

## **OVINE FAT NECROSIS (FIRST RECORD IN EGYPT)**

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### **ABSTRACT**

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Ovine lipomatosis was observed in a herd of native breed of sheep. The herd was raised in area adjacent to the desert and kept for milk production, while rams used for fattening purpose on the other hand, the herd also used for wool production. The owner paid our attention that the herd showed clinical signs in the form expressed by emaciation, loss of body condition, drop of milk yield from lactating ewes, and reproductive imperformance. Tracing the history of the herd, animals raised and kept on the rest of different typed of maize, wheat and growing grass. While, drinking water was artisan water. Selected cases of the herd were used for further biochemical analysis of some indices reflecting the fat metabolism on the other hand some cases were slaughtered for post-mortem changes. Biochemical indices included total lipids, Triglycerides phospholipids and serum selenium. Postmortem findings showed massive amount of omental adipose tissues with lumpish lesions, and massive fat depot showing lumpish lesion of calcification in mesenteric fat too. Biochemical analysis indicated that there is a marked changes in total lipidis triglycerides, phospholipids and selenium.

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*Key words: Ovine, Fat necrosis, lipogram indices*

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### **INTRODUCTION**

Abdominal fat necrosis (lipomatosis) is generally characterized by the presence of hard irregular masses of necrotic fat tissue in the mesentery perirenal fat and intestine, a myriad of terms has been applied for this syndrome in duding multiple (Carrol & Richard, 1958) lipomatus tumour (Edigson, 1952), lipofibromatosis (Moon 1954), Fettgewbsnekrose (Dirksen, 1965) and abdominal necrosis (Williams *et al.*, 1969, El-Sebaie *et al.*, 1985; El-Sebaie and Hofmann, 1992). The above mentioned researches are referred to bovine fat necrosis but there is no evidence or researches did not mentioned about the occurrence of fat necrosis in small ruminants sheep or goats, whilst the clinical picture of bovine fat necrosis are well recognized, the disease in sheep and goats is for first time diagnosed in sheep herd in Egypt.

### **MATERIALS and METHODS**

#### **Animals:**

#### **Sheep herd history:**

A native of 50 local breed of sheep was kept for milk and wall production in a desert area in east bank of Nile of Assiut Governrate where a new cultivated land. Ewes in general were emaciated and varied from 5-7 years old.

#### **Materials:**

#### **Blood samples**

Blood samples were collected by means of vein puncture, serum samples were separated and used for biochemical essay. Lipogram indices were determined including total lipids, triglycerides, and phospholipids, using Byeunicum spectrophotomer

and biochemical diagnosis kits. Selenium was measured using Beckmann, plasma Emission.

**Tissue Samples:**

Samples of necrotic fat were collected from slaughtered sheep. Tissue samples were taken from the mesenteric and perirenal fat. Samples were fixed in 10% neutral buffered formalin, dehydrated in different grades of alcohol, embedded in paraffine, sectioned at 45µ, stained with H&E and examined by light microscopy.

**RESULTS**

**Clinical Examination:**

Case history indicated that the herd suffered from marked inappetance and decrease in food intake, and milk production as well, further more reproductive disturbance. The herd grazing only on the rest of some wild grass with very little nutrition values, water resources is atrision wells. (Fig. 1, A)

**Post mortem findings:**

Some individual of sheep herd slaughtered and post slaughtered examination were carried out, the most post-slaughters findings revealed very chacteristic lesions in some cases, there was accumulation of fat in the mesentery and around, kidneys (Fig. 1, B).

Hard massive amount of omental adipose tissue with lumpish lesions classification and lumpish lesion in mesenteric tissue (Fig. 1, C,D). The presence of well circumscribed irregular areas of necrosis was exident. Some times much more denser than normal, hard, opaque-to grayish-colour and well-demarcated than white zone contaning chalk-like calcification was observed (Fig. 1, D). Advanced stage of fat necrosis revealed the presence of small nodules of necrotic fat in the areas of mesentery. In cut section revealed a dry, hard cheesy opaque appearance.

