

GROSS AND HISTOPATHOLOGICAL INVESTIGATION OF GRANULOMAS OF UNKNOWN ETIOLOGY IN SHEEP AND GOATS IN DUHOK ABATTOIR

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ABSTRACT

Granulomas are masses of tissue reaction resulted as well from of infection, inflammation or presence of foreign bodies. The present study was conducted to investigate the gross and histopathological features of granulomas of unknown etiology. Twenty seven cases of granulomas were collected from the lung of sheep and goats. The gross lesions of granulomas were small to large nodules, white to gray in color, and hard in palpation. Histopathologically, all granulomas were undergone caseous necrosis which surrounded by inflammatory zone and most importantly presence of multinucleated giant cells. This study differentiates the granulomas from other lung lesions based on gross and histopathological finding.

INTRODUCTION

A distinctive type of chronic inflammation is called granulomatous reaction in which many indigestible pathogens, foreign body, and other irritants are involved. Pathologically, granuloma is distinguished by presence of chronic inflammatory cells like mononuclear cells, epithelioid cells, and multinucleated giant cells (1). The core center of granulomas is composed of necrotic tissue. Necrosis is classified into different types based upon the irritants, its severity, duration, and tissue involved(2). Many factors and etiological agents are recorded to be the cause of granulomas like infectious agents, chemical and physical factors, immunologic reactions and neoplasia are most frequently observed (3). This form of necrosis is particularly common in sheep, goat and cattle

especially in cases of tuberculosis and caseous lymphadenitis. Lesions of these diseases are granulomatous reaction and characterized by formation of caseous necrosis in the center of lesions (4). Furthermore, some parasitic and fungal disease also produces focal areas of caseous necrosis in the wall of intestine and adjacent tissues (5, 6). Necrosis should be differentiated from other conditions like autolysis. Other conditions like apoptosis or programmed cell death have been used virtually synonymously and refer to individual cell death in a variety of processes (7). Many diseases have been reported to cause granuloma-like lesion, therefore this study is conducted to study gross and histopathological feature of caseous necrosis of a granulomatous nodules in lung of sheep and goat.

MATERIAL AND METHODS

A total of twenty seven of granulomatous lesions were identified. All samples with gross feature of granulomas were taken from infected lung of sheep and goats. The granulomatous nodules were examined macroscopically and histopathologically. A gross inspection of lesions with respect to the shape, size, color and consistency of the lesions were recorded. Histopathological examination was done at histopathology and molecular laboratory at college of Veterinary Medicine, Duhok Research Center. For histopathological studies, all specimens with typical lesions from infected lung, were collected and fixed in 10% neutral buffered formalin saline solution. Tissues were dehydrated in ethanol using different concentration, cleared in xylene, and embedded in pure white paraffin wax at melting point 56-58°C for preparation of paraffin block. The processed and embedded tissue sections were cut at 3-4 µm with Leica microtome (Leica, Germany). Slides were stained using hematoxylin and eosin (H &E) stain according to (8).

RESULT

A. Macroscopical feature

The macroscopic feature of granulomas characterized by presence of dry nodules varied in size. Some nodules were small other were large which involved all part of lung. The color of the nodules was white or gray and the consistency of nodules was

hardon palpation. Upon opening of nodules,a creamy yellowish material with bad odor resembling of curds of cheese came out. The necrotic tissue was enclosed with a connective tissue capsule(Figure1).

