicate the probability of the contraction of infection with Rift Valley Fever virus from the mother, and its death occurred in-utero. This was evidenced by the presence of intranuclear inclusion bodies in many hepatic cells resembling to a great extent those which were previously reported to occur in adult animals of the same flock (DEEB et al. 1979). Aspiration was evident through the presence of the foreign substances in the spaces of the primary alveoli. However it has been stated that fetal aspiration, in which meconium-contaminated amniotic fluid and other particulate matter enter the lungs, is probably the result of hypoxia in utero, accompanied by increased fetal respiratory activity (ABRAMSON, 1971).

Comparative study with the pathological lesions in these foetuses with those in adult sheep (DAUBNEY et al., 1931, Assiut Vet. Med. J. Vol. 6 No. 11&12, 1979.

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FINDLAY, 1923, DEEB et al., 1979) shows that the characteristic changes in the liver of fetuses are mainly degenerative and that the inflammatory reaction in the form of leucocytic infiltration and congestion were absent, the same was also generally valid for the other organs with the exception of slight haemorrhages in the lungs.

Whether the degenerative changes in the kidneys occurred before or after intrauterine death of the foetus can not be stated. Moreover, the pathogenesis and the cause of death, and its relationship either directly to infection with the virus and or disturbances of foeto-maternal circulation, needs further investigation,

In contrast to adult sheep, in which the inclusion bodies were too rare (DEEB et al., 1979), the frequent occurrence of these intranuclear bodies indicates a great diagnostic significance for Rift Valley infection in aborted fetuses.

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Fig. (1): Aborted foetus (estimated
age 3 month).

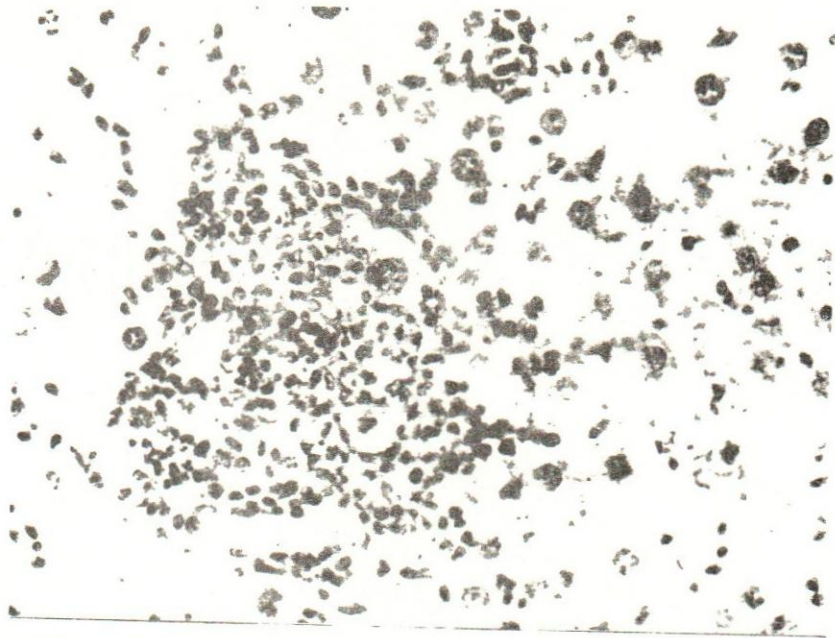


Fig. (2): Liver of aborted foetus showing a necrotic focus (x 400).

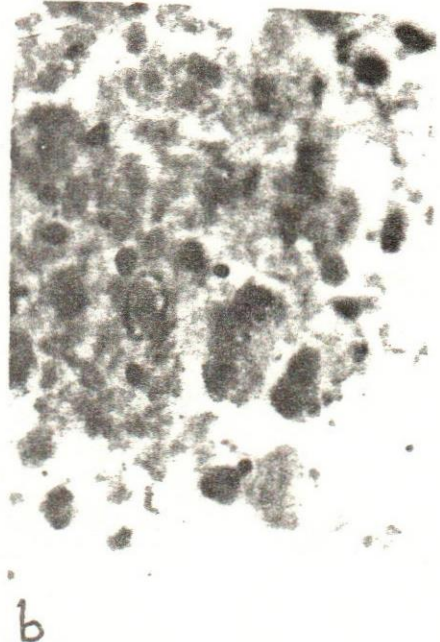


Fig. (3): (a,b). Hepatic cells having rounded to oval intranuclear bodies (x 1000)

