

PREVALENT SURGICAL AFFECTIONS OF THE METACARPUS,  
METATARSUS AND PHALANGES IN EQUINES  
IN UPPER EGYPT

(With 2 Tables & 9 Fig.)

By

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الإصابات الجراحية الشائعة لمنطقة المشط الإمامي  
والخلفي والسلاميات في الفصيلة الخيلية  
في مصر العليا

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أجرى هذا العمل على ٤٤١ حيواناً من الفصيلة الخيلية منهم ٣٧١ حمار و ٤٥ حصاناً و ٢٥ بغلاً من كلا الجنسين ومصابين جراحياً في مناطق العظمه المشطيه الكبرى والسلاميات .  
أظهرت النتائج ان أكثر الحيوانات اصابه هى الحمير يليها الخيول ثم البغال وكانت الإصابه منتشره فى القوائم الاماميه عنها فى القوائم الخلفيه. ولوحظ أن التهاب الوتر المزمن وكذلك التهاب غمد الوتر القابض كانت أعلى نسبة من أى إصابه أخرى حيث بلغت ٦٨% ولوحظ ان الوتر الغائر هو أكثر إصابه من أى وتر آخر . كما أن التهاب الوتر المنتشر كان أكثر شيوعاً من الالتهاب المحدد بمكان .  
لوحظت الكسور بنسبة ٦% فى منطقة المشط و ٨ ر ٥% فى السلاميات وكذلك تفاعلات عظميه سمحاقية عظميه بنسبة ٢ ر ١١% .  
وكانت تمثل إصابات المفاصل بنسبة ١٨% وكذلك نسبة الجروح كانت تمثل ٢ ر ٥% أما بالنسبه لقصر الاوتار القابضه كانت ٨ ر ١% وكذلك كسور السمسمانيات العلويه كانت نسبتها ٢ ر ٠% .

\*: Part of Ph.D Thesis presented by M.A. SEMIKA.

### SUMMARY

The present study was carried out on 441 animals of equine species (371 donkey, 45 horses and 25 mule) of both sexes showing surgical affections in the metacarpus, metatarsus and phalanges. The results obtained from the present study were: Donkeys were met with in a high number, followed by horses and mules. The affections were more common in the thoracic limbs than in the pelvic limbs. Chronic tendinitis and tendovaginitis of the flexor tendons were met with in a high percentage than the other types of affections (68%). All cases of tendovaginitis were recorded in combination with tendinitis. Deep digital flexor tendon was the most common seat for tendinitis than superficial digital flexor tendon and suspensory ligament. Diffuse tendinitis was more common than localized one. Fractures of metacarpal and metatarsal bones were recorded in a percentage of 6%. Fractures of phalangeas were recorded in a percentage of 5.8%. Osteoperiosteal reactions (ring bone and splints) were recorded in a percentage of 11.2%. Joint affections alone were recorded in a percentage of 1.8%. Wounds of metacarpus, metatarsus and phalangeal region were recorded in a percentage of 5.2%. Shortening of the flexor tendons and fractures of the proximal sesamoid bones were recorded in a percentage of (1.8%) and (0.2%) respectively.

### INTRODUCTION

Tendovaginitis and tendinitis were observed in three areas, high (just below the carpus), middle (in the middle third of metacarpal or metatarsal region) and low (in the distal third of the metacarpal or metatarsal region). Severe strain to the flexor tendon is more common in the thoracic limb (EL-EMARY, HYTALANY and ASAAD 1990).

EL-KEIEY (1979) indicated that chronic tendinitis and tendovaginitis were more common in the fore limbs than in the hind limbs. Diffuse tendinitis were more common than localized tendinitis. Inflammation of suspensory ligament was in relation to the superficial digital flexor tendon, while that of the deep digital was mostly met with alone.

BONE, GABEL, JOHNOSON and RILEY (1972) stated that splitting technique can be used only in chronic cases of damaged tendon. Treatment regimes for tendon injury vary from long tendon established procedures such as thermocautery to more recently developed surgical intervention including tendon splitting and tendon graft.

Damaged or severed flexor tendon have been treated by suturing, tendon extention and suturing, injection with corticosteroid or sclerosing agents, and tendon grafting all with varying degree of success (VALDEZ, CLARK and HANSELKA 1980).

