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الكسور والأصابات النوعية فى منطقة السلاميات فى الحمير

محمد عادل ، هارون يوسف ، فتحى مكادى

لقد تم تسجيل ثمانى حالات من الكسور ذات النوعية المختلفة وتواجدت هذه الكسور فى الطرف القاصى للعظمة المشطية الكبرى والسلامية الأولى والسلامية الثالثة فى سبعة حمير وبغل واحد .

وقد سجلت حالتان لأنزلاق فى المفاصل أحدهما فى مفصل المعقم والآخر فى مفصل القيد . وتم فحص جميع الحالات السابقة أكلينيكيا وراد يولوجيا ولقد تمت متابعة حالة مصابة بكسر جزئى فى السلامية الأولى بعد أستئصالها جراحيا بالأشعة السينية ودلت نتائج الصور الشعاعية على وجود قسط فى مفصل المعقم

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SPECIFIC FRACTURES AND INJURIES IN THE PHALANGEAL REGION IN DONKEYS

(With 12 Figs.)

By

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SUMMARY

Eight cases of varying types of fractures involving the distal end of the metatarsal bone, first phalanx and third phalanx were recorded in 7 donkeys and one mule. Two cases of luxation in the metacarpophalangeal and pastern joints were reported. All cases were clinically and radiographically examined. Surgical removal of an intra-articular chip fracture was applied in one donkey and followed radiographically indicated that ankylosis of the fetlock joint took place.

INTRODUCTION

Fractures of long bones of horses are usually common. However, fractures of small bones such as carpal bones, sesamoid bones, phalangeal bones and navicular bone have a low incidence because of differences in shape, cortical thickness, trabecular arrangement and angulation.

Traumatic injuries account for most pathological changes resulting in lameness. Such injuries may be due to direct trauma and or sprains (GILLETTE, *et al.* 1977). The history of a fracture case frequently reveals massive trauma such as being struck by movable vehicle stepping into a hole while running, or catching a leg in a gate or fence.

Luxation of the metacarpophalangeal joint is a common injury particularly in cattle and horses. It is frequently sustained when an animal steps into a hole or gets a foot caught fast, and struggles to gain freedom (FESSELER, *et al.* 1974).

LOSE (1981) stated that subluxation of the fetlock joint occurs at the articulation of the first and second phalanx and is usually seen in straight-legged young horses being worked vigorously for the first time.

The diagnostic signs and symptoms are well covered by ROONY (1969), ADAMS (1974) and FESSELER, *et al.* (1974). Radiographic interpretation is helpful to arrive at a diagnosis (MORGAN, 1968 and GILLETTE, *et al.* 1977).

In this report, the radiological findings in different types of intra-articular fractures affecting the fetlock pastern and coffin joints are described. Radiographic evidence of periarticular bone proliferation, articular changes, which include osteophyte formation, decrease joint space and even ankyloses of the fetlock joint after surgical removal of intra-articular chip fracture of the first phalanx in a donkey. Radiographic signs accompanied with luxation of the fetlock and pastern joints were reported in 2 donkeys. The cases also demonstrate the variety of fractures which can be encountered in the first and third phalanx in donkeys.

M.A. ALI, et al.**MATERIALS**

Ten cases varying in age and sex were presented to surgery clinic, Faculty of Vet. Med. Assiut University, in time between 1983 and 1985 exhibiting non-weight bearing lameness in one of the extremities, except two cases which showed medium degree of lameness.

Case 1: A one year-old male donkey was admitted because of left hindlimb severe lameness and unable to bear weight. The fetlock reigon showed severe painful swelling and injury of the skin at the lateral aspect. Abnormal mobility and cripitations were detected.

Radiographic examinations: Anteroposterior and lateral views (Fig. 1) showed longitudinal fracture of the distal end of large metatarsal bone extending into the articular surface of the fetlock joint. Dislocation of one half of the distal end of the large metatarsal bone was observed to extend below the level of the fetlock joint. The other bone fragment was seen still in its normal position. The joint space was increased in size as a result of dislocation. Swelling of soft tissues around the fetlock joint was clearly noticed.

Case 2: A 18 month-old donkey was presented because of right forelimb lameness and swelling of the fetlock joint. Slight swelling and lameñess had been evident for two months and was becoming progressively worse. A scar was observed on the lateral aspect of the joint indicating the presence of a previous wound.

Radiographic signs from AP view showed luxation of the fetlock joint. The medial condoyl of the metacarpal bone over rid the glenoid cavity of proximal end of the first phalanx. There was also increase in the joint space from the lateral side of the joint (Fig. 2).

Case 3: A 6 month-old male donkey was referred because of right forelimb lameness of two week duration. The lameness was acute in onset and persisted. The fetlock reigon was large in size and its extention and flexion revealed severe pain.

Radiographic examination in AP view revealed articular chip fracture on the medial side of the proximal extremity of the first phalanx. Peri-articuloar bone proliferation involving the distal end of the large metacarpal bone as well as marginal osteophytes were also observed. Deformity of the joint space resulted from the process of degenerative changes in the articular cartilage (Fig. 3).

Surgical preparation and technique:

The operation was made under the effect of deep narcosis using 10% chloral hydrate in a dose of 5 g/50 Kg.B.W. The affected limb was clipped from the coronary band to about 5 cm proximal to the metacarpophalangeal joint. The dorsal surface of the limb as well as the lateral and medial side were shaved and scrubbed with tincture of iodine for 10 nimutes. A longitudinal skin incision about 5 cm long was made on the medial aspect of the limb at the level of the fetlock joint between the common digital extensor tendon and medial collateral ligament. The joint capsule was severed. The bone fragment was easily removed through that incision with a bone forceps by dissecting from the surrounding tissue. Injection of one million i.u. of procaine penicillin dissolved in 12 ml aqua distillate into the joint cavity was done. The joint capsule was closed with simple continuous suture using 4/0 plain catgut with simple continuous suture. Skin was closed with silk No. 1 using interrupted sutures. The limb was radiographed immediately after operation to ensure the complete removal of the chip fracture (Fig. 4). Fixation of the limb using plaster of paris bandages from the middle of the large metacarpal bone to the hoof was performed.

FRACTURES IN PHALANGEAL REGION

Post-operative treatment:

The animal was given a prophylactic dose of anti-tetanic serum 3000 i.u./s.c. Systemic antibiotic penicillin-streptomycin (in a dose of 10,000 i.u. penicillin and 12.5 mg dihydrostreptomycin per Kg.B.W. for 4 successive days. The sutures were removed after 10 days and the limb was rebandaged for 8 weeks by a plaster cast. The bandage was removed and limb radiographed then an ordinary gauze and cotton bandage was applied for 2 weeks.

