

S. M. El Sanousi ¹A. A. Hamad ²A. A. Gameel ³ **Abscess disease in goats in the Sudan**

EL SANOUSI (S. M.), HAMAD (A. A.), GAMEEL (A. A.). La maladie caséuse chez des chèvres au Soudan. *Revue Elev. Méd. vét. Pays trop.*, 1989, 42 (3) : 379-382.

La maladie caséuse a été décrite pour la première fois chez des chèvres naturellement infectées au Soudan. Un staphylocoque anaérobie déficient respiratoire a été isolé sous sa forme pure. Ses propriétés biochimiques ont été étudiées. La maladie a été reproduite expérimentalement chez les chèvres avec succès. *Mots clés* : Chèvre - Lymphadénite caséuse - Staphylocoque - Soudan.

INTRODUCTION

The « abscess disease » (Morel's disease) is a disease of young sheep characterized by spontaneous abscess formation in subcutaneous and, occasionally, intermuscular tissue (1, 2, 3, 9, 10) and superficial lymph nodes.

Gram-positive cocci were isolated from such abscesses by various workers, which were found to require anaerobic or microaerophilic conditions for growth (3, 6, 8). The name *Micrococcus pyogenes ovis* was given to those organisms. Recently, FUENTE, SUAREZ and SCHLEIFER (5) characterized the organisms as catalase and benzidine negative which in many biochemical respects resembled *Staphylococcus aureus*. They differ from the latter in that they lack the clumping factor, were respiratory deficient, incapable of producing acetoin and did not ferment mannitol.

The following report describes a condition similar to sheep abscess disease in Sudanese goats, the isolation and characterization of the etiological agent and the experimental reproduction of the disease.

1. Head Department of Microbiology, College of Veterinary Medicine and Animal Resources, King Faisal University, Saudi Arabia.

2. Department of Microbiology, Faculty of Veterinary Science, Khartoum, Sudan.

3. Department of Pathology, College of Veterinary Medicine and Animal Resources, King Faisal University, Saudi Arabia.

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MATERIALS AND METHODS

History of animals

Eighty, apparently healthy Nubian goats, 2-3 years of age, were kept in an enclosure at the eastern bank of the River Nile ten miles north of Khartoum. Fifteen goats (12.1 p. 100) developed abscesses in the head, neck and shoulder regions. Nine of these animals had each a single abscess in the submandibular region; four had each one abscess at the parotid area; one had an abscess at the prescapular region and the last animal had five abscesses, one in intermandibular region, another at the dorso-lateral aspect of the neck near the occipital area, the third at the ventro-lateral aspect of the neck just behind the angle of the mandible and the fourth and fifth in the cranio-lateral part of the neck (Fig. 1, 2). The abscesses were well encapsulated and doughy. Pus obtained from ruptured abscesses or by exploratory puncture was whitish creamy in colour, soft and showed no evidence of calcification.

Bacteriological methods

Pus was aseptically aspirated from closed abscesses and cultured in 10 p. 100 horse blood agar. Three sets of three plates each were prepared; one set was incubated aerobically, the second was incubated under a tension of 10 p. 100 CO₂ and the third was incubated anaerobically under a mixture of H₂ and CO₂ generated by BBL gas pak in a BTL anaerobic jar at 37 °C. Pus smears were also made, heat fixed and stained with Gram stain.

Conventional bacteriological methods were applied for identification of isolates (7).

Animal inoculation

Three male Nubian goats, two years of age were used. Growth from blood agar plates incubated anaerobically was scraped off, suspended in sterile phosphate buffered saline and the suspension then standardized to contain 2 x 10⁸ organisms. Equal volumes of the



Photo 1



Photo 2

bacterial suspension and 2.5 p. 100 calcium chloride solution were mixed aseptically; the latter causes necrosis of tissues. One ml of the mixture was used to inoculate each of two goats subcutaneously at the ventro-lateral aspect of the neck caudal to the angle of the right mandible. The third goat was similarly inoculated but with the mixture of 0.5 ml of 2.5 p. 100 calcium chloride and 0.5 ml phosphate buffered saline. The animals were carefully examined daily for appearance of lesions and rectal temperature was recorded twice a day, morning and evening.

Treatment

In the naturally infected goats ruptured abscesses were evacuated from pus and cleaned with tincture of iodine while intact ones were extirpated surgically. Antibiotic treatment with tetracycline was given for four successive days.

RESULTS

No growth was observed in blood agar incubated aerobically. Scant growth was obtained in plates incubated at 10 p. 100 CO₂ after 48 hours. A more

luxuriant growth was obtained from blood agars incubated anaerobically for 48 hours. The colonies were minute (0.6 mm in diameter), smooth, entire, low convex, opaque, greyish white and butyrous. Further storage at 4 °C led to the formation of a narrow partial zone of α -haemolysis.

Smears prepared from anaerobic cultures showed Gram-positive cocci arranged singly, in pairs and rarely in groups. The organisms were partially acid fast, and resisted decolourization by weak acids including 0.5 p. 100 acetic acid.