HAGO and VAUGHAN (1986) recorded that tendon sheaths are subjected to acute and chronic forms of inflammation producing condition which have long been recognised in clinical practice. The same authors indicated that inflammation of the tendon sheaths occur commonly in horses. Trauma, infection and strain of a closely associated structure as tendon, are the most likely aetiological factors. The clinical features which may result are fluid distention, tissue thickening, localized pain, reduced function of the adjacent joint and varying degree of lameness. Palpation will reveal fluid distention, tissue thickening, heat and pain.

EL-EMARY *et al* (1990) stated that affection of the flexor tendons and tendon sheaths occupy the most prevalent affections in the limbs. Radiographic examination of the flexor tendons in case of chronic tendinitis sometimes show calcification or ossification within the tendon (WILLIAMS and CAMPBEL 1961, VANPELT 1969).

Dyson (1991) reported that radiographic abnormalitis of the proximal suspensory desmitis include sclerosis of the trabiculae, change in orientation of the trabiculae and enthesophyte formation.

SHOEMAKER, BERONE, MOHAMMAD and ARMS (1991) reported that proximal accessory has been performed as a treatment for flexural defomities of the metacarpophalangeal joint in young horses and superficial digital flexor tendinitis in race horses.

Fractures of a splint bone may involve either the second or fourth metacarpal or metatarsal bones. Fractures is most common on the second metacarpal as a result of opposite foot striking the bone. Fracture of fourth metacarpal or metatarsal bone is less common. Fractures of splint bone causes lameness that becomes more marked upon exercise and is most noticeable at a trot, swelling over the affected splint bone, heat and pain. Radiographs are necessary to positive diagnosis of

fractured splint bone. Treatment of the fractured splint bone is the removal of the distal bone fragment (ADAMS 1974).

COLLIER, RENDANO and KALLFELZ (1985) stated that stress fractures of dorsal or dorsolateral cortex of third metacarpal bone are frequently seen in thoroughbreds actively racing or in training. The syndrome may be related to persistent cumulative microfractures and metacarpal cortical hyperplasia that frequently occur in young horses in training. Chip fractures of the proximal end of the first phalanx are relatively common in the fore limb of the horse. The medial side is affected more often than the lateral side. Trauma is the cause of these chip fractures of the first phalanx in the horse. Surgical removal of bone fragment is the only successful treatment (ADAMS 1974).

EL-GUINDY (1990) stated that fracture of the first phalanx occurs in riding, galloping, race and working horses. Fracture of the first phalanx is more common in the fore limb than in the hind limb.

MARTIN, NUNAMAKER, EVANS, ORSINI and PALMER (1991) stated that fractures of the proximal sesamoid bones are common injuries in race horses. Fracture types include apical, mid-body, basilar, abaxial and sagittal. The radiographs are essential for diagnosis of the fracture type and location.

ADAMS (1974) defined ring bone as new bone growth that occur on the first, second or third phalanx. It is the result of periostitis and may lead to an osteoarthritis or ankylosis of the pastern or coffin joint.

EL-GUINDY (1990) stated that ring bone is more common in the fore limb than in the hind limb. Ring bone is classified into true ring bone or false ring bone. It is also classified into articular and periarticular ring bone.

MISK and HEFNY (1992) stated that splint in donkeys is represented by postmetacarpal splint, intermetacarpal splint, knee splint and deep splint. The most common type of splints encountered in donkeys was the postmetacarpal splint which is always present at the middle third of the second metacarpal bone. The second type of splint which is more or less common in donkeys was the intermetacarpal splint. Deep and knee splints were rarely observed in donkeys. Splint usually affect the second metacarpal bone and rarely affect the fourth metacarpal bone. This may be due to greater compression load on the medial side of the limb together with the anatomical articular pattern of the second metacarpal with the carpal bones. Also sprain of the intermetacarpal and suspensory ligaments may be an actual cause for intermetacarpal and deep splints respectively.

Arthritis can be defined as inflammation of a joint. This inflammation may involve many or all components of a joint including the bone forming the joint, the articular cartilages, the joint capsule and the associated ligaments. Enlargement of a joint can be the result of several causes, either singly or in any combination, which include: enlargement of the bones forming the joint, thickening of the joint capsule, distention of the joint capsule with synovia or other fluid and swelling of the periarticular tissues (ADAMS 1974).

EL-GUINDY (1990) stated that inflammation of the fetlock joint include three forms represented by acute, chronic and septic arthritis. Chronic deformed arthritis is occasionally met with in old horses as the result of constant hard work.

