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SOME PATTERNS OF AFFECTIONS OF THE TIBIOTARSAL ARTICULATION IN CATTLE

(With One Table and 7 Figures)

By

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نماذج لبعض اصابات مفصل العرقوب بالماشية

ابراهيم أبو ســـريـــع

تمكن الباحث من خلال هذه الدراسة من تتبع عدد (١٢) حالة منها (٩) حالات لعجول تسمين كانت تعاني من الالتهاب الارتشاحي و(٢) بقرة مدره للبن تعاني من الالتهاب الصديدى وكذلك بقرة واحـــدة تعاني من التهاب مزمن بمفصل العرقوب . هذا وقد أمكن توصيف الاعراض الاكلينيكية لمثل هـــــذه الاصابات وكذلك اجراء مقارنة بين الخواص الطبيعية للسائل المفصلي في حالات الالتهاب الارتشاحي والصديدى كما أجريت فحوص اشعاعية لحالة الالتهاب المزمن وقد وجد أنها تعاني من تمعظم بالاسطح الداخيلية لأغلب الأجزاء المكونة للمفصل. وقد عولجت حالات الالتهاب الارتشاحي بنجاح تام بينمـــا حالات الالتهاب الصديدى أعطيت تحسن طفيف بينما حالة الالتهاب المزمن لم تستجيب لأى عـــــلاج نظرا لحدوث تغيرات باثولوجية بالسطح المفصلى للمفصل المصاب .

SUMMARY

Three different forms of arthritis of the tibiotarsal articulation were recorded. These affections were traumatic hydrathrosis in calves kept for beef production (9), Septic arthritis (2) and one case exhibited degenerative arthritis in a fresian dairy cow.

All cases of traumatic hydrarthrosis gave good recovery following the application of one injection, while the septic arthritis resulted in severe local and systemic reactions with moderate improvement.

Degenerative arthritis showed some radiological changes characterized by wide areas of degeneration beside, osteophytic reactions at the tibiotatrsal and proximal intertarsal joints as well as narrowing of the distal intertarsal joint.

INTRODUCTION

Tarsal hydrathrosis in cattle was dealt with by VAN PELT and CONNER (1963), VAN PELT and LANGHAM (1968) GREENOUGH, MacCALIUM and WEAVER (1981). They found that the tibiotarsal joint in cattle was the most frequently involved (56%) and infective arthritis of that joint occurred mainly in dairy cows confined to stantions for long periods. The cow stood with the affected limb in a semiflexed position and the synovial effusion was turbid yellow containing flacculent material.

Synovial fluid from normal tibiotarsal and femeropatellar joints of buffaloe is in general viscus, colourless and clear with the exception of few cases which showed

pale yellow colouration (BOLBOL, 1975).

This affection in equines was described by VAN PELT (1963 & 1968) and ADAM'S (1974) as a chronic destension of the tarsal joint capsule due to excessive synovial effusion (Bog Spavin). Unilateral tarsal hydrarthrosis occured more frequently than the bilateral one.

In this work, the clinical observation, the radiological changes as well as the physical characters of synovial effusion were carried out to evaiuate these joint effections in cattle. Treatment was tried in some cases.

MATERIAL and METHODS

The materials of this work were 9 calves 18-20 months kept for meat production and 3 dairy cows 3.5-5 years old. All cases were clinically observed and carefully examined at the hock region of both limbs.

Samples from the synovial effusion were aseptically collected from the anteromedial pouch of the tarsal capsule for physical examination as a rapid field test with special emphasis to the mucin clot quality (VAN PELT, 1963).

The affected calves were subjected to aseptic evacuation of the extra-synovial effusion, then injected intra-articularly with a mixture of 120 mg of condelcortone and 1000,000 i.u. Penicillin G. Sodium, followed by a pressure bandage. Complete rest of these animals in a stable with soft bedding was offered.

In cows suffering from septic tibiotarsal arthritis, the synovial effusion was aspirated then flushed with normal saline solution. Intra-articular injection with a combination of 1 gm. streptomycin + 1000,000 i.u. Penicillin G-Sodium in the antromedial and lateral synovial sacs and a pressure bandage was done daily for 5 successive days. Systemic course of 160 mg. Gentamycin (as sulphate) was deeply intramuscularly injected for 3 successive days.

In the case affected with chronic deformed arthritis at the right hock region, the area was subjected to radiological diagnosis. The applied exposure factors were 80 mA. 100 KV and 0.15 sec. in a lateral and oblique-latero-medial planes.

RESULTS

During this study three different types of arthritis were found at the tibiotarsal articulation. These forms were: Traumatic hydrarthrosis (9), septic arthritis (2) and degenerative arthritis in a dairy cow.

