

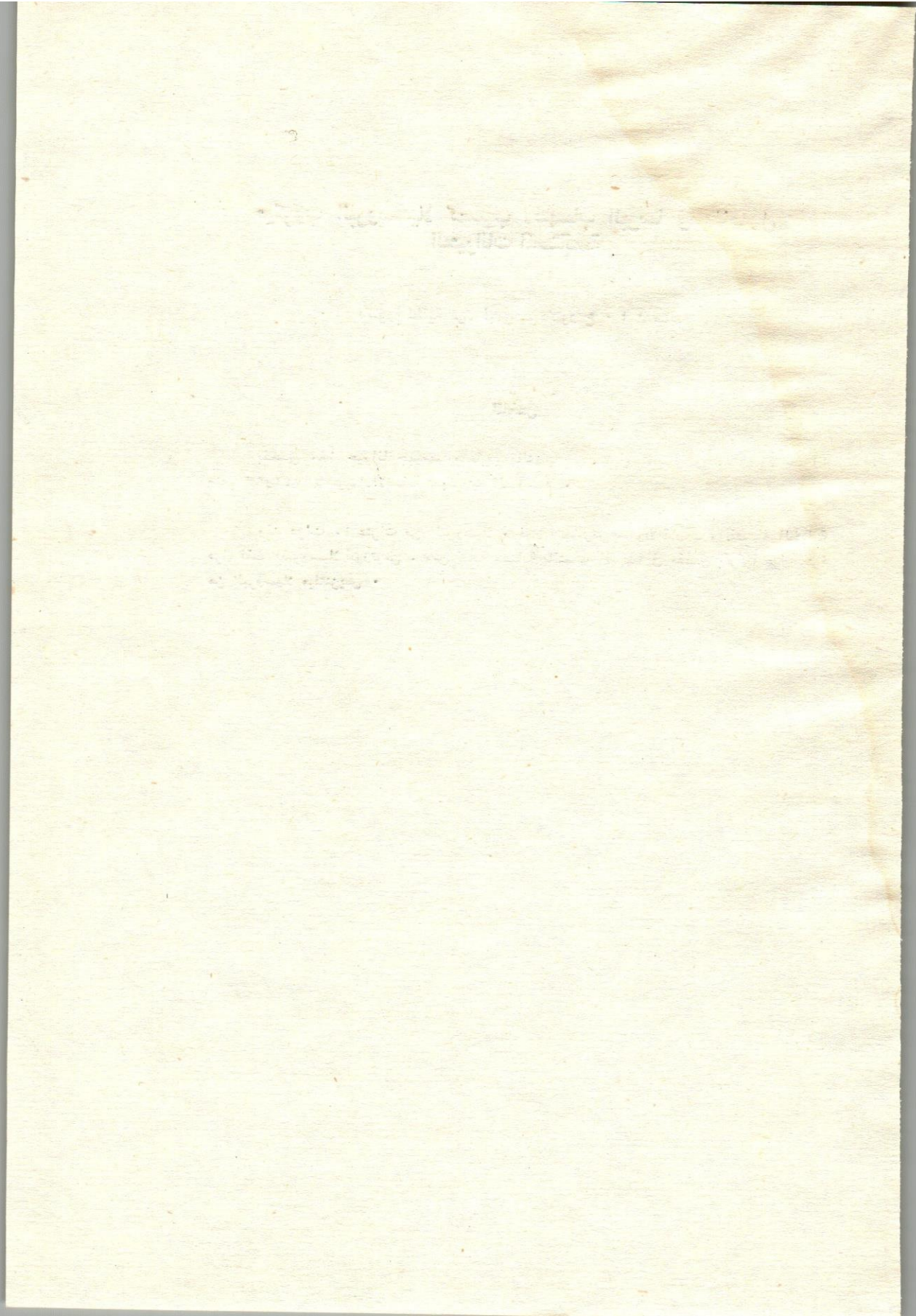
## ميكروب البروسيلا كمسبب لالتهاب البرسا في مفاصل الحيوانات المستأنسة

دكتورة لطيفة س. فهمى - دكتور ع ٠ ١٠ سالم

### الملخص

بفحص ١٨٠ حيوانا جميعهم مصابين بالتهاب البرسا في المفصل وجد أن ٧٦ حيوانا منهم (٤٢٢٪) سببها الإصابة بميكروب البروسيلا .