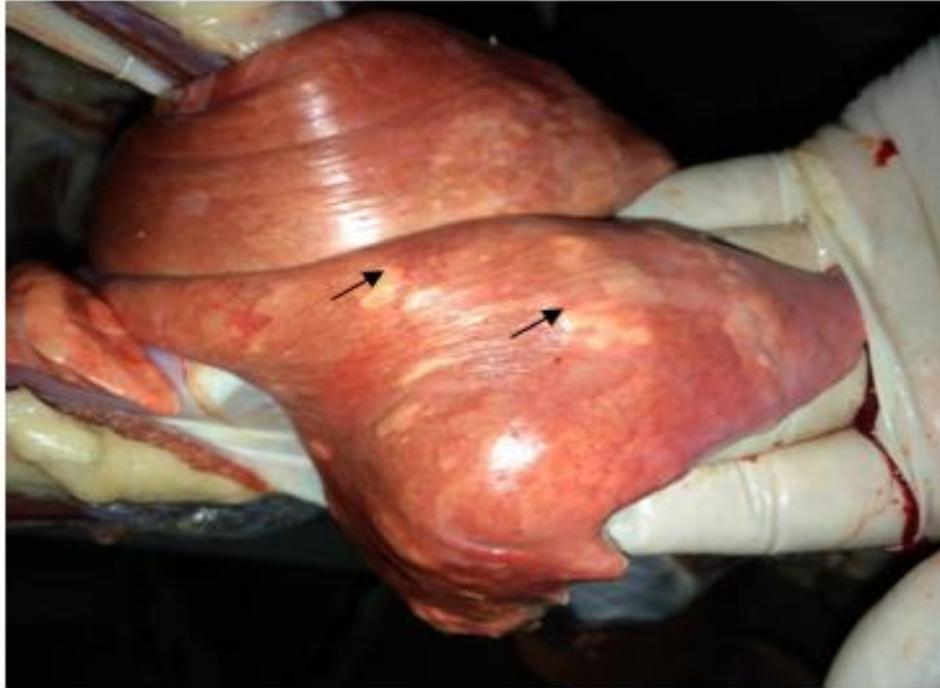


Fig.;1: several mass nodules appear at the surface of lung and Which represent a granulomatous reaction (black arrows).

B. Microscopical feature:

Histopathological examination of tissue section from infected lung appears as focal area of necrosis called granulomatous reactions. The center of granulomatous reaction was undergone caseous necrosis and the area surrounded by a zone of inflammatory cells mainly lymphocytes and macrophages(Figure2, 3). One of the definite important features associated with caseous necrosis is presence of large cells and multinucleated cells called Giant cell. All the necrotic tissue and inflammatory cells reaction cause stimulation of fibroblast which results in encapsulation of necrotic material by a thick fibrous connective tissue with deposition of calcium salts(Figure4, 5).

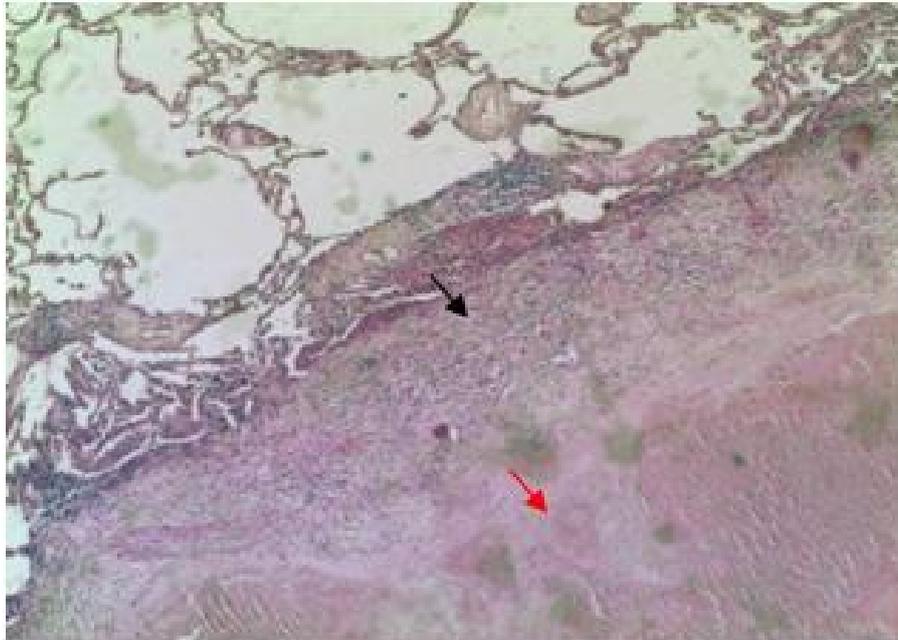


Figure-2: Caseous necrosis of lung. The necrotic area lacks cellular and tissue architectural details (red arrow) and separated from the viable tissue by a zone of inflammatory cells (black arrow) H&E (10X).