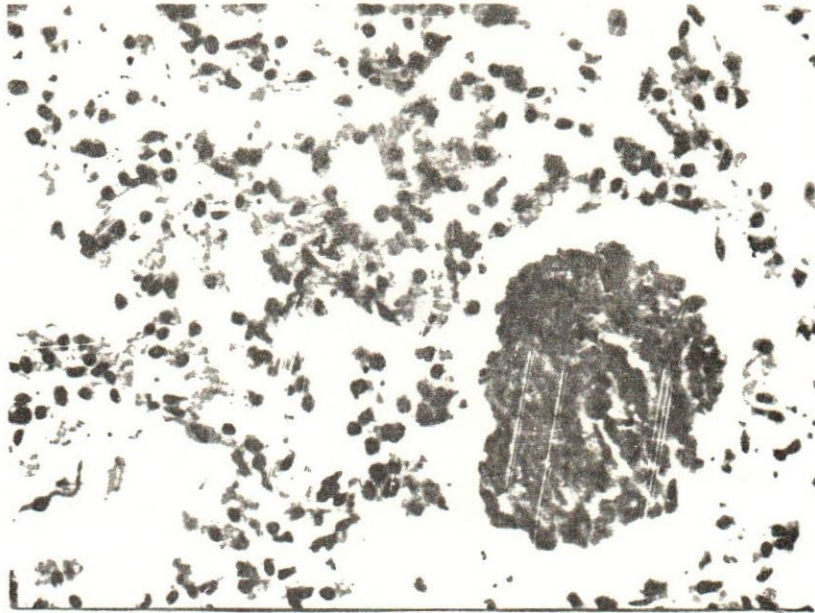


Fig. (4): Lung of aborted foetus.
Presence of foreign substance (meconium)
in the alveolar space. (x 400).

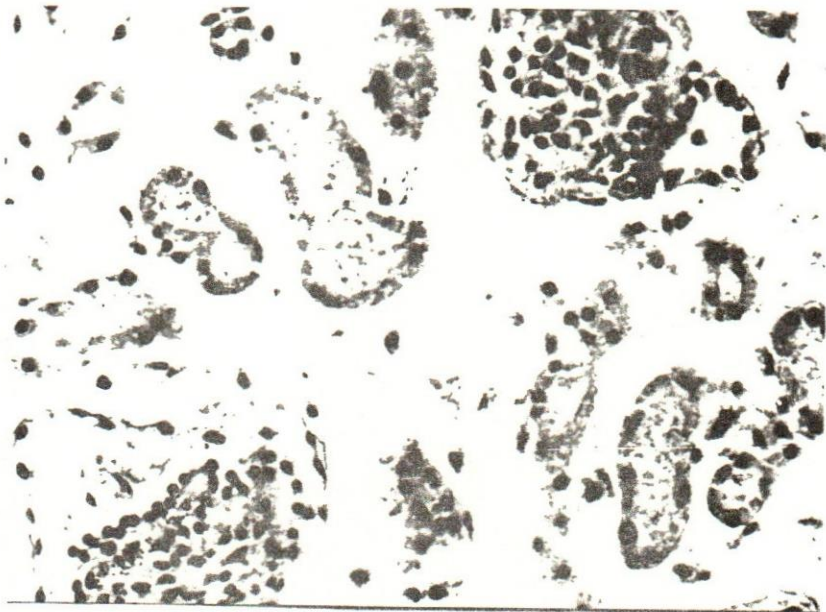


Fig. (5): Kidney of aborted foetus. Loss of the
nuclei of many epithelial cells lining
the tubules and presence of albuminous
material both in the tubules and glo-
meruli (x 400).