وقد عزلت ١٠ عترات من البروسيلا . فمن الجاموس - والأبقار - والفصيلة الخيلية عزل فقط البروسيلا أبووتوس . ومن نعجة مصابة بالتهاب البرسا في مفصل الركبة عزل عترة من البروسيلا ميلتنزيس .



Department of Surgery and Dept. of Veterinary Medicine, Faculty  
of Veterinary Medicine, Cairo University.

Head of Surgery Section : Prof. Dr. K. Fouad

## BRUCELLA AS A CAUSE OF BURSTITIS IN DOMESTIC ANIMALS

(With 3 tables and one Figure)

By

L.S. Fahmy and A.A. Salem

(Received at 1 - 4 - 1974)

### SUMMARY

Examination of 180 animals suffering from different forms of bursitis revealed that 76 cases (42.2%) were due to brucella infection.

From the affected cases 10 brucella strains were isolated. Only *Brucella abortus* biotypes 1, 3 and 6 were isolated from buffaloes cattle and equines. *Brucella melitensis* biotype 1 was recovered from a sheep suffering from capped knee.

### INTRODUCTION

DUFF (1936/37), HUTYRA, MAREK and MANNINGER (1938), MILLER (1961), Van Der HOEDEN (1964) and McCAUGHEY and KERR (1967) reported cases of fistulous withers and poll evil in horses due to *Brucella abortus* infection.

DIMITRIEV (1951), GOTZE and WAGNER (1954), DIETZ (1959/60) reported that brucellosis infected cattle are mostly affected with bursitis, hygromas and arthritis beside the clinical manifestation of abortion, retention of placenta and metritis.

FECHNER and MEYER (1960) housed four horses with brucellosis infected cows and found that two of the horses developed fistulous withers.

Van Der HOEDEN (1960) and COSGROVE (1961) recorded that brucellosis in equines can produce lameness due to inflammation of bursae and tendon sheaths.

HUTCHINS and LEPHERD (1968) found that serum of 74% of animals suffered from fistulous withers and 5.3% of lame horses contained brucella agglutinins.

BALBO, NOBILI and GUERCIO (1969) recovered *Br. abortus* from the contents of hygromas from five infected cows, and suggested that in infected or suspected herds, the presence of hygromas may be taken as evidence of brucellosis.

OGASSAWARA, CURY, D'APICA, MACHADO and ROCHA (1967) isolated *Br. abortus* biotype 3 from carpal hygroma in a buffalo.

COLLINS and FARRELLY (1971) reported cases of osteoarthritis, fistulous withers and fore limb stiffness due to *Br. abortus* infection in equines.

DENNY (1972) recovered *Br. abortus* from the joints of infected horses and reported 83% of horses suffering from navicular disease have positive brucella titre in their blood sera.

Some cases of bursitis received in our clinic were resistant to the traditional treatment with corticosteroides and antibiotics. Therefore the present study was carried out to investigate the possibility of brucella organisms as an etiological factor of bursitis in domestic animals in Egypt.

#### MATERIALS AND METHODS

The present investigation was carried out on 180 animals of different species, ages and sex. All these animals were suffering from different kinds of bursitis and synovitis as shown in table 1. These animals were subjected to clinical and laboratory examinations.

##### *Laboratory Examination :*

- (a) Blood was collected from the jugular vein, serum was separated and subjected to the following serological tests :
  1. The slide Agglutination test (SAT) : HUDDLESON (1932).
  2. The Tube Agglutination test (TAT) : ALTON and JONES (1967).
  3. The Complement Fixation test (CFT) : adopted by TRILENKO (1956) in which titration of the complement was carried out in the presence of the antigen and the haemolytic system.
- (b) For bacteriological examination, 38 samples were collected from the contents of the bursae and synovial sheaths of serologically positive animals. Each sample was subjected to cultural method and guinea pig inoculation for isolation of brucella organisms.