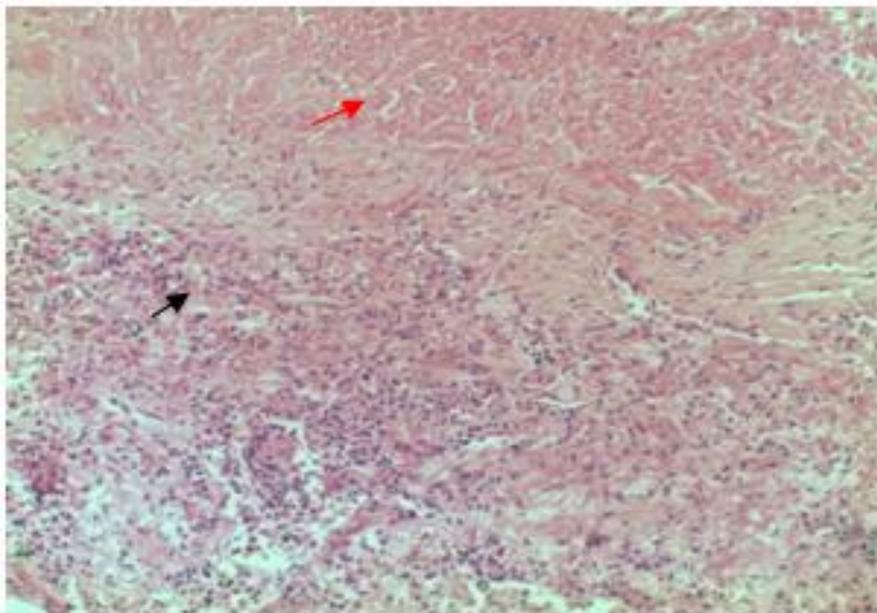


Figure-3: Caseous necrosis of lung in the center (red arrow) surrounded by clear zone of severe infiltration of inflammatory cells (black arrow) H&E (20X).

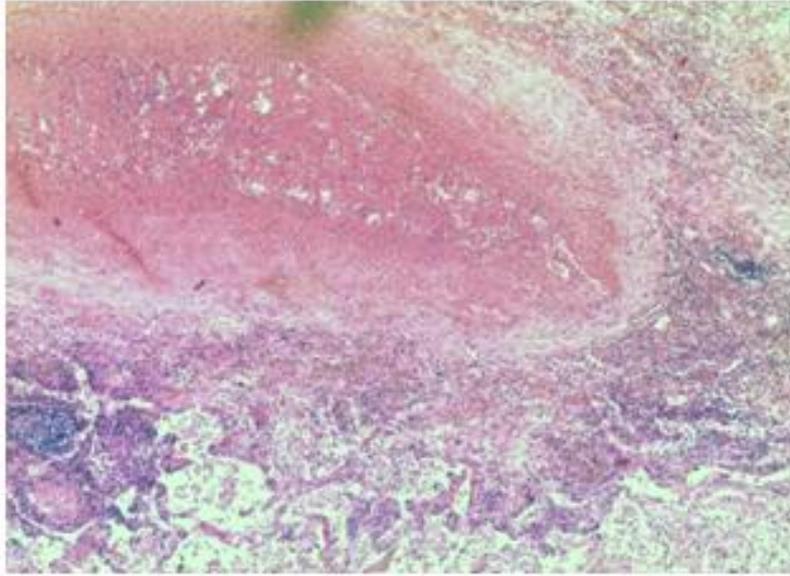


Figure-4: The Granulomatous reaction (granuloma) like nodule consist of necrotic area appears as cheesy material in the centre of lesion with calcification surrounded by different layers of inflammatory cells and connective tissue