In traumatic hydrarthrosis, the clinical observation showed presence of well marked enlargement involving the anteromedial pouch of the joint capsule of the affected tibiotarsal articulation. This enlargement was unilateral in all cases except one case which exhibited a bilateral involvemtnt (Fig. 1). The unilateral affection was mostly diagnosed on the left limb (Fig. 2) and only one case was observed at the right side (Fig. 3). In two cases, severe enlargement was observed at the anteromedial pouch and the lateral aspect of the affected hock region till the lateral malleolus of the tibia. Digital pressure on the enlarged pouch did not result in distribution

of the extrasynovial effusion to another synovial sacs and the posterior aspect of the hock region appeared normal. Signs of lameness could not be detected either in unilateral or bilateral involvement.

The physical properties as well as the mucin clot quality of the extra-synovial effusion were studied (see the table).

The recommended treatment gave good and rapid recovery in all affected calves (Fig. 4).

In septic arthritis, the affected joint showed diffuse enlargement involving the anteromedial pouch, the lateral aspect of the joint then extended to involve the synovial sheath of the tendons on the latero-posterior aspect of the proximal third of the metatarsal region, beside the distal part of the Achillis tendon (Fig. 5). The animal was unable to bear weight on the affected limb and rested it on the toe of their claws. Also flexion of all joints especially, those of the phalangeal regionwas noticed (Fig. 6). The corresponding sound limb carried most of the body weight and was directed in a backward position. On manual movement a frictional sound could be heard and local hotness was felt. The physical characters and the mucin clot quality were tabulated (see the table).

The applied trials for treatment gave slight improvement however, moderate degree of lameness was still present. Complete disappearance of the inflammatory signs was noticed.

The cow with degenerative arthritis exhibited detectable degree of lameness and examination of the effected joint revealed presence of a limited movement. Radiological diagnosis refered to severe periosteal reaction at the articular surfaces of the tibiotarsal and proximal intertarsal joints (Fig. 7a, b). Also degenerative and periosteal reactions were seen on the medial aspect of the affected joint (Fig. 7,c). The distal intertarsal joint, showed narrowing of the joint cavity (Fig. 7,d).

The following table shows the physical properties and mucin clot quality of the synovial effusion in traumatic and septic arthritis at the tibiotarsal articulation in cattle.

Properties	Traumatic hydroarthrosis	Septic arthritis
Colour	Yellow	White
Volume	30-50 ml.	40-50 ml.
Odour	Absent	Absent
Gross appearance and clotting ability at room tempreature.	Clear fluid which does not clot.	Turbid fluid with flacculent materia' and ability to clot.
Gross appearance after refrigeration	Showed flacculent ropy mass in a clear fluid	Resembled a solid melted wax.
Mucin clot	Good in (7) to fair in (2) cases with formation of clear clump.	Very poor with flacculent particles.

DISCUSSION

It is worthy to mention that, the affection of the tibiotarsal articulation is not a popular one in cattle however, care must be paid to avoid pathological changes destroying their articular surfaces.

It has been found that, exposure of the tibiotarsal articulation to traumatic hydrarthrosis in heavy beef calves may be due to the improper management offered to those animals kept raised on hard bedding. Therefore, presence of a good, even soft bedding should be provided to guard against such affection.

Quite clear, the mucin clot quality is of value for the determination of the sequelle of the adopted treatment. It is obvious that traumatic hydrarthrosis of good muciun clot is apt for good recovery due to the ability of the synovial cells to synthesize adequate amount of hyaluronic acid in a highly polymerized state, a fact which is similar to the findings of VAN PELT (1963), VAN PELT & LANGHAM (1968) and BOLBOL (1975). On the other hand septic arthritis in dairy cows showed slow improvement. This is simply due to the decrease of deploymerization to the produced hyaluronic acid and denaturation of the mucin as the result of bacterial toxins. This result is in accordance with that mentioned by CORNELIUS and KANEKO (1963).

Our clinical observation revealed that hydrarthrosis of the hock joint in cattle is not similar to that of equines (Bog pavin) and only the anteromedial pouch of the joint capsule is enlarged but in septic hydrarthosis the synovial sheath at the latero-posterior aspect is also enlarged resulting in a severe degree of lameness. This could be supported by the work of VAN PELT and LANGHAM (1968).

As regards the radiological findings in case of degenerative arthritis, the bony formation lipping over both the tibiotarsal and proximal intertarsal joints could be attributed to the presence of communication between these joints at the planter and lateral aspects of the tibiotarsal bone (GETTY, 1975).