TABLE 1 : Forms of bursitis in different animals

Affections	Buffaloes	Cattle	Equines	Sheep & goats	Total
Capped knee . . . . .	7	3	41	2	53
Collar bursitis . . . . .	—	—	23	—	23
Supraspinous bursitis . . . . .	2	18	8	—	28
Fistulous withers . . . . .	—	—	26	—	26
Capped elbow . . . . .	16	—	8	—	24
Bog spavin . . . . .	—	—	13	—	13
Presternal bursitis . . . . .	9	—	—	—	9
Capped hock . . . . .	1	1	1	—	3
Arthritis . . . . .	—	—	—	1	1
Total . . . . .	35	22	120	3	180

*Cultural Method* : Using the meat-liver infusion media to which 2% glycerol, 1% glucose, 1% peptone and 0.5% sodium chloride were added with pH 6.8-7.2 Cultures were incubated at 37°C under 5-10% CO<sub>2</sub> tension as well as under normal atmospheric condition.

*Animal Inoculation* : Two brucella free guinea pigs were used for each sample. Agglutination test was carried out on the sera of inoculated animals 2 weeks after inoculation. One of these guinea pigs was killed 4 weeks, while the second animal was killed 6 weeks after inoculation. Before killing, blood was also taken for serological examination. At autopsy lesions were noticed and cultures were made from lymph nodes, bone marrow and visceral organs. Suspected brucella colonies were confirmed by microscopical examination of stained smears and agglutination with anti-brucella positive serum.

Typing of the isolated brucella strains was carried out according to the methods recommended by the Committee of Taxonomy of Brucella and combined Committee of FAO/WHO for differentiation of Brucella microorganisms, 1967. Before typing, the isolates were proved to be in smooth form by using the methods of BRAUN and BONESTELL (1947), WHITE and WILSON (1952) and the thermo-precipitation test.

## RESULTS

The results of the clinical examination of 180 animals showing different forms of bursitis are shown in Table 1.

The results of serological investigation are summarized in Table 2. From table 2 it is clear that 76 cases out of the examined 180 animals were serologically positive to brucella infection. The positive cases included 16 buffaloes, 10 cattle, 20 horses, 29 donkeys and one sheep. This sheep was suffering from capped knee (Fig. I "7") and *Br. melitensis* biotype 1 was recovered from the lesion (Table 3).

The results of bacteriological examination of 38 animals which reacted positively to the serological tests are given in Table 3.

## DISCUSSION

Studies on brucellosis as a cause of bursitis in different species of animals received little attention, specially in Egypt. Some cases of bursitis which failed to the response of the traditional treatment with corticosteroides and antibiotics gave us the impression to study the possibility of brucella organisms as a cause of such cases.

In this work serological investigation of 180 animals suffering from different forms of bursitis, revealed that 76 animals (42.2%) reacted positively to one or more of the serological tests namely the slide agglutination, tube agglutination, and complement fixation tests for diagnosis of brucellosis.

In the present investigation out of the examined 35 buffaloes 16 cases (45.7) were due to brucellosis. Three brucella strains were isolated from buffaloes suffering from capped knee, sternal bursitis (Fig. 1 "1") and capped elbow (Fig. I "2"). The isolated brucella strains were typed as *Br. abortus* biotypes 1 & 3 (Table 3). These results are supported by SARISAYIN, EROGLU and NADAS (1968) and OGASSAWARA *et al.* (1969).

Cases of lumber bursitis due to brucellosis in buffaloes were also reported in our work (Fig. 1 "3").