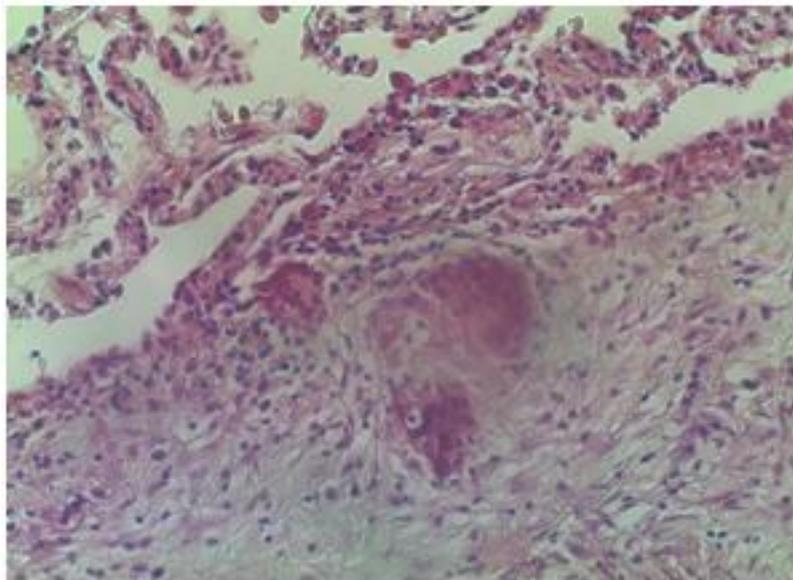


Figure-5: The zone of inflammatory reaction consist of lymphocytes, macrophages and giant cells H&E (20X)

DISCUSSION

Caseous necrosis and granulomatous reaction are considered one of the most important lesions associated with variety of diseases such as caseous lymphadenitis, Tuberculosis, John's disease, Histoplasmosis, and some of chronic fungal and parasitic diseases (7). A granuloma is a small area of inflammatory reaction in tissue associated with aggregation of inflammatory mediated cells such as lymphocytes, macrophages, fibroblast and other inflammatory cells. The cause is chiefly as the result of an infection which occur frequently in the lungs, but can occur in other parts of the body as well (9). Two patterns of granulomatous lung disease are recognized, foreign-body reactions and immune-mediated granuloma (10). The results of the current study are in accordance with the results of previous reports (6, 10, 11). The center of granulomatous lesions consist of caseous necrosis, which appears cheesy in consistency and yellowish to green in color surrounded by a line of demarcation separated with vital area from infected area. This might be an indication the chronic reaction as response to chronic inflammation with infiltration of chronic inflammatory cells like lymphocytes, macrophages and giant cells (12, 13). The fibrous connective tissues which surround the necrotic area mean activation of fibroblasts (14). Conducting additional studies are important to recognize and identify the characters, type of necrosis and etiological agents in the different granulomatous inflammations. The importance of these studies is not only limited for its theoretical value, but also for its potential clinical, zoonotic, and economic implications.

التقييم العياني والمرضية النسجية للتنخر التجبني للاغنام والماعز في مجزرة دهوك

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الخلاصة

أن الاورام الحبيبية هي عبارة عن كتل نسيجية ناتجة كرد فعل للانسجة المصابه بالتهاب أو عدوى او وجود جسم غريب فيها . اجريت هذه الدراسة للتحقيق في الملامح العيانية والمرضية النسجية للاورام الحبيبية المجهولة السبب. تم جمع 27 حالة من آفات الورمية الحبيبية من رئة الاغنام والماعز وكانت الافات العيانية للورم الحبيبي صغيرة الى كبيرة الحجم ، بيضاء الى رمادية اللون وذات ملمس صلد . أما الافات المرضية النسجية فقد اظهرت الدراسة ان كل حالات الاورام الحبيبية كانت تعاني من تنخر جبني محاط بمنطقة التهابية تحتوي على خلايا عملاقة متعددة النوى . ان الهدف من الدراسة الحالية هو تمييز الاورام الحبيبية عن آفات الرئة الاخرى للاغنام والماعز على اساس الملامح العيانية والمرضية النسجية.

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