DYSON (1991) suggested that the majority of horses with osteoarthritis of the distal interphalangeal joint has some palpable swelling of the distal dorsal aspect of the pastern and a tendency for hair along the dorsal aspect of the coronary band to stand erect.

TURNER (1984) stated that luxation of the fetlock in horses and cattle is probably the most common of this type of injury. Fetlock luxation may be open or closed. Radiograph should be taken for diagnosis.

SHIROMA, ENGEL, WAGNER and WATROUS (1989) reported that dorsal subluxation of the proximal interphalangeal joint in the pelvic limb is a rare disorder in young horses with straight legs. The condition usually occurs bilaterally. Dorsal subluxation of the pastern joint can be a cause of lameness, the severity of the lameness is inconstant. Dorsal subluxation of the pastern joint of the pelvic limb may represent a form of deep digital flexor tendon contracture. Radiography was done to evaluate the alignment of the phalanges. The proximal interphalangeal joint was slightly flexed dorsally in a subluxated pastern. A dorsal subluxation of the pastern joint may occur with transection of the suspensory ligament or due to trauma.

EL-GUINDY (1990) mentioned that luxation of the hoof joint is very rare. It may occur as a result of an accident and is usually associated with fracture of os pedis or the second phalanx.

JONES (1986) stated that when the wounds of the phalangeal region are left untreated or not adequately bandaged hypergranulation tissue may develop.

MARKEL, RICHARDSON, PETERSON and MEAGHER (1987) stated that avulsion injuries of the coronary band may result in permanent hoof wall defects or spurs in the horse. Coronary band avulsions frequently damage the coronary corium and

disturb the germinal cells that form the hoof wall, which results in these hoof wall abnormalities.

EL-GUINDY (1990) stated that deep wounds on the metatarsus are of common occurrence. They are in the form of transverse or longitudinal wounds. When the periostium is reached, purulent periostitis, ostitis and osteomyelitis may occur. Necrosis of the tendon may occur as the result of deep wounds. In these cases a large amount of granulation tissue is formed whose surface is not covered with epithelium. The same author indicated that the animal affected with coronary phlegmon shows diffuse inflammatory swelling around the coronet. This swelling is hot, painful and sometimes fluctuating on some parts. The pulsation of the metatarsal arteries is strong. In majority of cases several abscesses are found, necrosis of the skin at the coronet or necrosis of the extensor tendon may take place. Extension of inflammation may cause purulent arthritis of the hoof joint.

The aim of the present study is to evaluate the percentage of some affections and their predeliction seat on the metacarpus, metatarsus or phalanges, metatarsus or phalanges, and to reach to correct diagnosis as well as differential diagnosis.

#### MATERIAL and METHODS

The present study was carried out on 441 animals from equine species (371 donkeys, 45 horses and 25 mule) of both sexes. The affections of metacarpus, metatarsus and phalanges were presented in Table (1). These animal were ranging from about one year to over fifteen years old. The animals were gathered from the Veterinary Clinic, Faculty of Veterinary Medicine, Assiut university and from villages of Assiut and Sohage Governorate. The animals were subjected to history, Which includes type of work, duration of the affections, age and previous treatment. Inspection, for detection of swellings, wounds, deformity in the metacarpus, metatarsus and phalanges in addition to degree of lameness in standing position and during movement. Palpation, for detecting the nature of the swelling (fluctuated or hard, movable or not, hot or cold), degree and site of pain and presence or absence of crepitation. Flexion and extension of the phalangeal joints for detection of pain if presernt. Radiological examination was performed for detection of bony changes, location of bony exostosis, ankylosis or luxation of joints, site, direction and number of bone fragments in case of fractures in addition to ossification and calcification of tendons.

## RESULTS

The present study revealed that the prevalent affections of metacarpus, metatarsus and phalanges in equines are represented by chronic tendinitis and tendovaginitis, fractures, osteoperiosteal reactions, wounds, flexural deformity and joint affections (Table 2).

### I-Tendinitis and Tendovaginitis:

In this study a number of 300 animals were affected with chronic tendinitis. From these animals about 79 case (61 donkeys, 10 horses and 8 mules) were affected in addition to tendinitis with tendovaginitis. Tendinitis and tendovaginitis are prevalent affections in the thoracic limb than in the pelvic limb (Fig.,1).