TABLE 2 : Brucellosis in animals suffering from bursitis

Species	No. of animals examined	No. of animals infected
Buffalo . . . . .	35	16
Cattle . . . . .	22	10
Horse . . . . .	54	20
Donkey . . . . .	63	29
Mule . . . . .	3	—
Sheep . . . . .	1	1
Goat . . . . .	2	—
Total . . . . .	180	76 (42.2%)

TABLE 3 : Brucella strain isolated from animals suffering from bursitis

Animal Species	SAT	Titre of TAT	CFT	Lesion	Typing of the iso lates
1. Buffalo . . . . .	+	1 : 160	+	Capped knee . . . . .	Br. abortus biotype 1.
2. Buffalo . . . . .	+	1 : 160	+	Sternal bursitis . . . . .	Br. abortus biotype 3.
3. Buffalo . . . . .	+	1 : 80	+	Capped elbow . . . . .	Br. abortus biotype 3.
4. Ox . . . . .	+	1 : 80	+	Supraspinous bursitis . . . . .	Br. abortus biotype 1.
5. Horse . . . . .	+	1 : 80	+	Capped elbow . . . . .	Br. abortus biotype 3.
6. Mare . . . . .	+	1 : 640	+	Capped knee . . . . .	Br. abortus biotype 3.
7. Mare . . . . .	+	1 : 320	+	Bog spavin . . . . .	Br. abortus biotype 3.
8. Mare . . . . .	+	1 : 80	+	Collar bursitis . . . . .	Br. abortus biotype 6.
9. Donkey . . . . .	+	1 : 320	+	Fistulous withers . . . . .	Br. abortus biotype 1.
10. Sheep . . . . .	+	1 : 80	+	Capped knee . . . . .	Br. melitensis biotype 1.

SAT = Slide agglutination test.

TAT = Tube agglutination test.

CFT = Complement fixation test.

Out of the examined 22 cattle, 10 cases (45.6%) were due to brucellosis (Table 2). One strain of *Br. abortus* biotype 1 was recovered from a case of supraspinous bursitis (Fig. 1 "4"). These findings are supported by DEMETRIEV (1951), BALBO *et al.* (1969) and others. During this investigation it was noticed that cases of supraspinous bursitis were much higher in cattle than the other forms of bursitis (Table 1). This may be due to the fact, **that these animals are still used for work such as ploughing the land in our country.** This work may lower the resistance of the supraspinous area and act as a predisposing cause for brucella organisms to set up pathological lesions in this part of the animal body.

The results obtained from this study on buffaloes and cattle clearly demonstrated that brucella organisms are responsible for abortion, retention of the placenta as well as various forms of bursitis.

In this investigation 54 horses and 63 donkeys were suffering from bursitis, out of them 20 horses (37.0%) and 29 donkeys (46.0%) were due to brucellosis (Table 2). It was found that equines between 4-9 years of age are mostly infected. This fact is supported by DENNY (1972). Five brucella strains were isolated from equines suffering from capped elbow, capped knee (Fig. 1 "5"), bog spavin, collar bursitis and fistulous withers (Fig. 1 "6"). These strains were typed as *Br. abortus* biotypes 1, 3 and 6 (Table 3), in addition to this it was noticed that equines with a history of contact with infected cattle are mostly infected. This indicates that brucellosis infected cattle are considered as a main source for equine infection. These findings are supported by DUFF (1936/37), HATYRA *et al.* (1938), MILLER (1961), Van Der HOEDEN (1964), COSGROVE (1961), McCaughey and KERR (1967), HUTCHINS and LEPHERED (1968) COLLINS and FERRELLY (1971) and DENNY (1972).

During this investigation the traditional treatment of the different forms of bursitis due to brucellosis by using cortizone and penicillin was of no value. Therefore animals suffering from bursitis should be examined for brucellosis before treatment.

The results of the present investigation indicated that animals suffering from bursitis should be handled with caution unless proved brucella free by serological tests.