RESULTS

Clinical examination revealed more or less swelling of the fetlock joint. The animal can bear weight on the affected limb without pain. Slight degree of mechanical lameness was observed at trot. Radiographic findings showed complete ankylosis of the fetlock joint. Articular and periarticular bone proliferation on both sides of the fetlock. Marginal bone exostosis on the distal end of the large metacarpal bone and proximal end of the first phalanx were observed. The joint space was absent in the lateral view accompanied with ossification between the proximal sesamoid bones and large metacarpal bone (Fig. 5).

Case 4: A 5 years old female donkey was presented with severe lameness in the right hindlimb with enlargement of the phalangeal region. Abnormal mobility and crepitation sound were present. All signs of inflammation were observed.

Radiological examination of the phalanges showed in AP & LM views an intra-articular, comminuted fracture of the first phalanx involving both fetlock and pastern joints (Fig. 6).

Case 5: An 8 month-old male donkey was admitted because of left forelimb lameness. Firm enlargement of the first phalanx and on palpation pain was clearly evident.

Radiological findings showed a longitudinal fracture of the first phalanx starting from the upper third and directed downward. Periosteal periarticular bony proliferation indicated the healing of fractured bone (Fig. 7).

Case 6: A 2 years old male donkey suffered from a severe degree of lameness in left forelimb. The animal bears weight on three limbs and the affected one was bleeding severely from an accidental wound. Abnormal mobility as well as crepitations could be easily detected in this case.

Radiological examination revealed an oblique fracture of the first phalanx associated with some bone specules (Fig. 8).

Case 7: A 3 years old male donkey was presented because of left forelimb lameness. There was a hard swelling on the medial side of the fetlock joint. Passive movements revealed ankylosis of the fetlock joint.

Radiographic examination showed an old longitudinal fracture of the first phalanx starting from the distal third upwards, complete ossification of the medial side of the fetlock joint. The joint space was narrow (Fig. 9).

Case 8: A one month old male donkey was referred because of malconformation of the right forelimb after birth. There was hard enlargement around the pastern region. Flexion and extension of the joint revealed abnormal mobility, frequent stumbling during motion was also observed.

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Radiological examination showed that there was subluxation of the pastern joint. The distal end of the first phalanx overrode the second phalanx. There was somewhat torsion of the second and third phalanx (Fig. 10).

Case 9: A 6 years old female donkey was presented because of severe degree of lameness on the left forelimb. The coronary region was highly swollen and hot. The animal cannot bear weight on the affected limb. Crepitation sounds were not present. Percussion revealed severe pain all over the wall of the affected hoof, while compression by the hoof tester revealed severe pain at the lines of fracture and slight pain away from the line of fracture.

Radiological examination showed that there was a comminuted fracture of the third phalanx involving the hoof joint. The fracture presented a sagittal fracture, fracture of the extensor process and the wing of the third phalanx. The hoof appears as the claw of a ruminant (Fig. 11).

Case 10: A 9 years old male was presented with right forelimb lameness. The animal was unable to bear weight on the affected limb. There was severe haemorrhage from skin at the coronet and the hoof was twisted laterally.

Radiographic examination showed complete separation of the articular surface and subchondral bone from the third phalanx. The pedal bone was twisted laterally and directed upwards (Fig. 12 A&B).

DISCUSSION

The discussion will be confined to those changes associated with the intra-articular fractures of the phalangeal bones and can be demonstrated radiographically. The radiographic examination is essential for diagnosis and prognosis.

GILLETTE, *et al.* (1977) stated that fractures must be differentiated from dislocations and other traumatic injuries. Artifacts may appear as a fracture line. A true fracture line will not extend beyond the margin of the bone.

The radiographic appearance of these reported fractures depends on its location. Ordinarily, the fracture appears as one or more radiolucent lines. It may be incomplete involving the periphery as in case No. 5 and 7 or a complete fracture extending through the entire bone as in case No. 6 and usually extending into the joint as in case No. 1, 3, 4, 9 and 10.

The same author added that fracture line of the third phalanx must be differentiated from the normal vascular channels, if a line crosses these channels at an angle, it is indicative of a fracture.

Several radiographic views are necessary to evaluate an accurate diagnosis. The views which are recommended by DOUGLAS, *et al.* (1963) and GILLETTE, *et al.* (1977) for routine use in examination of the phalangeal bones and joints are antero-palmar, latero-medial and oblique views.

The prognosis for fractures involving the phalangeal bone is dependent upon the location of fracture and the response to treatment. Articular fractures involving the phalangeal joints frequently fail to heal and the prognosis is unfavourable (FESSLER, *et al.* 1974).

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It is not worthy operating on complicated comminuted or splintered fractures because the fixation will never be stable; in addition there is a risk of infection without a chance for functional rehabilitation. In most cases of comminuted fractures it is impossible to maintain by fixation the length and axis of the bone, the horse must usually be destroyed (VON SALIS, 1972).

The results of treating cases of complete compound fractures of the large metatarsal bone, complete compound oblique fractures of the first phalanx, comminuted fracture of the third phalanx, and subluxation of the fetlock and pastern joints were not promising, a result which is in agreement with which was mentioned by (VON SALIS, 1972; ADAMS, 1974 and FESSELER, *et al.* 1974).

The result of the present work in the case of chip fracture of the first phalanx coincide with those represented by (FACKELMAN, 1973 & 1982; ADAMS, 1974; FESSELER, *et al.* 1974 and KAMIS, *et al.* 1982). The prognosis of surgical removal of chip fracture of the first phalanx depends mainly on the degree of damage reflected on the articular cartilage and timing of the operation is decisive as it is necessary to operate as recent as possible to avoid the expected joint ankylosis of that joint, this expected result is recorded by (FACKELMAN, 1973 & 1982; ADAMS, 1974 and FESSELER, *et al.* 1974).

Severe compound dislocation of the fetlock joint and injuries of the metacarpus should be given a poor prognosis due to lack of soft support, which interferes with vascular and nerve supply to the injured area (LUNDVALL, 1963). FORBES, *et al.* (1979) reported that a compound dislocation of the fetlock joint in a pony filly was successfully treated by surgical arthrodesis.

Pastern luxations have been treated by corrective shoeing designed to provide better alignment of the phalanges. Such treatment provides only temporary relief, however, the signs recur with continued foot growth (LOSE, 1981).