### II-Flexural Deformity:

A number of 8 donkeys (hard working) were met with suffering from flexural deformity due to shortening of the superficial and/or deep digital flexor tendons. Such cases were not met with in horses or mules. This affection was observed in the thoracic limb more than in the pelvic limb (5 cases in the thoracic limbs and 3 cases in the pelvic limbs). This affection varies from slight to severe contraction of the flexor tendons and is diagnosed mainly by inspection. In slight degrees there is upright pastern, in moderate degrees the animals bears weight on the tip of the toe, in severe degrees the animal bears weight on the dorsa wall of the hoof flexing the hoof and pastern joints. Extension of the phalanges is impossible and the tendons appear hard on palpation.

Radiological examination showed slight contraction of the flexor tendons with upright pastern in slight degrees, more contraction of the flexor tendons in the moderate degrees and severe contraction of the flexor tendons with luxation of the interphalangeal joints in severe degrees (Fig.,2).

### III-Fractures:

Fractures were met with in 55 animals (Table 2). They were represented by different types of fractures of the metacarpals, metatarsals, proximal, middle and distal phalanx in addition to fractures of both proximal sesamoid bones.

### Fractures of the Large and Small Metacarpal or Metatarsal Bones:

In the present work 27 animals (20 donkeys, 5 horses and 2 mules) were met with affected with fractures of large and small metacarpal or metatarsal bones (Table, 2). Fractures of the large and small metacarpal bones together were the most common

type of fractures (where the fractures occurs at the proximal third of the bone), this is followed by fracture of large metacarpal bone alone, then fracture of large and small metatarsal bones together. Fracture of the small metacarpal bone alone was rarely observed and was recorded in the second metacarpal bone while fracture of the small metatarsal bone alone was not recorded. In the present study all types of fractures are complete and simple. Different types of fractures were recorded which include single and multiple, diaphyseal and metaphyseal, transverse and oblique fracture. Single and multiple types of fractures were recorded nearly the same in number. Diaphyseal fractures were more common than metaphyseal ones. In cases of single fractures, the transverse type was the most common (Fig., 3).

#### **Fractures of the Phalanges:**

Fractures of phalanges were met with in 26 animals (21 donkeys and 5 horses). Fracture of the proximal phalanx is the most common one followed by fracture of the middle phalanx. Fracture of the distal phalanx was rarely seen in donkeys or in horses. Fractures of the proximal and distal phalanx were more common in the thoracic limbs than in the pelvic limbs while fracture of the middle phalanx was the same in the thoracic limb and the pelvic limb (Figs., 4, 5&6).

#### **Fractures of the proximal sesamoid Bones:**

Fractures of the proximal sesamoid bones were met with in two donkeys only and was not recorded in horses and mules. It is complete, simple, transverse mid-body fracture. The affected animals were hard working and were exposed to external violence. They showed high degree of lameness, swelling on the volar aspect of the fetlock and severe pain on palpation of the sesamoid bones. Crepitation cannot be detected. Radiological examination was essential for diagnosis of proximal sesamoid bones fractures (Fig., 7).

#### **IV-Osteoperiosteal Reactions:**

Osteoperiosteal reactions were met with in 45 animals (Table 2). They include ring bone, splints and ring bone together with splints (Fig., 8).

Ring bone was met with in 31 animals. From these animals 24 (18 donkeys, 5 horses and one mule) were affected with ring bone alone and 7 cases (6 donkeys and one horse) were suffering from both ring bone together with splints. Ring bone was more common in the thoracic limb than in the pelvic limb.



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Splints were met with in 21 animals (18 donkeys and 3 horses). From these animals 14 cases (12 donkeys and 2 horses) were affected with splints alone and 7 cases (6 donkeys and one horse) were affected with splints together with ring bone. Splints were more common to affect metacarpals than metatarsals.

### V-Joint Affections (Fetlock, Pastern and Coffin):

Joint affections were met with in 40 animals (37 donkeys and 3 horses). From these animals 32 cases (29 donkeys and 3 horses) were affected, in combination with joint diseases with shortening of the flexor tendons, fractures of phalanges or ring bone. Affection of joint only were observed in 8 donkeys. It was common affection of the thoracic limbs than the pelvic limbs (Fig., 9).

### VI-Wounds:

From this study it was recorded that 25 animals (15 donkeys, 7 horses and 3 mules) suffered from wounds on metacarpus, metatarsus and phalangeal region were common in the thoracic limb (15 case) than in the pelvic limb (10 case). Phalangeal region was the most common seat for wounds (17 case) than the metacarpus or metatarsus (8 case). Some wounds met with at the metatarsus or metacarpus showed ulcerations, necrosis at the periphery of the wounds, lack of epithelization and pathological hypergranulation tissue. On the other hand, some deep wounds were recorded accompanied by inflammation of the tendon and tendon sheaths with hypergranulation tissue formation. Formation. Sarcoids, coronary phlegmone and accidental wounds with scar tissue were recorded at the phalangeal region.