## REFERENCES

- Alton, G.O. and Jones, L.N. (1967) : Laboratory techniques in brucellosis. *Wld. Hlth. Org. Tech. Report Ser.*, **55** : 9.
- Bablo, S.M. ; Nobili, I and Guercio, V. (1969) : Hygromas in cattle infected with *Brucella abortus* : Their importance in the diagnosis of the disease. *Vet. Ital.*, **20** : 716 - 720.
- Braun, N. and Bonestell, A.E. (1947) : Independent variation of characteristics of *Br. abortus* variants and their detection. *Amer. J. Vet. Res.* **8** : 380.
- Collins J.D. and Farrelly (1971) : *Brucella* associated vertebral osteomyelitis in a Thorough bred mare. *Vet. Rec.*, **88** : 321 - 326.
- Corcoran, C.J. (1966) : Isolation of *Brucella abortus* from a case of atlantal bursitis in the horse. *Irish. Vet. J.* **20** : 8 - 10.
- Cosgrove, J.S.M. (1961) : Clinical aspects of equine brucellosis. *Vet. Rec.* **73** : 1377-1382
- Dimitriev, A.I. (1951) : Morphological changes in cattle during active form of brucellosis. *Sbornic Trod. Lening. Hoochno-Issled. Vet. Inst.* 1951, *Vibosk*, **4** : 51.
- Dietz, O. (1959) : Die lokal-antibiotische Behandlung der Bang-Synovitiden des Rindes und der infizierten Synevitiden des Pferdes mit Nebacetin und Hydrocortison. *Tierarztl. Umschau*, **14** : 274 - 278.
- Dietz, O. (1960) : Durch *Brucella*-infektionen hervorgerufen Chimigische Erkrankungen bei Pferd, Rind, Schaf und bei der Katze. *Mhft. Vet. Med.*, **15** : 752 - 755.
- Duff, H.M. (1936) : Fistulous withers and Poll-evil due to *Brucella abortus*. *Vet. Rec.*, **16** : 175 - 181.
- Duff, H.M. (1937) : *Brucella abortus* in the horse. *J. Comp. Path.*, **50** : 151 - 158.
- Denny H.R. (1972) : Brucellosis in the horse. *Vet. Rec.* **90** : 88 - 91.
- Gotze R. and Wagner H. (1954) : Vorschlage und Wege zur Bekämpfung des Abortus (Bang) des Rindes. Schaper Verlag, Hannover.
- Fechter J. and Meyer, W. (1960) : Brucellosis in horses. *Arch. Exp. Vet. Med.*, **14** : (1), 327
- Huddleson, I.F. (1932) : *Mich. Agr. Exp. St. Tech. Bull.* 123. Cited in Hagan, W.A. and Lerner, D.V. (1961) *B : The infectious diseases of domestic animals.* 4th ed., p., 276, New York.
- Hutyra, F., Marek, J. and Manninger, R. (1938) : Special pathology and therapeutics of the diseases of domestic animals. 4th ed. 1, London, Bailliére, Tindall & Cassell.
- Hutchins, D.R. and Lephord, E.E. (1968) : The occurrence of agglutinins to *Brucella abortus* in horses. *Aust. Vet. J.*, **44** : 323.
- McCaughy, W.J. and Kerr, W.R. (1967) : The Coomb's or antiglobulin test in the horse. *Vet. Rec.*, **81** : 542.
- Miller, R. (1961) : Diseases of the ligamentum nuchae associated with *Brucella abortus* infection in the horse and its treatment with strain 19. *Br. Vet. J.*, **117** : (4), 167.
- Ogassawara, S., Cury, R., D. Apica, V.B., Machado M.M. Def. and Rocha, U.T. (1969) Carpal hygroma from *Brucella abortus* infection in a buffalo, *Bos bubalis*. *Arq. Ins. Biol. S. Paulo*, **36** : 117 - 121.

- Portugal, M.A., Nesti, A., Giorgi, W., Franca, E.W., Oliveira, B.S. (1971) : Brucellosis in horses caused by *Brucella suis*. *Afq. Inst. Biol. S. Paulo*, **18** (3) : 125.
- Sarisayin, F., Eroglu M. and Nadas, U.G. (1968) : Brucellosis species and biotypes isolated in Turkey. *Pindik Vet. Koutrol, Ara, Enst. Derg.*, **1** : (2) 24-35.
- Trilenko, P.A. (1956) : Diagnosis of infectious abortus. 2nd ed., p. 75 - 116, Silkhodziz., Moscow, USSR.
- Van Der Hoeden, J. (1960) : Zoonoses, p.103. Amsterdam Elsevier Publishing Company.
- White, P.O. and Wilson, J.B. (1951) : Differentiation of smooth and non-smooth colonies of *Brucella*. *J. Bact.*, **61** : 239.