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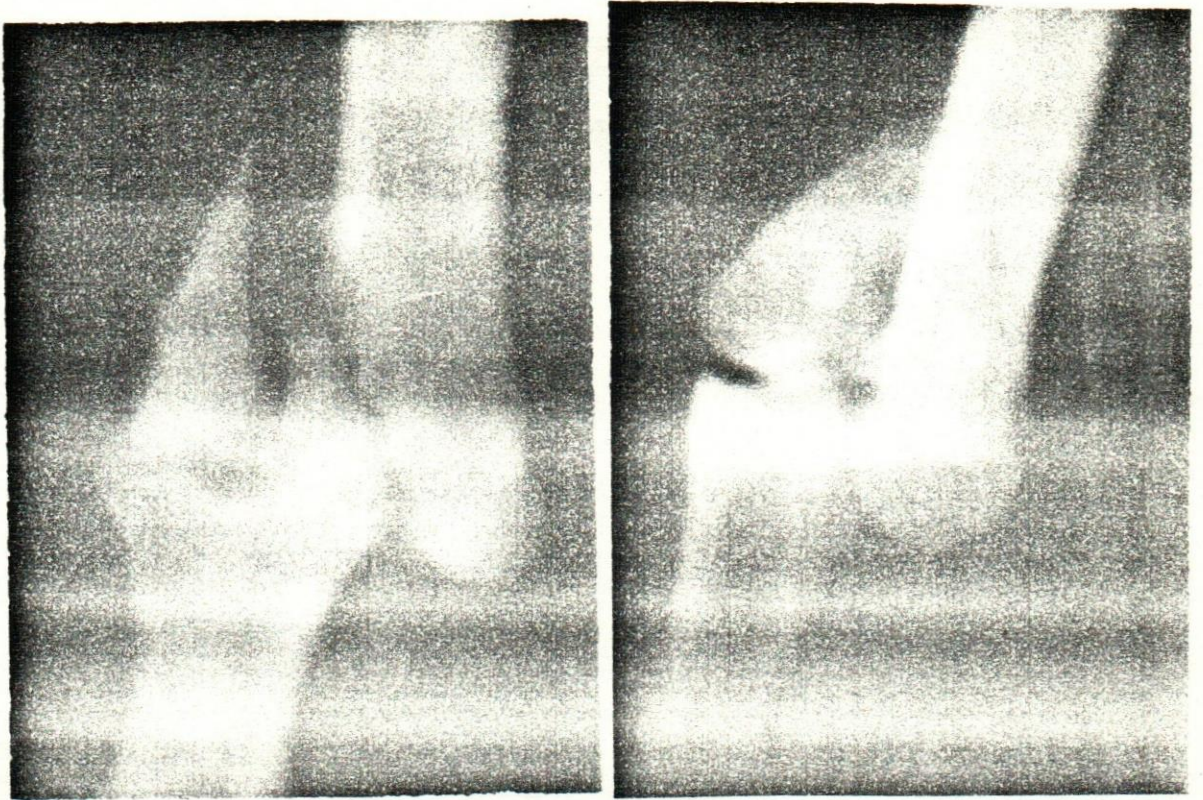


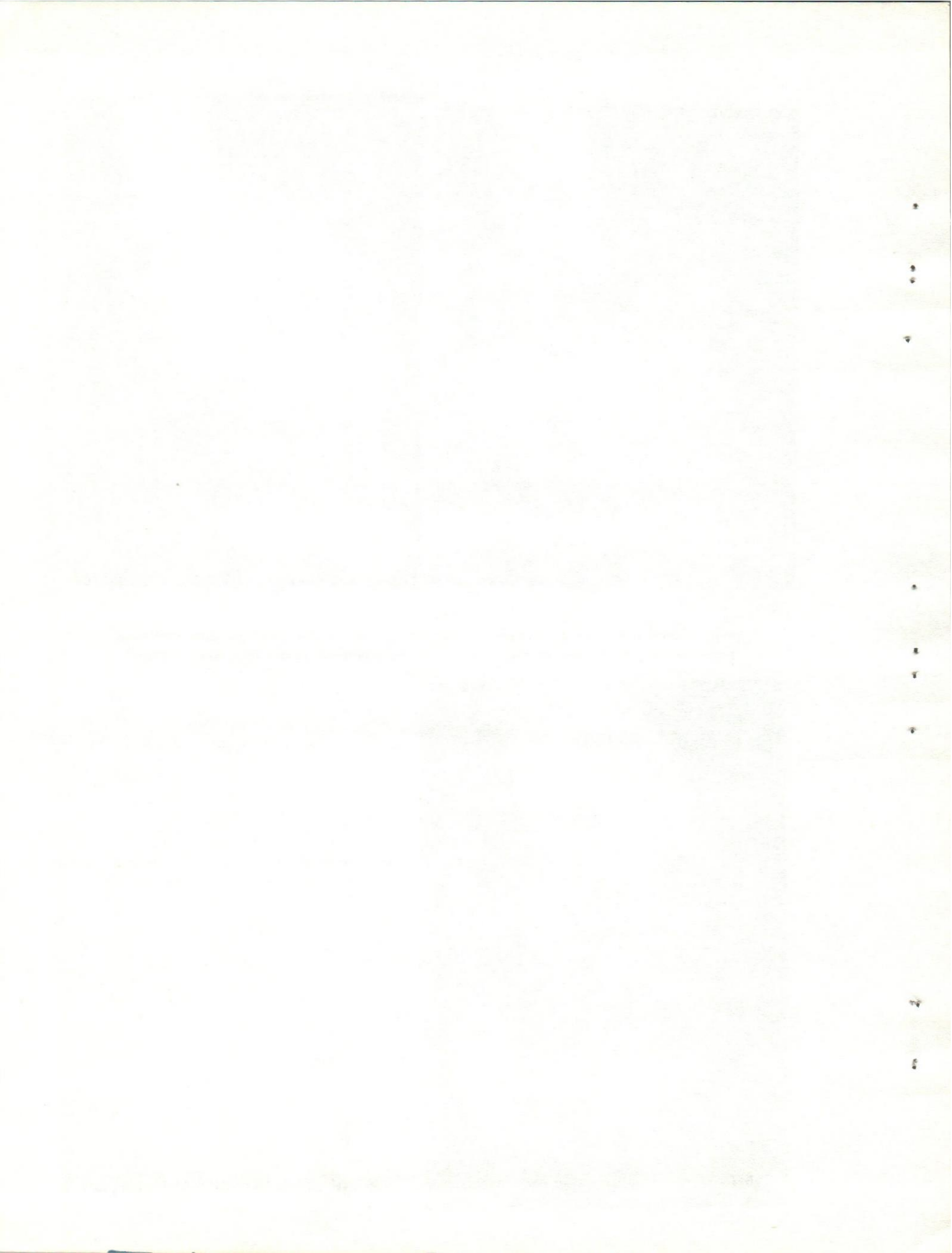
Fig. (1)

AP & LM views showing a longitudinal articular fracture of distal end of large metatarsal bone (arrow), dislocation of the fetlock joint, and increase in the joint space (arrow)



Fig. (2)

AP view showing luxation of the fetlock joint.
The joint space is increased in size