## DISCUSSION

The result of the present study proved that the high percentage of affections are tendinitis and tendovaginitis which reached about 68% from the affected animals, a result which coincide with those observed by ADAMS (1974) and EL-EMARY et al (1990) who stated that tendon and tendon sheath affection constitute a high percentage of the affections in the limbs.

The deep digital flexor tendon was affected alone in the majority of the cases in the present study. These animals were hard working ones where this tendon is subjected to most of the strain, a phenomenon which is supported by ADAMS (1974), EL-KEIEY (1979) and EL-GUINDY (1981). In this study diffuse tendinitis was more common than localized tendinitis. The same observation was stated by EL-KEIEY (1979).

Localized tendinitis was observed in a low percentage of the presented cases and was situated at the proximal third of the superficial and deep digital flexor tendons (high) or it may be present in the branches of the suspensory ligament (low). This result coincide with the results obtained by *El-EMARY et al* (1990) & *El-GUINDY* (1990).

From the present study, 12% from the affected animals showed different types of fractures including fractures of metacarpal and metatarsal bones (6%), fractures of phalanges (5.3%) and fractures of the proximal sesamoid bones (0.2%). Fractures of metacarpal bones are more common than the metatarsal bones. This may be due to the fact that, the thoracic limb is more exposed to traume and in addition to more stress during work than the pelvic limb. This result coincide with the results of *ALLEN and WHITE* (1987).

In the present study, phalangeal fractures were recorded in percentage of 5.8% from the affected animals. Proximal phalangeal fractures are the most common ones followed by fracture of the middle phalanx. This may be attributed to the anatomical position of the proximal phalanx which subject it to became more exposed to external trauma. The obtained results are in agreement with those mentioned by *DORAN, WHITE and ALLEN* (1987) and *BUKOWIECKI and BRAMLAGE* (1989) who stated that, multiple fracture of the phalanges were the prevalent types. This may be due to severe external violence. Luxation and subluxation of the distal interphalangeal joint was usually recorded with the distal phalangeal fracture, This may be due to severe traumatic causes.

In the present study fractures of the proximal sesamoid bones were recorded in the thoracic limb only. This result agreed with that of *SEVELIUS and TUFVESSON* (1963) who stated that fracture of sesamoid bones was more common in the thoracic limb than in the pelvic limb.

Osteoperiosteal reactions were recorded in the present study in a percentage of 11.2% including ring bone and splints.

Ring bone occured either in the thoracic limb or in the pelvic limb but it was more common in the thoracic limb a fact which agrees with *ADAMS* (1974), *EL-KEIEY* (1979) and *EL-GUINDY* (1990). Ring bone was met with alone or in combination with splints. This phenomenon is inagreement with *ADAMS* (1974) and *EL-GUINDY* (1990). In the present work four types of splints were recorded including postmetacarpal splint, traumatic splint, intermetacarpal splint and knee splint (*FRANK* 1959, *BERGE and MULLER* 1965, *ADAMS* 1974, *MISK and HIFNY and HIFNY* 1982 and *El GUINDY* 1990).

In the present work affections of fetlock, pastern and coffin joints alone were recorded in a low percentage (1.8%) but they were recorded in a high number in combination with other affections as shortening of the superficial and deep digital flexor tendons, fractures of phalanges and osteoperiosteal reaction. joint affections were observed more common in the thoracic limbs than in the pelvic limbs a fact opposite to what mentioned by MARTIN, MCILWRAITH, TURNER, NIXON and STASHAK (1984) who stated that affections of the proximal interphalangeal joints were more common in the pelvic limbs than in the thoracic limbs, this may be attributed to the type of work done by the animals. In their work most animals were race, jumping and riding horses, while in the present study the majority of the animals were hard working ones.

In the present study proximal interphalangeal joint was affected mainly with articular and periarticular osteoperiosteal reaction which may lead to formation of new bone growth (high true ring bone) leading to ankylosis of the joint in some cases.

Intra-articular fracture of the pastern joint was more or less common but luxation of the joint was rarely observed.

Osteoperiosteal reaction, luxation and subluxation were the most common affections of the distal interphalangeal joint.

