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MASSIVE FAT NECROSIS IN A COW

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Özet: *Bu raporda, 8 yaşındaki Güneydoğu Anadolu Kırmızısı (GAK) bir inekte rastlanan masif yağ nekrozu tanımlanmıştır. Klinik olarak, rektal muayenede rektum ve distal kolonu çevreleyen sert, tümör benzeri yapılar belirlenmiş ve tanı patolojik incelemeler sonucunda konmuştur.*

Summary: *In this report, massive fat necrosis in a 8 year-old Southern Anatolian Red cow is described. Clinically, it was observed the presence of hard, tumour-like structures surrounding the distal part of the colon and rectum during rectal examination. The diagnosis was made by post mortem and histopathological examinations.*

Introduction

Fat necrosis is a frequent finding at autopsy of the bovine (6). The etiology and pathogenesis is incompletely understood. Three forms are recorded (1). Pancreatic necrosis (2). Widespread or isolated focal necrosis of abdominal and retroperitoneal fat (3). Massive fat necrosis in cattle (6, 8). The third form is not uncommon and perhaps the most curious form in cattle as different from the other two forms (6, 8). In this form, the pathologic process occurs in any portion or all of the omental, mesenteric, and retroperitoneal fat. The lesion is readily recognized by the chalky white, lumpy to granular nodules of altered fat scattered within fat tissue (2, 3, 5, 8, 13).

Massive fat necrosis is confusing due to the various names used for appearently the same condition. In the previous reports, this form was named as bovine lipomatosis (1, 2, 3). Later, the essentially non-neoplastic character of these lesions has been agreed upon and the term bovine fat necrosis has come into usage (4, 5, 12, 13). More recently, the term of massive fat necrosis or diffuse lipogranulomatosis has been used (6).

In this report, clinical, gross and microscopic observations have a very close similarity with this form of fat necrosis in cattle.

Materials and Methods

Material of this study were constituted in 10 % neutral formalin fixed tissue samples from a cow. The animal had been slaughtered, necropsied, and submitted for cause of condition with its tissue samples and clinical and necropsy findings from Ceylanpınar Stud Farm to Department of Pathology, Faculty of Veterinary Medicine, University of Ankara, Turkey, on July 24, 1993. The tissues submitted were processed through alcohols and xylene, embedded in paraffin, sectioned at 5 to 6 micrometer, and stained with haematoxylin and eosin. Frozen sections from areas of the lesion were also prepared and stained with Oil red 0 in propylene glycol.

Results

According to the report about the animal that had been examined by a veterinary surgeon, the animal was belonged to a herd of registered Southern Anatolian Red cattle in Ceylanpınar Stud Farm in Turkey. It was 8-year-old. There was a history of long-standing infertility. Lastly, the animal had been calved normally the years previously, and six months later, a double injection of prostaglandin F2 had been administrated with 11 days intervals and then had been inseminated by artificial insemination at the observed estrus, but the pregnancy had not been achieved whereas this method had been re-

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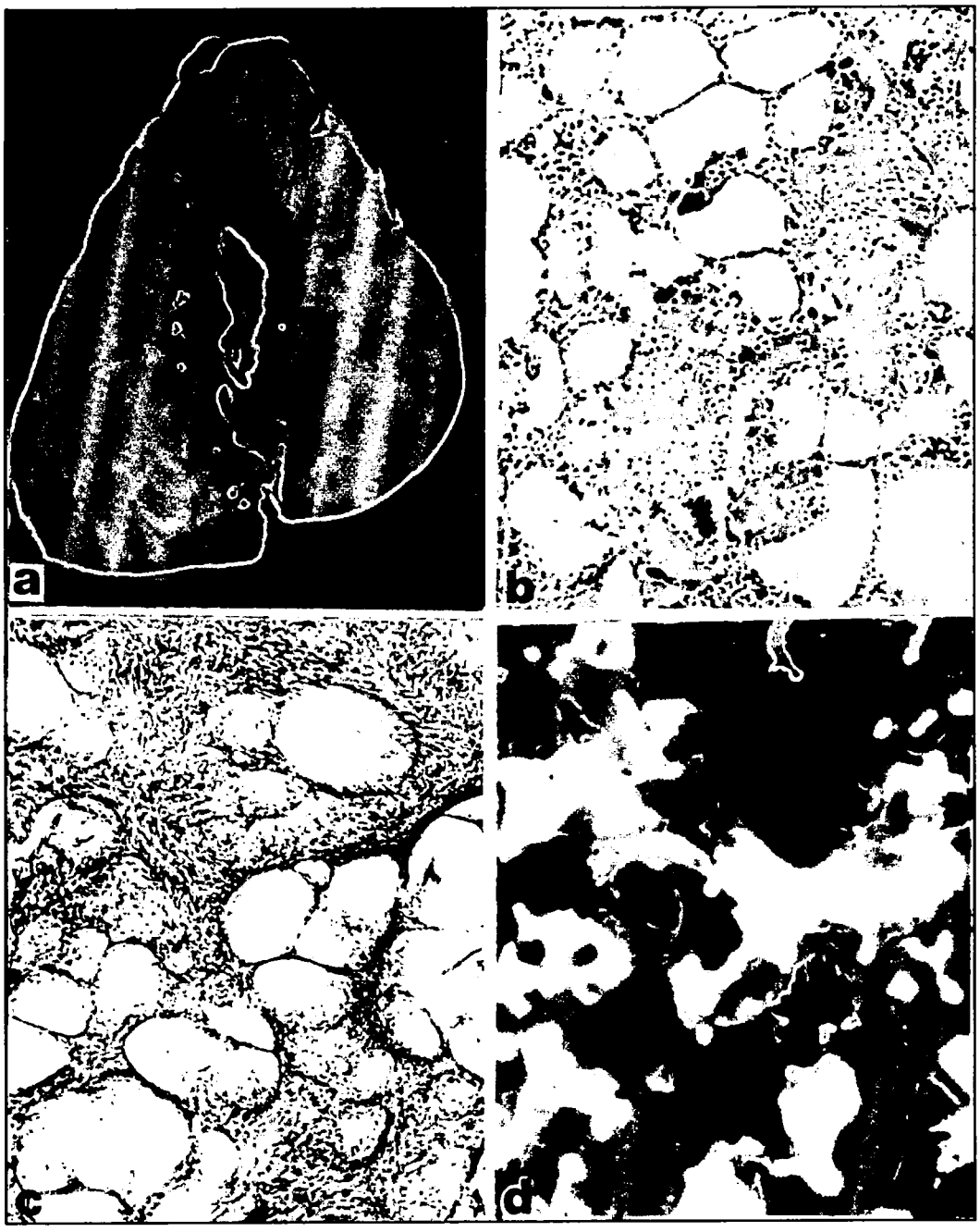