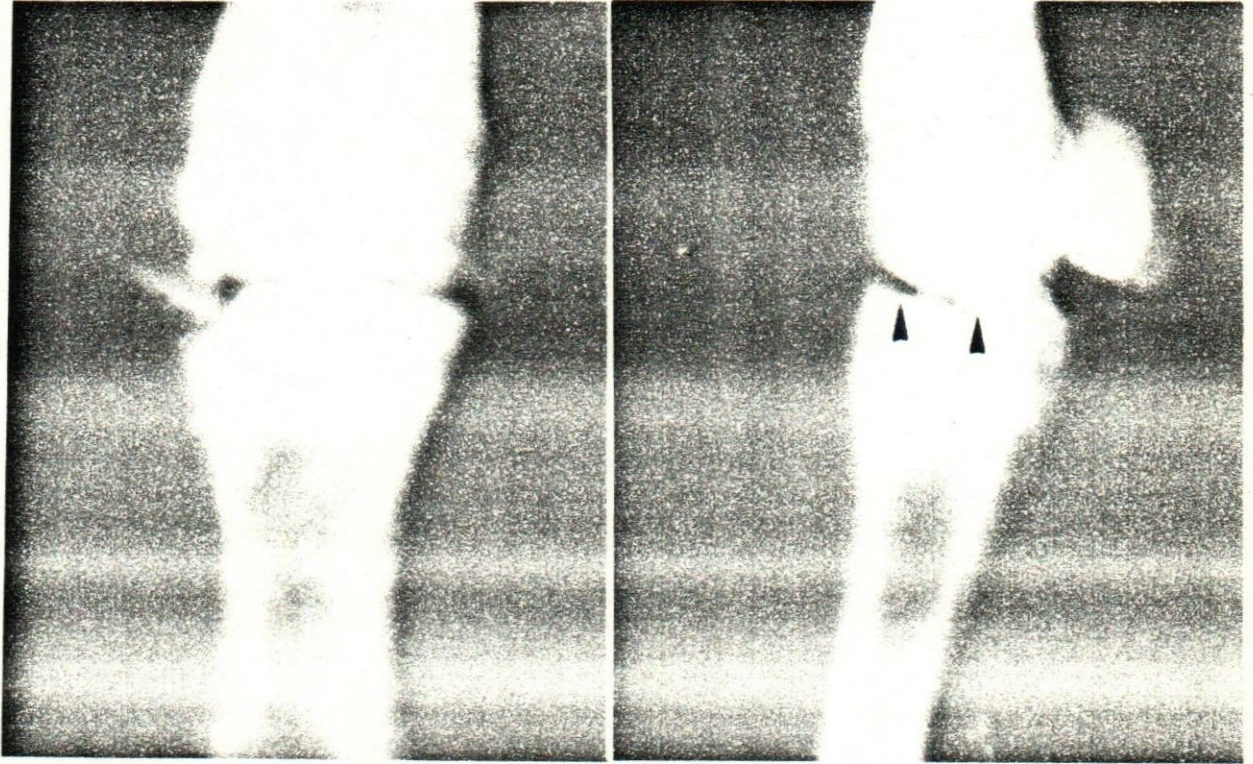


Fig. (3)

AP & LM views showing chip fracture in the first phalanx, peri-articular bone proliferation on the distal end of the third metacarpal bone, marginal osteophyte and deformity in the joint space (arrow)

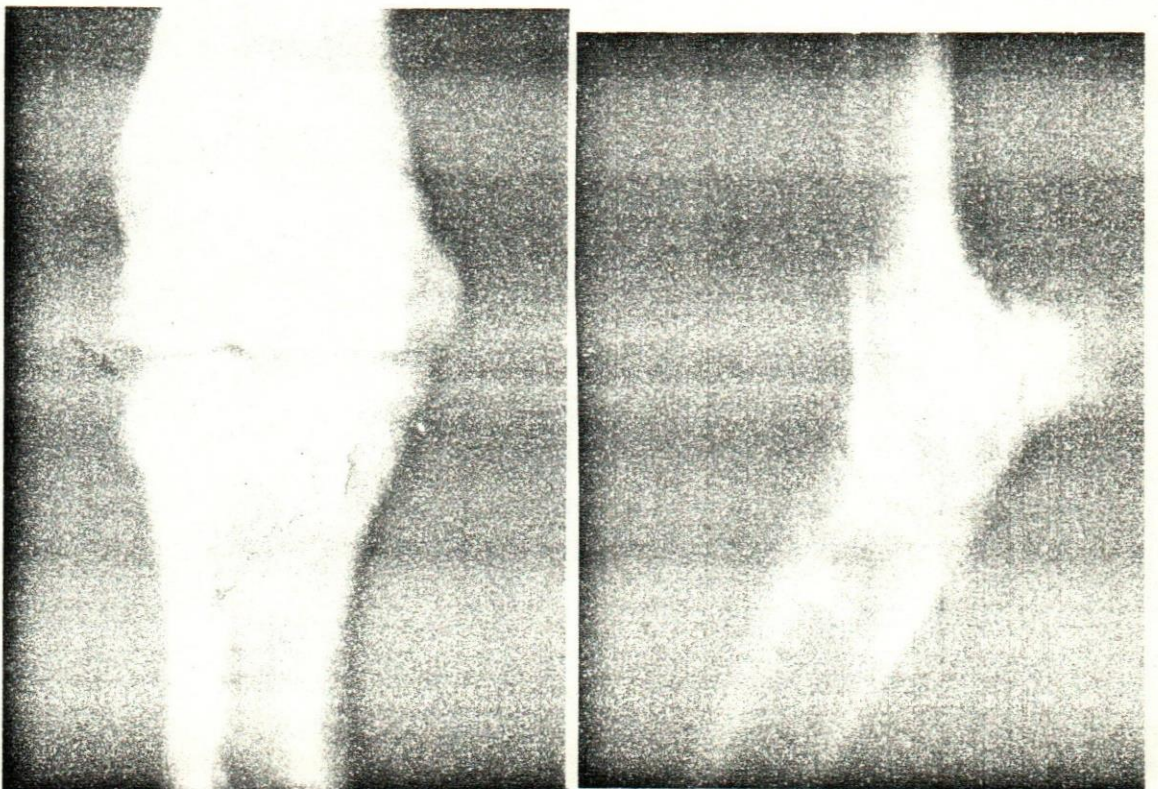


Fig. (4)

AP & LM views of the fetlock joint after removal of chip fracture (arrow)