**Histopathology:**

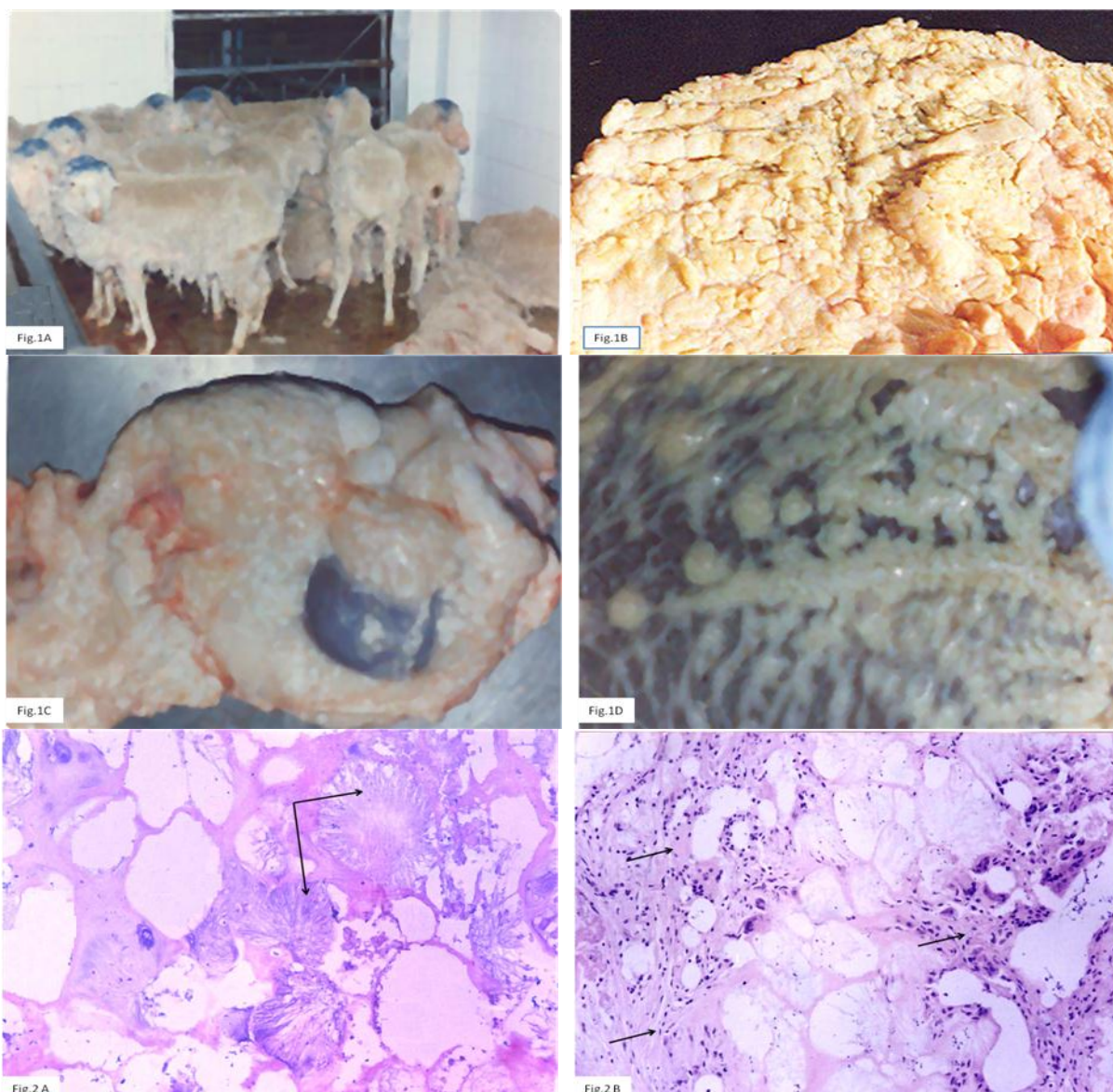
Fat necrosis was markedly seen in the adipose tissue indicated by appearance of feather like crystals. The crystals fill most of the necrotic lipocytes and take the violet colour (Fig.2, a). More there was increase in the amount of interlobular fibrous connective tissue (Fig.2, b). The presence of salty crystals in the lipocytes associated with inter lobular fibrosis give the hard texture of fat indicating advanced of chronic stage of the disease.

**Results of biochemical analysis:**

Biochemical analysis of serum revealed marked increase in the mean values of total lipids, triglycerides and phospholipids (Table 1), on the other hand mean values of serum selenium was markedly drop.

**Table (1):** Mean values of measured parameters in Healtly and diseased sheep ovine fat necrosis

| <b>Animals</b> | <b>Number<br/>n =</b> | <b>Total lipid<br/>g/L</b> | <b>Tryglicerids<br/>Mmol/L</b> | <b>Phospholipid<br/>Mmol/L</b> | <b>Selenium<br/>Ng/ml</b> |
|----------------|-----------------------|----------------------------|--------------------------------|--------------------------------|---------------------------|
| Healthy sheep  | 10                    | 4.61                       | 3.48                           | 2.02                           | 56.9                      |
|                | S.E                   | ± 2.73                     | ± 1.04                         | ± 0.35                         | ± 1.08                    |
| Diseased sheep | 8                     | 7.44                       | 10.57                          | 13.38                          | 38.40                     |
|                | S.E                   | ± 1.08                     | ± 1.73                         | ± 2.63                         | ± 2.33                    |



**Fig. Legend:**

**Fig. 1 A:** A herd of sheep suffered from fat necrosis (lipomatosis).

**B:** Hard massive amount of omental adipose tissue with lumpish lesions from the abdominal cavity.

**C:** Massive amount of prerenal fat showing lumpish lesion and calcification.

**D:** Calcification and lumpish lesions in the mesenteric tissue.

**Fig. 2 A:** Adipose tissue section from sheep, showing violet feather like crystals (arrow) fill most of lipocytes (H & E X 400).

