

## SWOLLEN HEAD SYNDROME IN BROILER CHICKENS

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### SUMMARY

The clinical, microbiologic and pathologic findings of swollen head syndrome in broiler chickens in Iraq are reported in this study. A consistent clinical feature of this syndrome was swelling of the face. The facial subcutaneous tissue, conjunctivae and nictitating membranes were edematous. Microscopically, there was acute or chronic dermatitis and cellulitis characterized by necrosis of the dermis and subcutaneous tissues, with infiltration by heterophils in acute cases and by macrophages and giant cells in chronic cases. *Escherichia coli* was constantly isolated from the facial subcutaneous tissue.

### INTRODUCTION

Swollen head syndrome (SHS) is a newly described disease entity that occurs in broiler chickens in South Africa (Morley and Thomson, 1984). Clinically, the syndrome is characterized by swelling of the face, wattles and conjunctivae. *Escherichia coli* and a coronavirus have been incriminated as the cause of this syndrome which could be reproduced experimentally with *E. coli* only. A condition similar to that reported from South Africa is commonly recognized in broiler chickens in Iraq. The purpose of this study is to report the microbiologic findings and to describe the gross and macroscopic lesions of SHS in broiler chickens.

## MATERIALS AND METHODS

Broiler chickens of different ages were brought daily to the central veterinary hospital in Baghdad; owners were seeking diagnosis and treatment for different diseases. Swollen faces were seen in chickens aged 3-6 weeks, and during a period of two months, 23 cases from nine farms were investigated. Chickens were examined clinically before being killed then, skin over the mandible and the intermandibular region was dissected and examined grossly. The subcutaneous tissues were cultured on both blood and McConkey's agars. Samples from the skin were fixed in neutral buffered 10% formalin and then processed for histologic examination.

## RESULTS

### Case histories

In most cases, the complaints of owners were unusual mortalities and respiratory rales in chickens, and swelling of faces of individuals.

### Clinical signs

There was swelling of the face and reddening of the skin particularly over the mandible, in the intermandibular region and around the eyes (Fig. 1). The swelling varied in severity among chickens and was either unilateral or bilateral. In many cases, the conjunctivae and nictitating membranes were edematous and in some cases hemorrhagic. In severe cases, the eye in the affected side was closed.

### Gross lesions

The skin over the mandible and the intermandibular region was thickened, and the subcutis was edematous and gelatinous. In some cases, there was creamy and/or cheesy material in the subcutis.

### Microscopic lesions

Microscopically, the lesions were related to acute or chronic inflammatory and necrotizing dermatitis and cellulitis. In acute cases, the dermis and subcutaneous tissue contained zones and foci of necrotic heterophils which replaced the



Fig. 1 A case of SHS. The face is markedly swollen and the eye is closed.

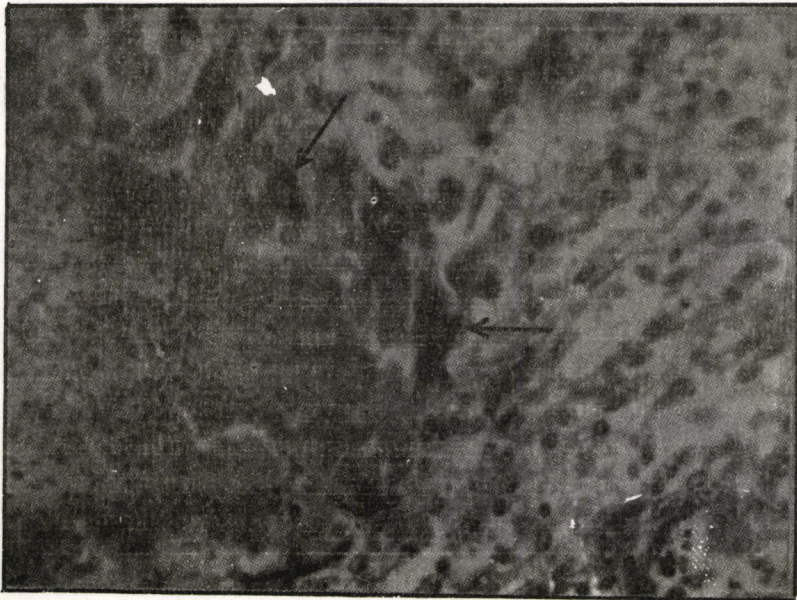


Fig. 2 Section from the skin over the mandible from a chronic case of SHS. An area of necrosis is rimmed by a zone of giant cells and macrophages. Arrows indicate giant cells.

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dermal and subcutis landmarks. The tissue between these zones and foci was altered by fibrinous exudate through which numerous heterophils were scattered. In chronic cases, the lesions were those of necrotizing granulomatous dermatitis and cellulitis. The dermis and subcutaneous tissue contained areas composed of pyknotic nuclei and amorphous eosinophilic debris. Each necrotic area was rimmed by a zone of giant cells, followed by a collar of macrophages and fibroblasts with few heterophils (Fig.2). Between the necrotic areas there was an intense cellular infiltrate consisting predominantly of macrophages with few lymphocytes. Lymphocytic perivascular cuffs were prominent in the dermis and subcutaneous tissue. Small bacterial colonies were present within some necrotic tissues.

#### Microbiologic finding

A pure culture of *E. coli* was isolated from all cases.

#### DISCUSSION

The clinical signs and the gross lesions of SHS observed in chickens in this study were similar to those reported by Morley and Thomson (1984) from South Africa. In the original report of SHS, *E. coli* and a coronavirus were consistently isolated from the facial subcutaneous tissue of affected chickens. In this study, *E. coli* was also consistently isolated, but viral isolation was not attempted. The microscopic lesions may suggest that localization of *E. coli* in the facial subcutaneous tissue initiates an acute inflammation which is followed by chronic necrotizing inflammation. *E. coli* is known to cause granulomatous lesions in visceral organs in chickens and turkeys - coligranuloma (Gross, 1978).

Further studies are needed to explain the pathogenesis of this syndrome.

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### متلازمة انتفاخ الرأس في دجاج اللحم في العراق

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### الخلاصة

تمت دراسة النواحي السريرية، المايكروبيولوجية والامراضية لمتلازمة انتفاخ الرأس في دجاج اللحم في العراق. تميزت هذه الحالة بانتفاخ الوجه مع وجود وذمة في الانسجة تحت الجلد للوجه وفي الملتحمة والغشاء الرامش. اظهر الفحص النسيجي للجلد في منطقة الوجه وجود التهاب حاد او مزمن تميز بوجود مناطق تنخر في الادمة وفي الانسجة تحت الجلد مع ارتشاح خلايا الهتروفيل في الحالات الحادة والخلايا البلعمية والعملاقة في الحالات المزمنة. تم عزل الاشريشيا القولونية من الانسجة تحت الجلد لكل الحالات.