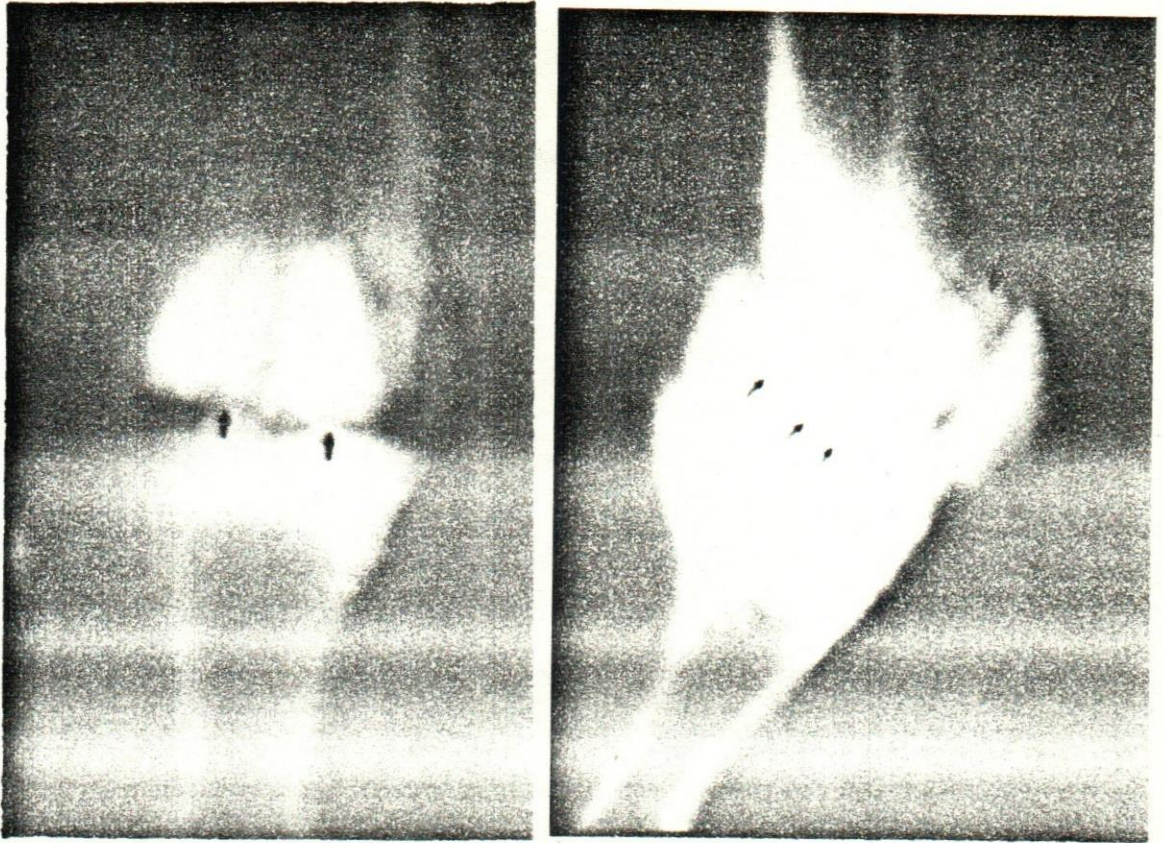


Fig. (5)

Complete ankylosis of the fetlock joint in 8 weeks after surgical removal of the articular chip fracture, articular and periarticular bone proliferation and marginal bone exostosis

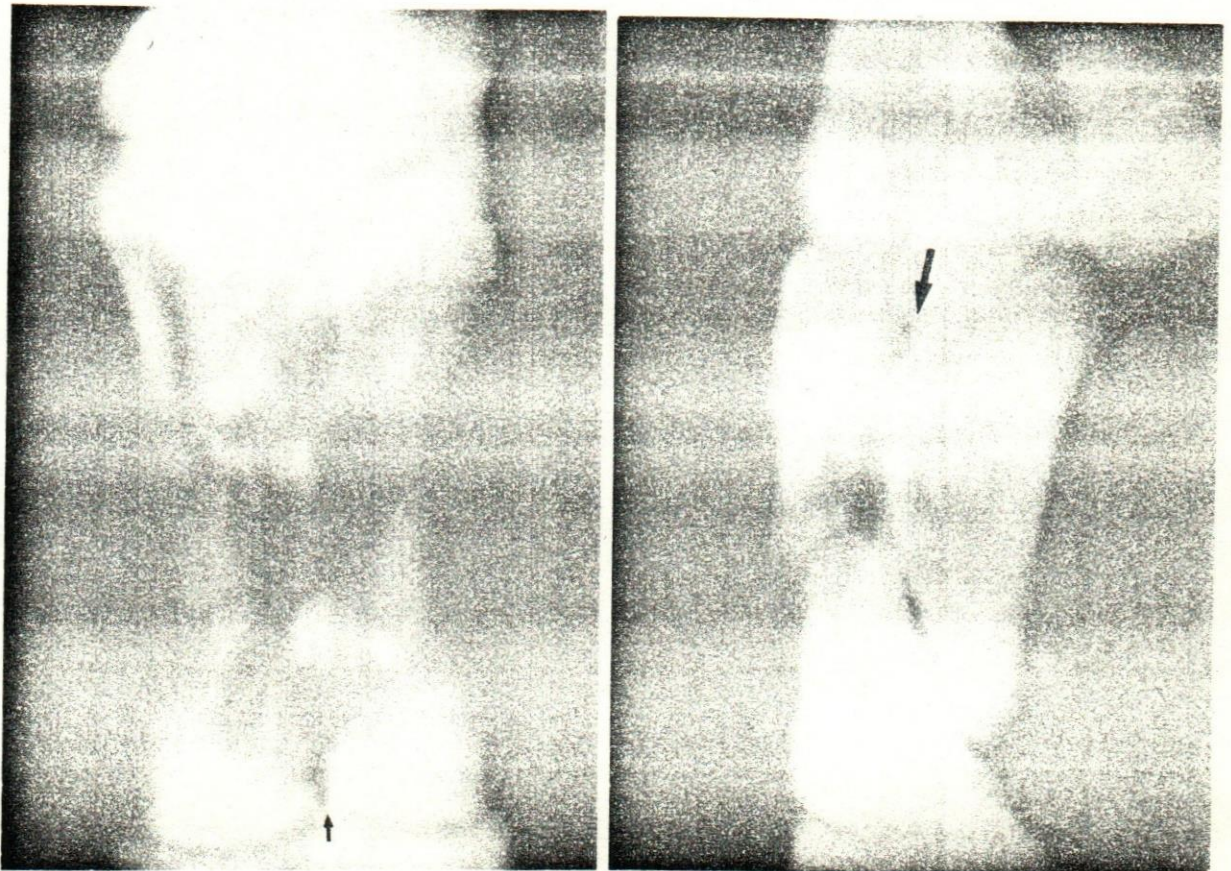


Fig. (6)

Comminuted fracture of the first phalanx, both fetlock and pastern joints were involved (arrow)