From the present work, joints of the lower portion in equines are considered a common seat of affection, a fact which agreed with the results of GIBSON, MCILWRAITH, TURNER, STASHAK, AAENES and TROTTER (1989). In agreement with SHIROMA, ENGEL, WAGENR and WATROUS (1989) luxation and subluxation of the interphalangeal joints are usually accompanied by contraction of the deep digital flexor tendon. In agreement with EL-GUINDY (1990), constant hard work, severe trauma and fixation of the foot between two solid objects were the real causes of the joint affections.

In the present work, wounds of the metacarpus, metatarsus and phalangeal region were met with in a percentage of 5.2%. These wounds were more common in the thoracic limbs than in the pelvic limbs. The phalangeal region is considered a common seat of wounds where it become exposed to external irritation and accidents specially in hard working animals. In agreement with ADAMS (1974) and EL-GUINDY (1990) wounds of phalangeal region, metatarsus and metacarpus were characterized by hypergranulation tissue formation and lack of epithelization. In some cases, wounds of the metacarpus or metatarsus were accompanied by severe inflammation of the tendons and tendon sheaths, a fact which was stated by EL-GUINDY (1990).

From the present results, superficial and lacerated wounds of the phalangeal region when neglected, exuberant granulation tissue may develop. The same observation was stated by JONES (1986).

