

Histopathologic Changes in Virus Enteritis of Mink*

by W. L. Myers and T. E. Fritz

The histopathologic changes of virus enteritis of mink (VEM) were first described by Schofield (1) in 1949. He described a pronounced swelling or "ballooning" of some of the epithelial cells lining the crypts of the small intestine as characteristic of the disease.

The clinical similarity of virus enteritis of cats (VEF) and VEM cannot be denied (2, 3). Since the first cases of VEM were seen there have been attempts to demonstrate a relationship between the two diseases.

An aid in the diagnosis of VEF are the typical granular intranuclear inclusions in the epithelial cells of the intestinal mucosa described by Lucas and Riser (4). They state that inclusions of VEF appear in the intestinal epithelium 6 days after exposure and then quickly disappear.

Smith (5) states that he has observed intranuclear inclusion bodies in the epithelial cells lining the crypts of the intestines of mink dead of VEM.

Certain basic information concerning morphology, location and staining characteristics of the inclusion bodies found in VEM is needed. The significance of the swelling of the epithelial cells lining the crypts of the small intestine also warrants attention.

MATERIALS AND METHODS

The tissues described in this paper were taken from 6 mink exposed to VEM and from 5 mink exposed to VEF. The tissues were collected 6 to 7 days after exposure to the viruses. The overt signs of disease such as anorexia, diar-

rhea and intestinal casts were usually pronounced at this time.

All tissues were fixed in Zenker's fluid for 12 to 18 hours before imbedding and sectioning using the paraffin method. The basic stain employed was Harris hematoxylin and eosin B (H&E). Feulgen's stain (6) and Shore stain (7) were also used on some sections.

Sections of intestine, liver, spleen, lymph node, bladder and trachea from mink infected with VEM were examined. Sections of intestine from mink infected with VEF were also studied.

When inclusion bodies were found in a H & E section, serial sections were then stained with Feulgen and Shore stains.

OBSERVATIONS

A pronounced swelling of some of the epithelial cells lining the crypts of the small intestine was seen in mink infected with VEM (figure 1). Many of these swollen cells were desquamated and could be found on the surface of the mucosa.

In addition, sections of small intestine also showed marked congestion, superficial necrosis and fibrin deposits on the surface of the mucosa. None of the other tissues examined presented any consistent changes.

Sections of small intestine from mink infected with VEF showed the same general inflammatory reaction. Fibrin deposits and swelling of the epithelial cells lining the crypts were not found.

Of all the tissues studied, inclusion bodies were found only in the small intestine of mink infected with VEM. Mink infected with VEF did not show any inclusion bodies.

Two types of inclusion bodies were found. The first type was found in the

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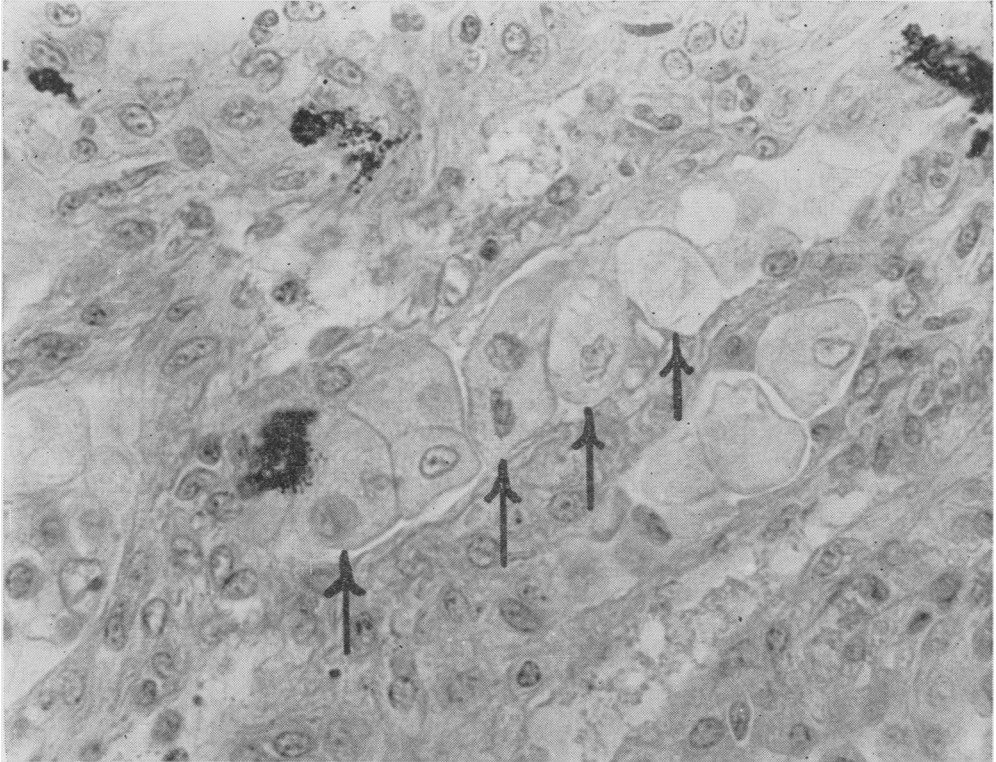