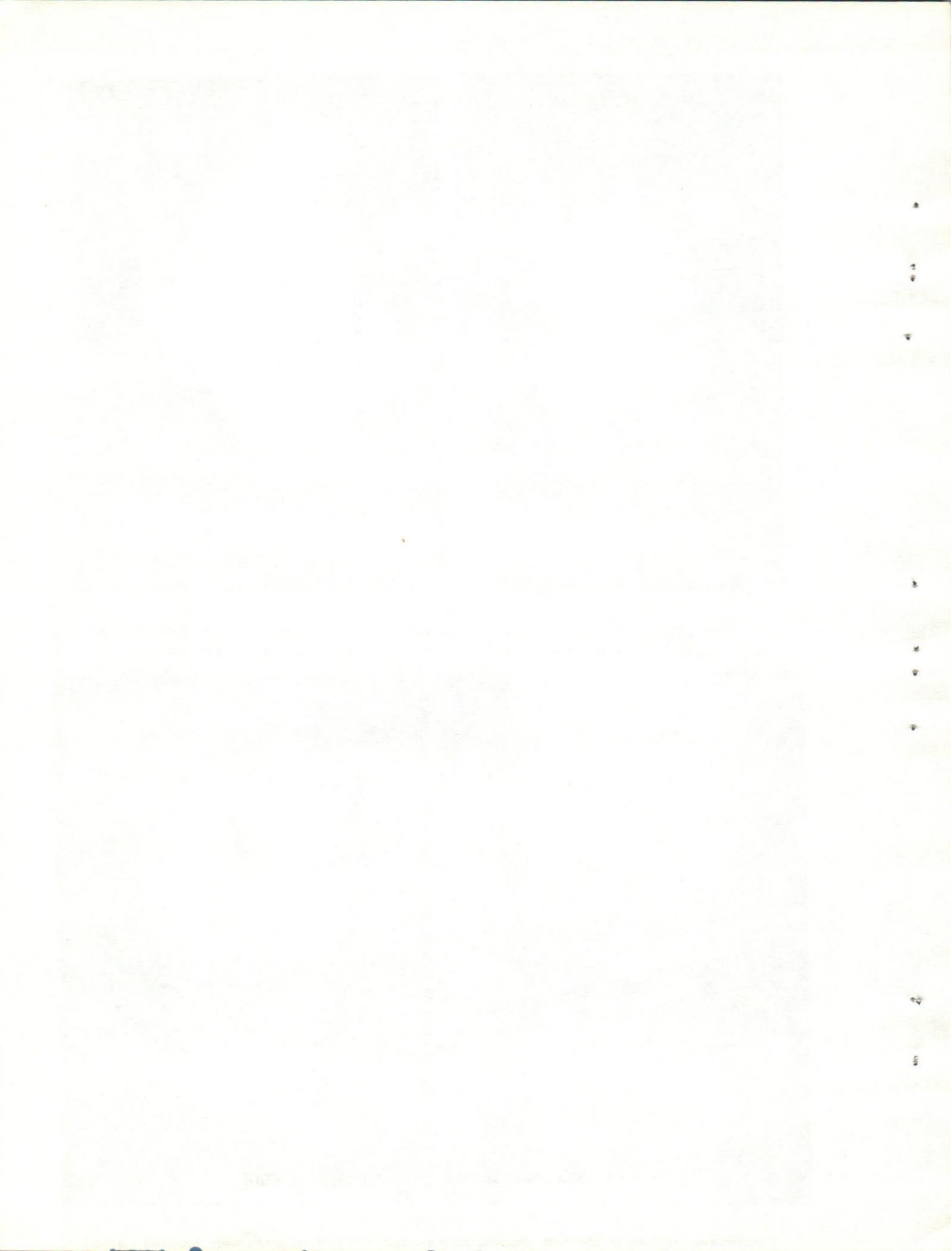




Fig. (7)

Longitudinal fracture of first phalanx, periosteal reaction was clear



Fig. (8)

Oblique view showed oblique fracture of the first phalanx with bony spicules. The line of fracture was clear (arrow)

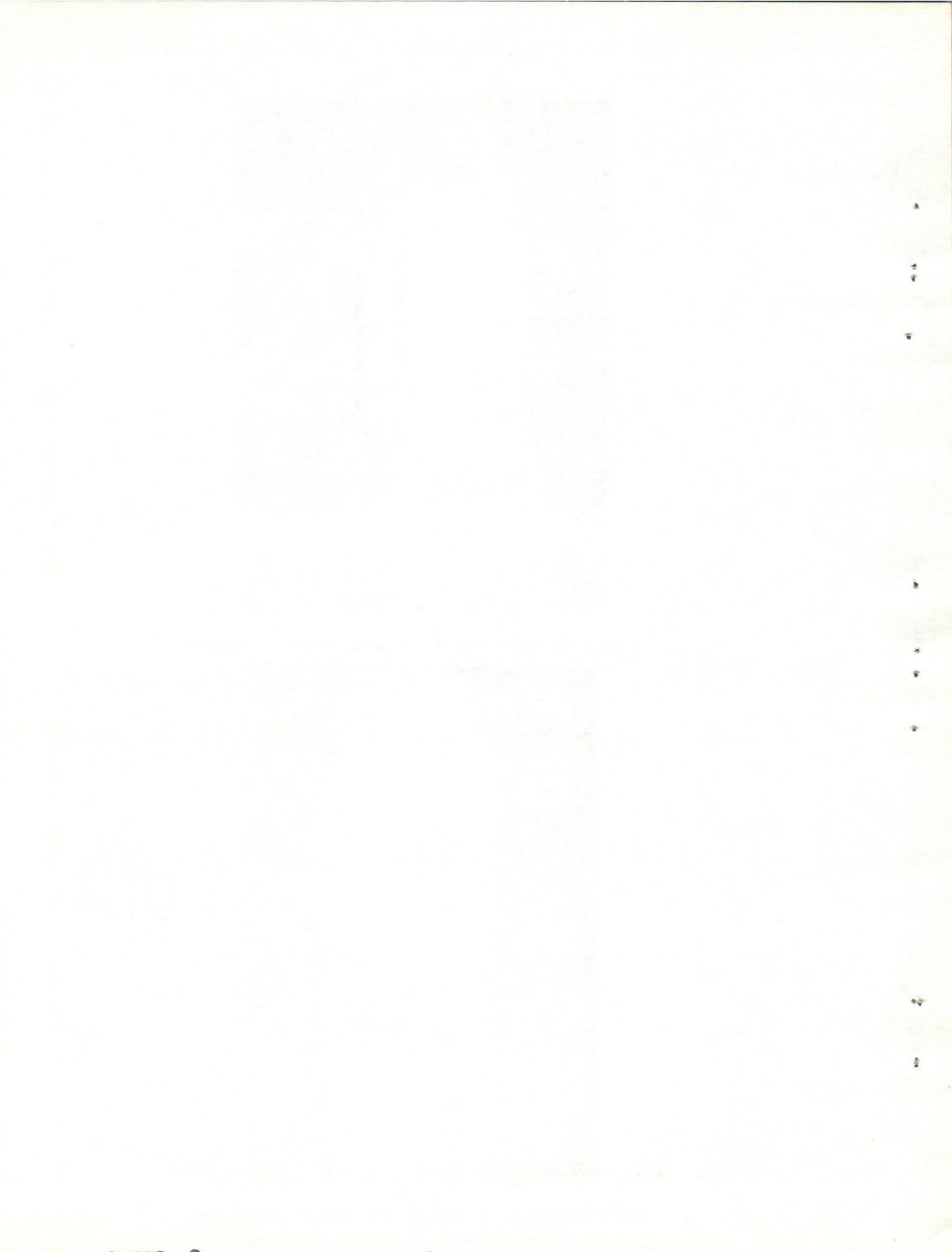




Fig. (9)