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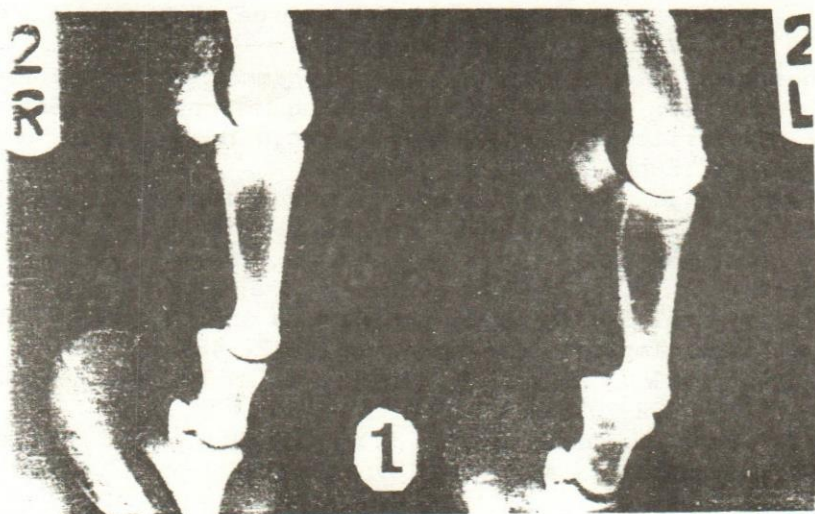
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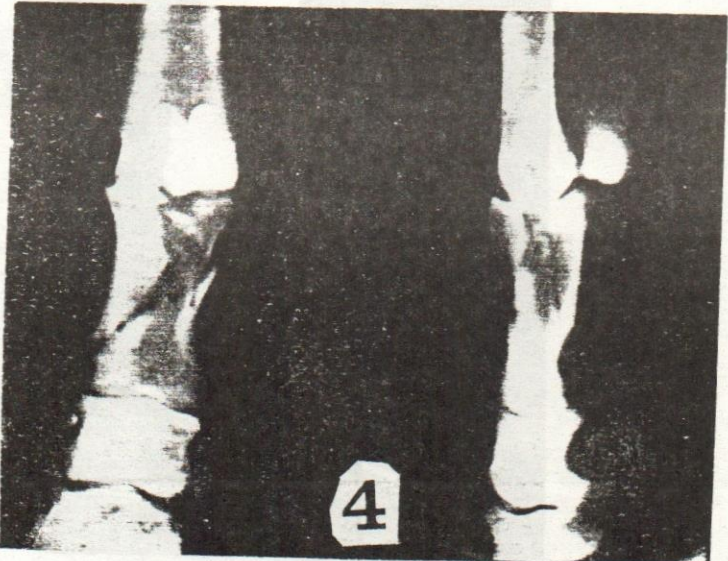
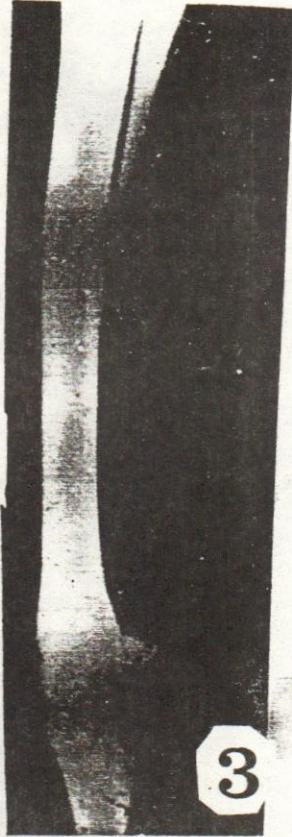
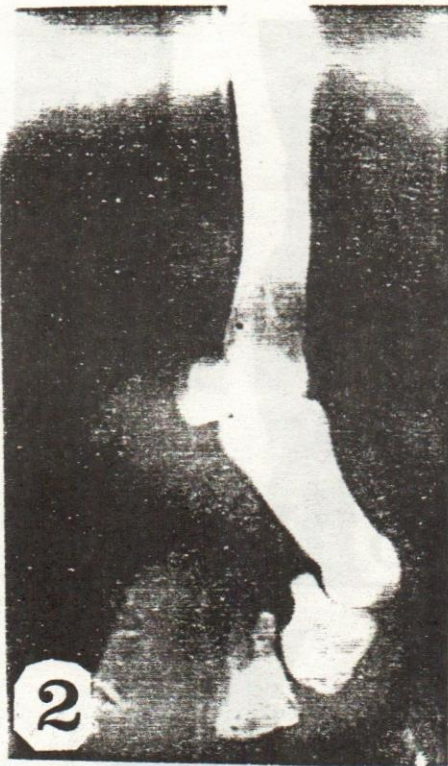
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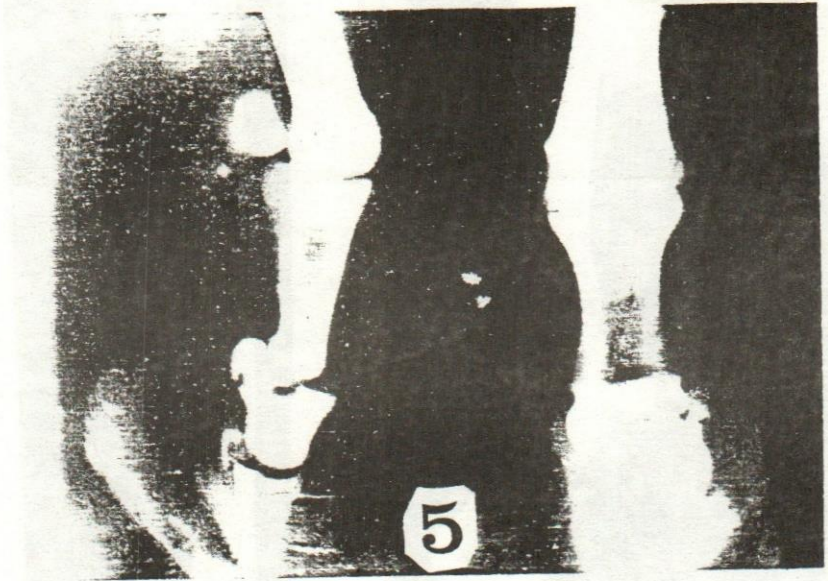
#### LEGENDS OF FIGURES

- Fig. 1: Showing chronic tendinitis and tendovainitis in the flexor tendons of the pelvic limbs in a donkey with calcification.
- Fig. 2: Showing severe shortening of the flexor tendons of the pelvic limb in a donkey with luxation of both proximal and distal interphalangeal joints
- Fig. 3: Complete, single, diaphyseal, transvers fracture of the large and small metacarpal bones in a donkey.

- Fig. 4: Complete, comminuted fracture of the proximal phalanx including the proximal articulation (fetlock joint) in a donkey.
- Fig. 5: Complete, comminuted fracture of the middle phalanx including the proximal articulation (pastern joint) in a donkey.
- Fig. 6: Complete, comminuted fracture of the third phalanx in a horse including the coffin joint.
- Fig. 7: Complete, transverse, mid-body fracture of the proximal sesamoid bones in a donkey.
- Fig. 8: High false ring bone, osselets and traumatic splint at the distal part of the metacarpal bone in donkey.
- Fig. 9: Chronic deformed arthritis of the fetlock and pastern joint in a donkey.