Fig. 1. Section of proximal small intestine showing pronounced swelling of some of the epithelial cells lining the crypts (arrows). H. & E stain; x 600.



Fig. 2. Intracytoplasmic inclusion bodies (arrows) in one of the swollen epithelial cells lining the crypts of the proximal small intestine. H. & E stain; x 1500.

cytoplasm of the swollen epithelial cells lining the crypts of the proximal small intestine. These were rather large homogeneous masses occurring often 2 or 3 to a cell (figure 2). In H & E sections, they were magenta and often had a surrounding halo. They stained poorly with Shore stain, being light red-brown in color and were Feulgen negative.

The second type of inclusion appeared as a granular intranuclear body in the epithelial cells of the mucosa of the proximal small intestine (figure 3). These nuclei showed margination of the chromatin and the inclusions were magenta in H & E sections. The inclusions appeared deep red-brown with Shore stain and were Feulgen negative.

DISCUSSION AND CONCLUSIONS

The swelling of some of the epithelial cells lining the crypts of the small intestine was seen only in mink infected

with VEM and not those infected with VEF. This histopathologic change, therefore, appears to be characteristic of VEM.

Since inclusion bodies can be found both in the cytoplasm and in the nuclei of the epithelial cells of the mucosa of the small intestine, they can be used as a diagnostic aid in VEM. They did not occur in mink infected with VEF.

SUMMARY

Using hematoxylin and eosin, Shore and Feulgen stains, sections of intestine, liver, spleen, lymph node, lung, bladder and trachea from mink infected with virus enteritis of mink (VEM) were examined. Sections of intestine from mink infected with virus enteritis of cats (VEF) were also examined.

A pronounced swelling of some of the epithelial cells lining the crypts of the small intestine was seen in mink