Longitudinal fracture of the first phalanx accompanied by ankylosis of the fetlock joint (arrow)

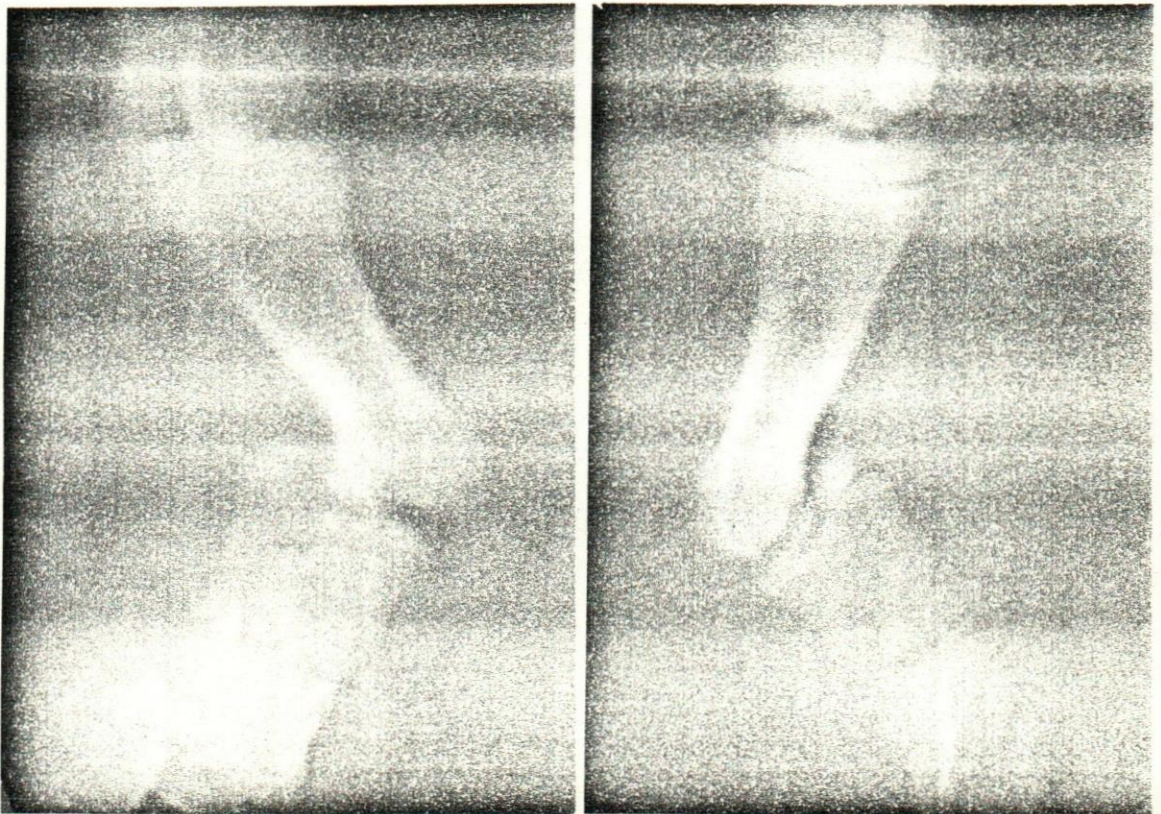
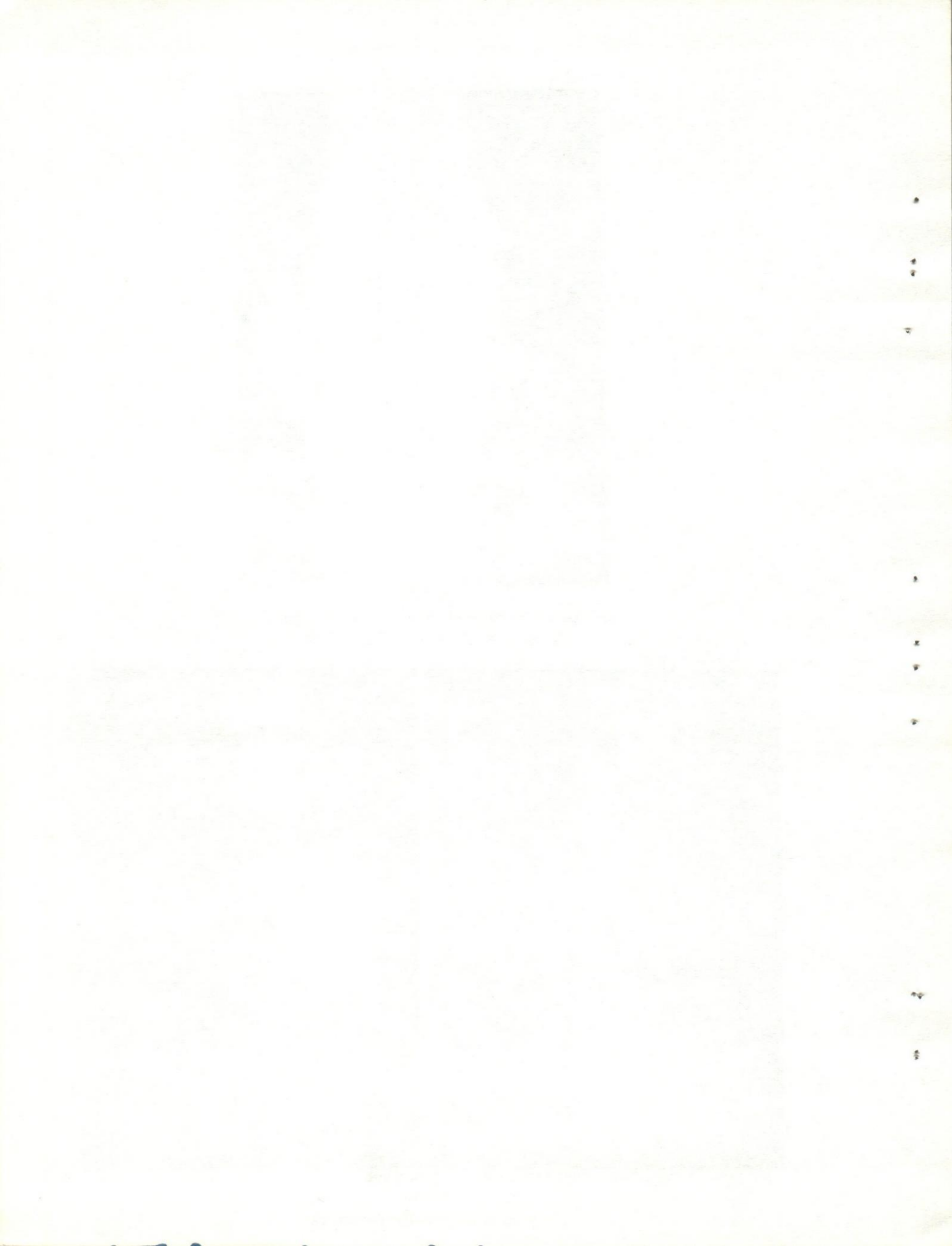