*SURGICAL AFFECTIONS, METACARPUS, METATARSUS, PHALANGES & EQUINES*

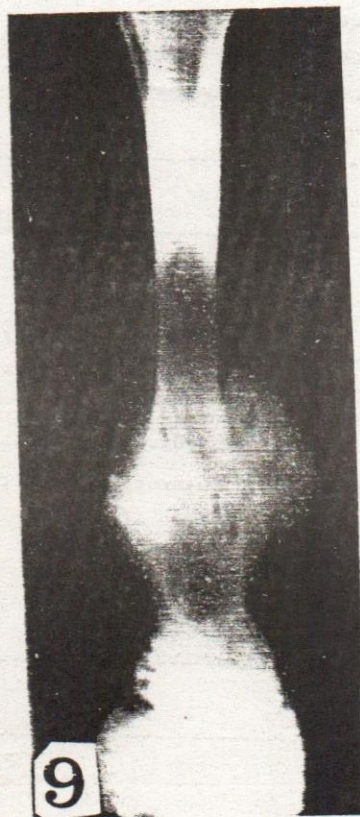
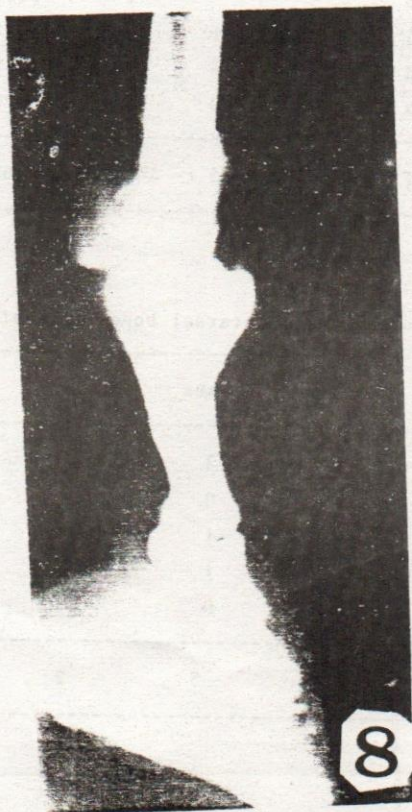
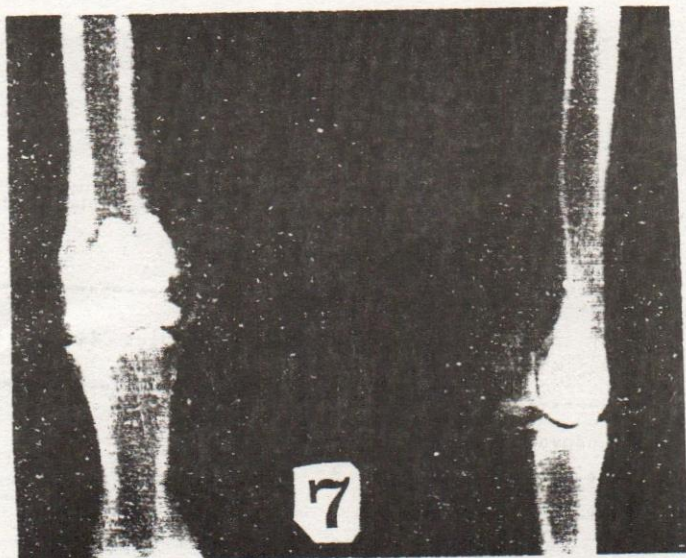


Table 1: Prevalent affections of metacarpus, metatarsus and phalanges in equines.

Affections	Donkeys	horses	mules	total	percentage
1-Tendinitis and tendovaginitis	261	20	19	300	63.0%
2-Flexural deformity	8	-	-	8	1.8%
3-Fractures of metacarpal and metatarsal bones	20	5	2	27	6.0%
4-Fractures of phalangeas	21	5	-	26	5.8%
5-Fractures of proximal s.b.	2	-	-	2	0.2%
6-Osteoperiosteal reactions	36	8	1	45	11.2%
7-Joint affections	8	-	-	8	1.8%
8-Wounds	15	7	3	25	5.2%
Total	371	45	25	441	100.0%

Table 2: Incidence of fractures of metacarpal and metatarsal bones in equines.

Fractured bones	Donkeys	Horses	Mules	Total
Large and small metacarpal bones together	8	3	2	13
Large metacarpal bone alone	6	0	0	6
Small metacarpal bone alone	1	1	0	2
Large and small metatarsal bones	3	1	0	4
Large metatarsal bone alone	2	0	0	2
Total	20	5	2	27