**B:** Adipose tissue section from sheep, showing increase in the interlobular fibrous connective tissue (arrow) in the lipocytes. H X E X 400.

**DISCUSSION**

Ovine fat necrosis as herd problem in sheep herd of local breed in Egypt was reported for the first time, previously studies on bovine fat necrosis as herd problem was reported in Assiut–Egypt (El-Sebaie *et al.*, 1985, El-Sebaie and Hofmann 1988 and Hofmann and El-Sebaie, 1990). Ovine fat necrosis from the clinical signs and post mortem is considered and classified as advanced form if compared with bovine fat necrosis lipomatosis. Tracing the available

literature fat necrosis was recorded as individual cases in experimental animals (Adam *et al.* (1954), and Cox and DeDeds (1958) and Rebelin and Detds (1980).

Further more cases fat necrosis have been mentioned is association with selenium deficiency in Horse (Hartley and Dodd, (1957), Dodd *et al.* (1960); Plattand white well, (1971), Horvath, A.A H.C chany, (1926), Jubb and Kenned, (1970) and Cats (Munscn *et al.*, 1958). Steatosis is in cattle (Fat necrosis

generally is localized to abdominal fat only (Hartley and Dodd 1957). Maas *et al.* (1984) have documented a nutritional myodgeneration in Lambs of normal selenium and deficient Vit E.Status. Recent work on native breed cattle in Egypt has suggested the role of selenium deficiency in the pathogenesis of fat necrosis (El-Sebaie and Hofmann (1992)).

### CONCLUSION

Abdominal fat necrosis in general either in Bovine or Ovine fat necrosis may related to dietary factors such as long chain saturated fatty acids consumption selenium deficiency is also to be considered in the pathogenesis of fat necrosis. The lesions develop as an inflammatory response around degenerating adipose cells. The triglycerides within these cells are thought to undergo hydrolysis to glycerol and fatty acids. Remaining clumps or crystals of fatty acids serve as inflammatory foci of subsequent necrosis masses.

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### تنكز الدهن في الأغنام (التسجيل المرضي الأول في مصر)

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أجريت الدراسة لأول مره علي الأغنام البلدية – حيث قطيع من الأغنام تربي في الأماكن المستصلحة حديثاً شرق النيل بأسبوط كانت الشكوي الرئيسية من أصحاب هذا القطيع هي النحافة المفرطة قل الإنتاج من اللبن مع اضطرابات تناسلية. تم رصد العلامات المرضية ونظام التغذية ونوعية المياه التي تقدم للأغنام حيث هي أبار إرتوازية وترعى الأغنام علي بقايا الأعشاب وبعض بقايا المحاصيل من الذرة. تم ذبح بعض من هذه الأغنام التي تعاني من هذه الحالة كما تم أخذ عينات دم بغرض الدراسات الكيميائية المتعلقة بمؤشرات الدهون. أما التشريح المرضي أفاد أن هناك تنكز لتراكمت دهنية في منطقة المساريقا والدهون حول الكلية حيث أنها كثيفة القوام وبها بعض البلورات المرئية تحاليل مصل الدم للدهون الكلية والدهون الثلاثية والكوليسترول وكذلك قيم عنصر السلينيوم أفادت هذه التحاليل إرتفاع نسب الدهون الكلية والثلاثية أما معدلات الكوليسترول فكانت في نسبها الطبيعية أم عنصر السلينيوم في مصل الدم أشارت إلي نقص ملحوظ في قيمها. نخلص إلي أن هذه الدراسة هي التسجيل الأول لمرض تنكز الدهن في الأغنام سواء داخل مصر أو عالمياً – وتمثل هذه الدراسة أيضاً أنه لايد من إتباع طرق التغذية للأغنام في الأماكن القاحلة والمستصلحة – حتى تكون مكونات العلائق والأعلاف منزنة أضف إلي ذلك مصادر المياه لايد وأن تكون من مياه الشرب العادية حتى لا تؤثر العناصر النادرة علي صحة هذه الأغنام.