Fig. (10)

Showing luxation of the pastern joint



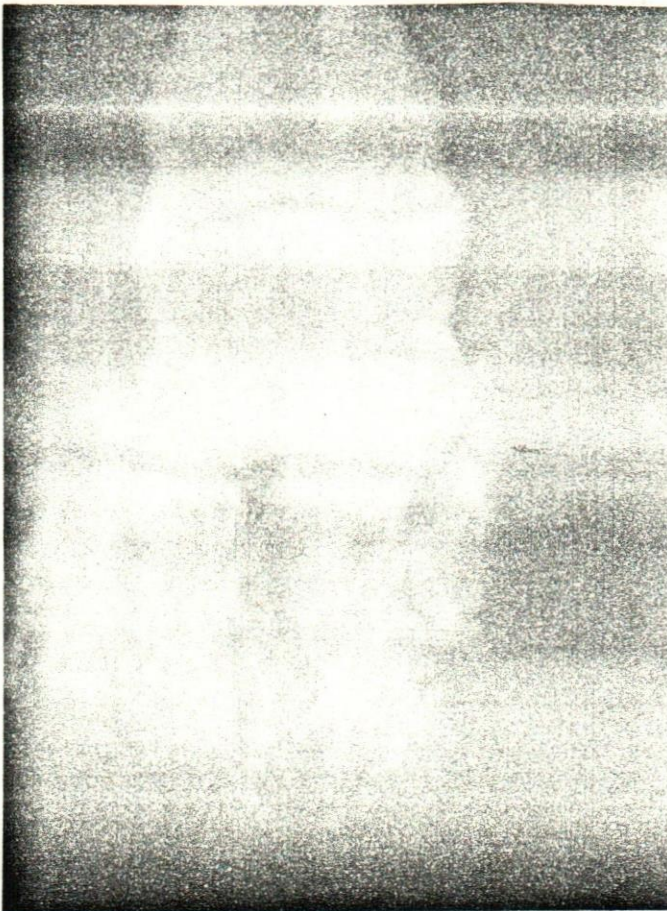


Fig. (11)
Comminuted fracture of the third phalanx
(saggital fracture of the
extensor process and the wing
of the third phalanx

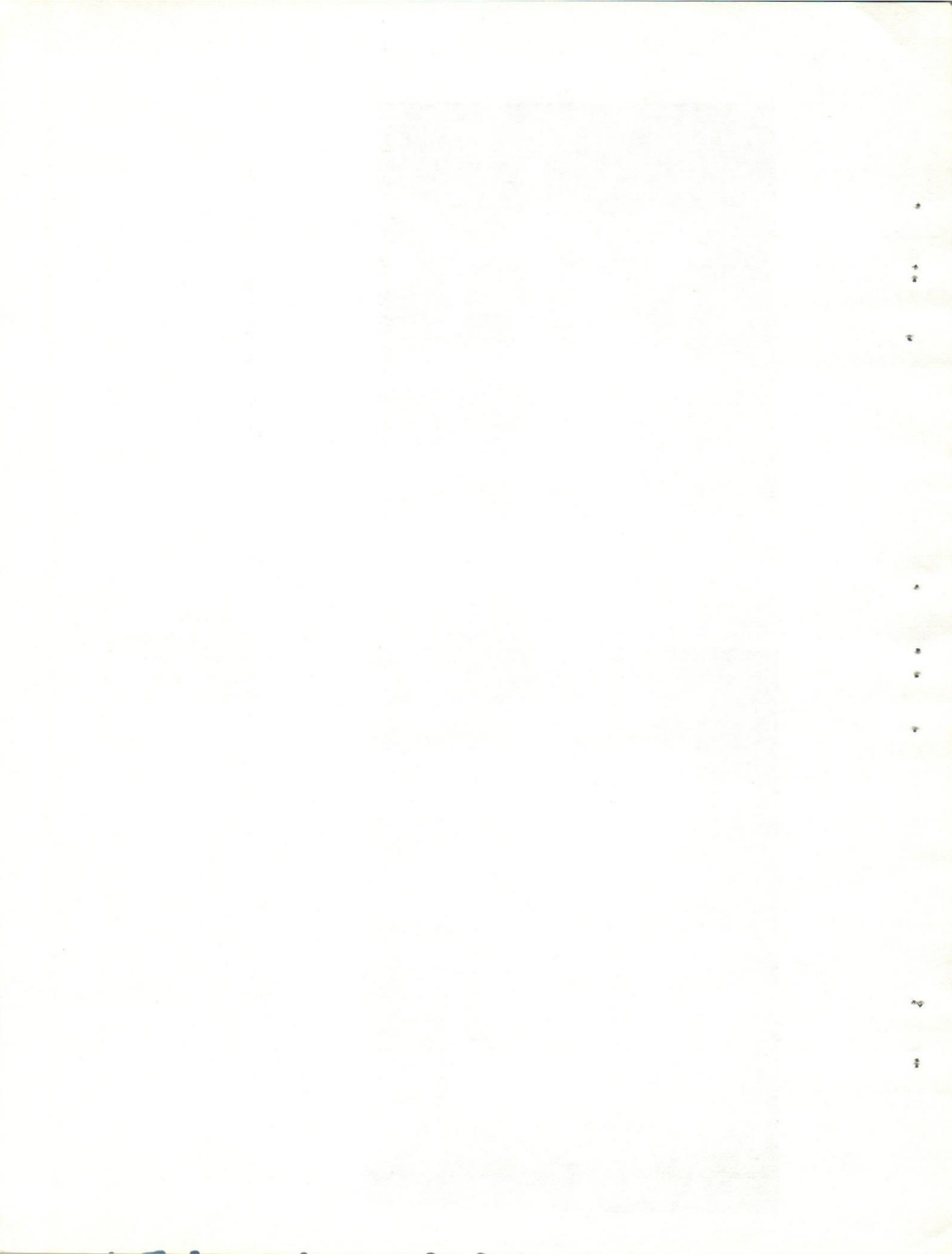




Fig. (12)
A & B: Separation of the articular
surface and subchondral bone from
the third phalanx. Fracture of the wing
of the third phalanx