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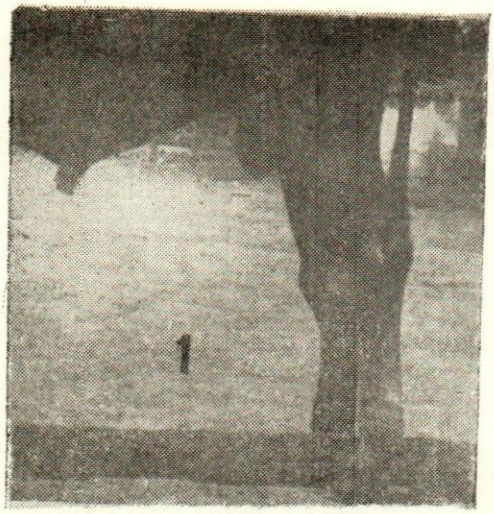
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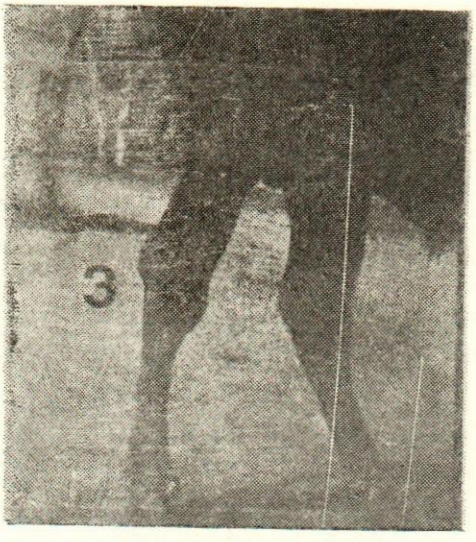
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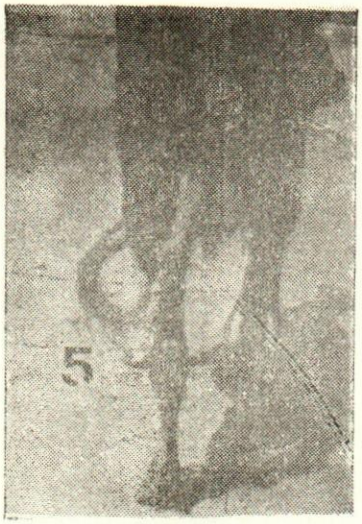
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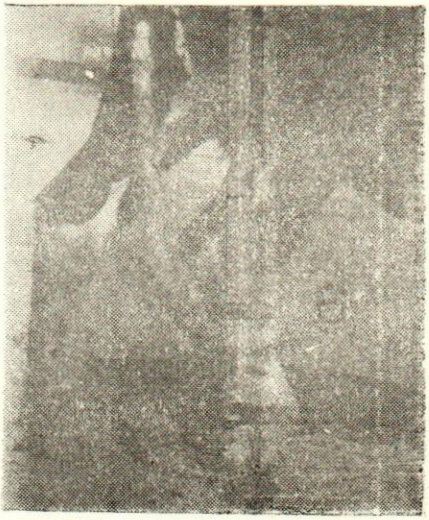

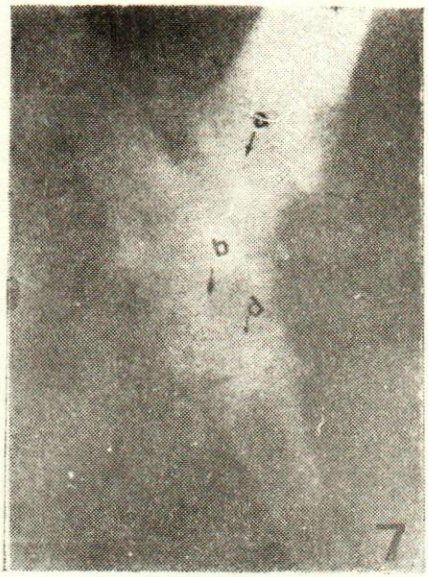
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LEUGEN OF FIGURES

Fig. (1): Showing bilateral Traumatic hydrarthrosis of the tibiotarsal articulation.

Fig. (2): Showing unilateral Traumatic hydrathrosis of the left tibiotarsal articulation.

Fig. (3): Showing unilateral traumatic hydrarthrosis of the right tibiotarsal articulation.

Fig. (4): Showing the case in Fig. 2 after recovery.

Fig. (5): Showing a dairy cow suffering from septic arthritis of the tibiotarsal articulation (posterior view).

Fig. (6): Showing the attitude of the limb affected with severe septic arthritis in a dairy cow.

Fig. (7): Oblique latero-medial view of the right hock of a dairy cow affected with chronic deformed arthritis. Ankylosis of the tibiotarsal and proximal intertarsal joint (a,b), periosteal reaction at the medial aspect of the joint (c) and narrowing of the distal intertarsal joint (d).