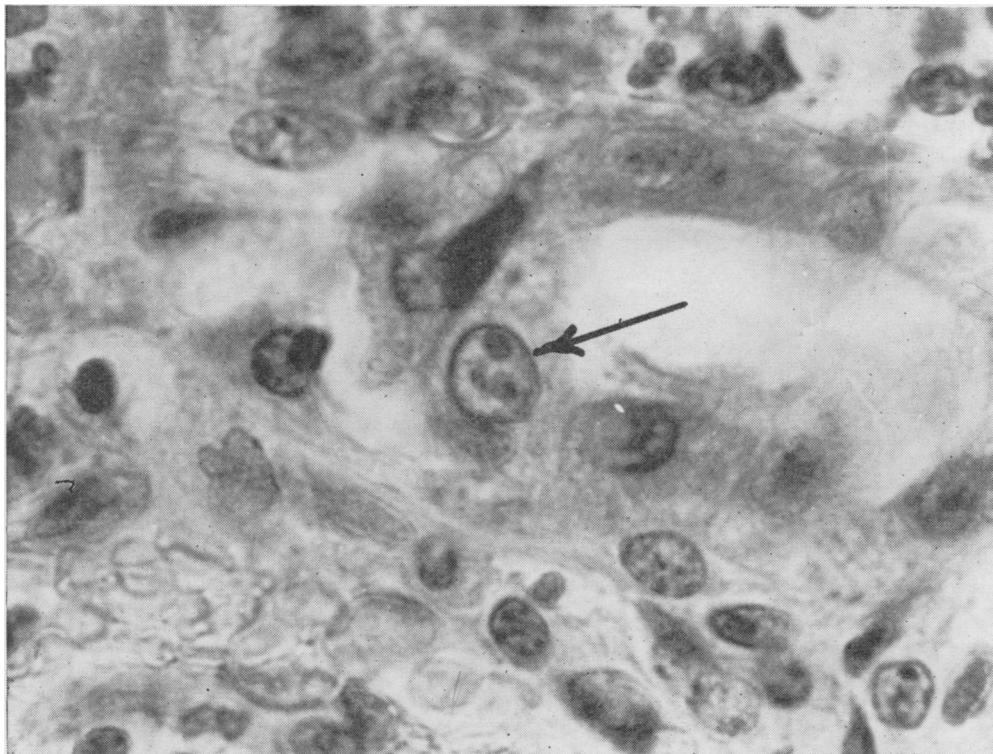


Fig. 3. Intranuclear inclusion body (arrow) in the epithelium of the mucosa of the proximal small intestine. H & E stain; x 1500.

infected with VEM, but not those infected with VEF.

Inclusion bodies were found only in the epithelial cells of the mucosa of the small intestine of mink infected with VEM. Of two types seen, one was found in the cytoplasm of the swollen epithelial cells. The second type was a granular intranuclear inclusion found in non-swollen epithelial cells.

It was concluded that these inclusion bodies could serve as a diagnostic aid in VEM.

RESUME

Les auteurs ont étudié, à l'aide de la coloration par l'hématoxyline et l'éosine et celles de Shore et de Feulgen, des coupes d'intestin, de foie, de rate, de ganglion lymphatique, de poumon, de vessie et de trachée de visons infectés avec le virus de l'entérite du vison (VEM). Ils ont aussi examiné des coupes de l'intestin de visons infectés avec le virus de l'entérite féline (VEF).

Une turgescence très prononcée de quelques cellules épithéliales tapissant les cryptes de l'intestin grêle a été observée chez le vison infecté avec le virus de l'entérite du vison mais non chez ceux infectés avec le virus de l'entérite féline.

Des corps d'inclusions ont été trouvés seulement dans les cellules épithéliales de la muqueuse de l'intestin grêle chez les visons infectés avec le virus de l'entérite du vison. Deux types ont été reconnus: un a été trouvé dans le cytoplasme des cellules épithéliales turges-

centes; l'autre, était une inclusion granuleuse intranucléaire trouvée dans les cellules non tuméfiées.

Les auteurs concluent que ces corps d'inclusions peuvent servir d'adjuvant au diagnostic de l'entérite à virus du vison.

ABSTRACT

Histopathological changes found in mink infected with virus enteritis of mink (VEM) and virus enteritis of cats (VEF) are described. In addition to the general inflammatory reaction produced in the small intestine by both viruses, there was a swelling of some epithelial cells lining the crypts in VEM. Intranuclear and intracytoplasmic inclusion bodies were found in the epithelial cells of the intestines of mink infected with VEM, but not with VEF.

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Mort du Doyen Des Médecins Vétérinaires

Le doyen des Médecins vétérinaires de la province de Québec, le Dr Paul Corbeil, vient de s'éteindre à Longueuil, après une vie extrêmement active. Né à Montréal, le 1er janvier 1876, il fit ses études au Mnt Saint-Louis et s'inscrivit, en 1892, à l'École de Médecine vétérinaire française de Montréal, d'où il termina, en 1895. Il s'installa immédiatement en clientèle et ouvrit un hôpital rue Saint-Laurent, entre les rues

Duluth et Rachel, à Montréal. Il fut pendant 35 ans médecin vétérinaire pour le département des incendies et de la police de Montréal. Pensionné de la cité de Montréal, il se retire ensuite à Longueuil et exerça sa profession jusqu'à sa mort. Il laisse dans le deuil son épouse, née Maria Durand, et une fille Berthe.

Décédé dimanche le 7 juin, ses funérailles eurent lieu à Longueuil le 10.