Figure 1a. Gross appearance of fat necrosis in cross-section of the colon that had been in fixative solution for several days. Notice connective tissue septums and the constricted lumen which is almost encircling by lesion.
b. Infiltration of lymphocytes, plasma cells, macrophages, and multinucleated foreign body giant cells around the lesions. H.E. x130.
c. Proliferation of fibrous tissue around the lesions. H.E. x130.
d. Crystals aggregated in star-shaped clusters and fat droplets in fat cells. Frozen section, Oil red 0, x130.

peated after eight months. During this time, rectal palpation revealed neither cross abnormalities nor pregnancy findings. Eleven months later, the condition was found when the animal was examined for the cause of infertility. At this time, clinical examination revealed that respiration, pulse and temperature were all normal. Rectal examination showed that the distal colon and rectum were completely surrounded by a large, hard, lobulated tumour-like structure. It was difficult to palpate the uterus and impossible to palpate the ovaries. A diagnosis of intestinal obstruction due to tumorous structures was made and it was decided to have the cow be slaughtered.

Post mortem examination showed that the distal colon and rectum were enveloped in masses of lipomatous tissue. Areas of the lesion were coarse, hard, almost encircling the intestinal wall, opaque appearance and whitish in color. They were surrounded by a thick fibrous membrane. The cut surface of these lesions showed lobules of fat with areas of a fibrous tissue (Fig. 1a). Lumens of the colon and rectum were constricted by this massive fatty lesions. There weren't similar lesions seen in other areas of body fat. All the organs and viscera were normal in appearance, with the exception of the ovaries of which contained cysts.

Histopathologically, the lesions were surrounded by thickened connective tissue which infiltrated deep into the lesions and divided them into many irregular lobules. Each lobule contained large fat cells. Inside the enlarged fat cells, several foam cells were lined up with a cytoplasmic range. They had slightly stained round or oval nuclei and frequently formed a syncytium. Around the lesions there were focal haemorrhages and an inflammatory infiltration of lymphocytes, plasma cells, macrophages and multinucleated foreign body giant cells (Fig. 1b). In some areas there was fibroplasia with extensive collagen formed into narrow septums or broad sheets (Fig. 1c). Most of the necrotic cells contained a fine eosinophilic, crystalline mass which caused the cells to be distended and aggregated in star-shaped clusters. These crystals were black stained in frozen sections with Oil red 0 (Fig. 1d).

Ovarian cysts observed in macroscopical examination were histopathologically found to be as luteinized cysts. The cavity of the cyst was spherical, filled by eosinophilic material, and lined by a thick layer of fibrous tissue adjacent to the zone of luteinized theca cells.

Discussion

A review of many reports which have been published on the disease indicates that identical lesions were present mainly in the adipose tissues (2, 8-10). Most of such cases have been detected at the slaughterhouse or during routine autopsy or rectal examination. In this cow, the condition was found around the intestinal wall during rectal examination, and was confirmed by post-mortem and histopathological examinations. The basic lesion was evidently identical with those of reported by several investigators (5, 6, 8, 12, 13). It is probable that the lesions had been growing for some time without causing symptoms.

In this cow the cause of infertility may be considered that was due to fat necrosis or ovarian cysts or both. Because it is well known that both cause infertility in cattle (6, 7).

As a result, it must be remembered that most of the cattle affected with clinical fat necrosis including this cow, were died or condemned, because the etiology of this disease was unknown and there was no effective treatment. More recently, however, attempt to establish the therapeutic effect of isoprothiolane on Japanese Black Cattle affected with subclinical fat necrosis was indicated satisfactory results (11).

Acknowledgement

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