The different biochemical properties of seven isolates are presented in table I. The organisms were catalase negative, fermented glucose, sucrose and mannose, showed variable reactions with fructose, galactose, rhamnose and arbinose; failed to ferment maltose, xylose, lactose, raffinose, trehalose, glycerol, inositol, sorbitol salicin, dulcitol and inulin.

The two goats inoculated with the culture suspension had only a transient rise in temperature two days after inoculation. In each animal a diffuse swelling appeared at the site of inoculation three days post-infection. This became well defined abscess in four days and reached the size of an orange by the sixth day (Fig. 3).

Smears made from aspirated pus showed Gram-positive cocci, similar to those inoculated, in pure form.

TABLE I Biochemical properties of organisms isolated from goat abscesses.

Test	Strain						
	IA	IB	II	III	IV	V	VI
Catalase	—	—	—	—	—	—	—
Oxidase	—	—	—	—	—	—	—
Aerobic growth	—	—	—	—	—	—	—
Microaerophilic	w	w	w	w	w	w	w
Anaerobic	+	+	+	+	+	+	+
Haemolysis	+	+	+	+	+	+	+
O.-F.	—	—	—	—	—	—	—
Pigment	—	—	—	—	—	—	—
V.P.	—	—	—	—	—	—	—
M.R.	—	—	—	—	—	—	—
Nitrate	—	—	—	—	+	—	—
Citrate	—	—	—	—	—	—	—
Aesculin	—	—	—	—	—	—	—
Malonate	—	—	—	—	—	—	—
Gelatin	—	—	—	—	—	—	—
Coagulase	+	+	+	+	+	+	+
Urease	—	—	—	—	—	—	—
DNase	+	+	+	+	+	+	+
Phosphatase	+	+	+	+	+	+	+
Growth on 110 medium	—	+	—	—	—	—	—
Baird Parker	+	+	+	+	+	+	+

w = weak growth.



Photo 3

Cultures incubated anaerobically revealed colonies typical to those obtained from natural cases, with similar biochemical properties and sugar fermentation. The control goat developed no lesions at the site of inoculation.

DISCUSSION AND CONCLUSIONS

The goats under study developed abscesses in subcutaneous tissue without involvement of lymph nodes. This largely excludes infections with *Corynebacterium ovis*, the frequent cause of caseous lymphadenitis in sheep and goats. The organisms isolated from these abscesses were anaerobic, catalase negative, Gram-positive cocci which were capable of producing abscesses in goats when inoculated subcutaneously. In many cultural and biochemical characteristics they bear close resemblance to *Micrococcus abscedens ovis* (3, 5) and the respiratory-deficient staphylococci (8) isolated from sheep, suggesting that the condition in goats is similar to the « abscess disease » of sheep.

Goats are considered to be naturally resistant to the disease although experimental infection has been established. However, VALENTI & BIELER (11) isolated Gram-positive cocci similar to *Micrococcus abscedens ovis* from spontaneously developing abscesses in goats and this seems to be the first indication of the occurrence of « abscess disease » in goats ; the present report makes the second.

The abscesses in goats were mainly observed in the head and neck region suggesting that infection is established through skin abrasions or wounds made by sharp objects or metallic feeding and watering troughs. Affected goats were 2-3 years of age and young animals were not available among the flock to compare their susceptibility. However, in the sheep disease, young animals, 4-5 month old appear to be mainly affected (3, 8).

The observation that the presently isolated organisms were partially acid fast and resisted decolourization by weak acids could be of some value in suggesting a quick diagnosis of the « abscess disease » prior to bacteriological confirmation.

We add our voices to BUCHANAN & GIBSONS (5) in that the present judgement of the species to the genus *Peptococcus* will doubtless require revision as urgently needed modern data became available.

S.M. El Sanousi, A.A. Hamad, A.A. Gameel

EL SANOUSI (S. M.), HAMAD (A. A.), GAMEEL (A. A.). Abscess disease in goats in the Sudan. *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (3) : 379-382.

The « abscess disease » was described in naturally infected goats for the first time in Sudan. An anaerobic respiratory deficient staphylococcus was isolated in pure form. The biochemical properties were studied. The disease was successfully reproduced in experimental goats. *Key words* : Goat - Abscess disease - Staphylococcus - Sudan.

EL SANOUSI (S. M.), HAMAD (A. A.), GAMEEL (A. A.). La linfadenitis caseosa en las cabras en Sudán. *Revue Élev. Méd. vét. Pays trop.*, 1989, **42** (3) : 379-382.

Se describió la linfadenitis caseosa por primera vez en cabras naturalmente infectadas en Sudán. Se aisló un estafilococo anaerobio deficiente respiratorio bajo su forma pura. Se estudiaron las propiedades bioquímicas. Se reprodujo con éxito experimentalmente la enfermedad en cabras. *Palabras claves* : Cabra - Linfadenitis caseosa - Estafilococo - Sudán.

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