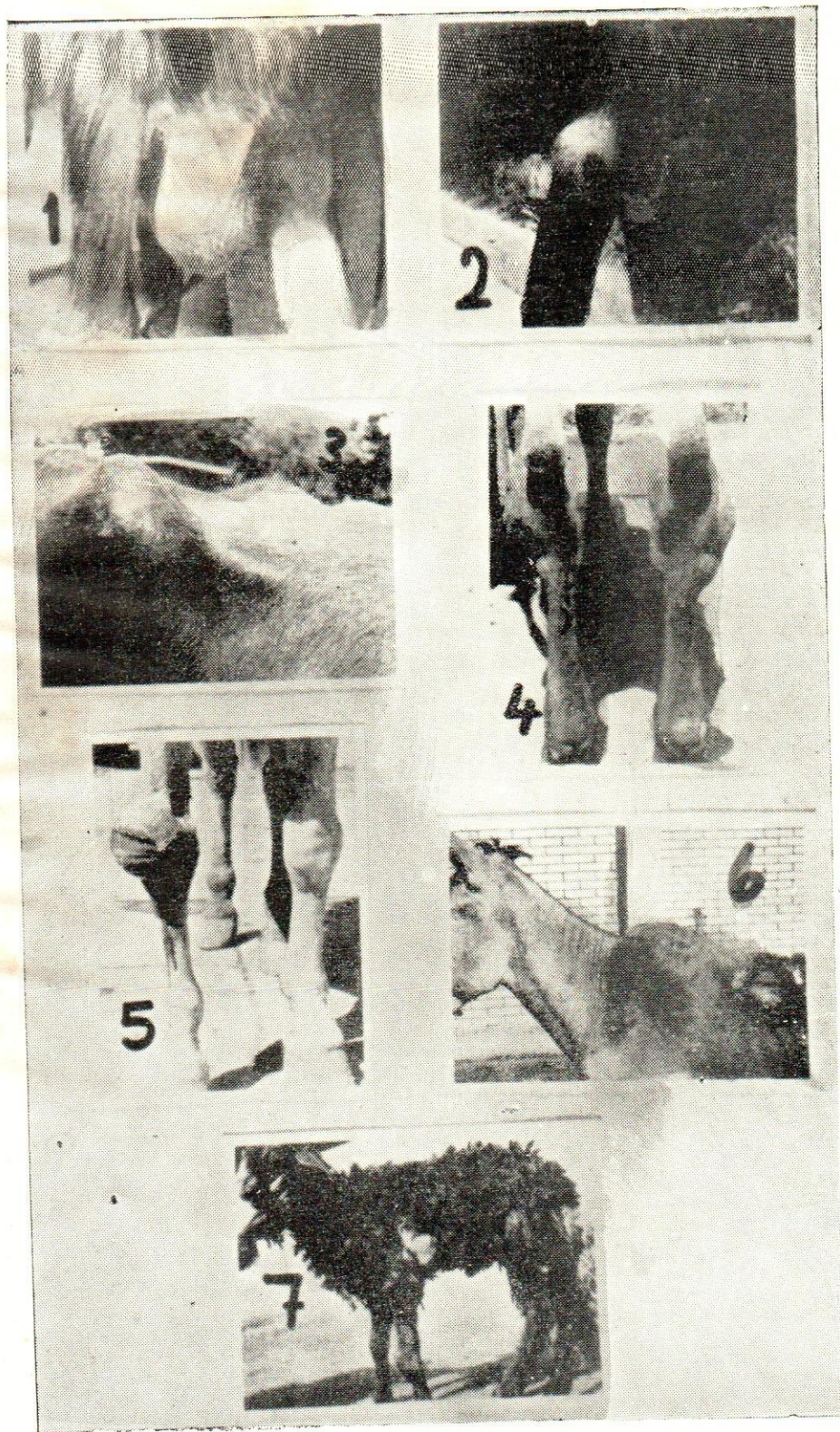


Fig. 1.—Animals suffering from different forms of bursitis due to brucella infection.

