



Sudan University of Science and Technology

Collage of veterinary medicine



Investigation of A clinical Reptile Case And Laboratory

Induce Fracture In Mammals (Goats)

التحقق من حالات الزواحف السريرية و المعملية لحث كسر في الثدييات (الماعز)

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الآية

قَالَ تَعَالَى:

﴿أَوَلَمْ يَرَوْا أَنَّا خَلَقْنَا لَهُمْ مِمَّا عَمِلَتْ أَيْدِينَا أَنْعَامًا فَهُمْ لَهَا مَالِكُونَ ﴿٧١﴾

وَذَلَّلْنَاهَا لَهُمْ فَمِنْهَا رَكُوبُهُمْ وَمِنْهَا يَأْكُلُونَ ﴿٧٢﴾ وَهُمْ فِيهَا مَنَّاعٌ وَمَشَارِبٌ أَفَلَا

يَشْكُرُونَ ﴿٧٣﴾

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الإهداء

الى كل من أضاء بعلمه عقل غيره او هدى بالجواب الصحيح حيرة سائليه فأظهر بسماحته تواضع العلماء وبرحابته سماحة العارفين.

الى البروف :احمد عبد الله سنهوري.

الى كل أب وكل أم لم يبخلوا علينا بشئ نقول لهم وهبتمونا الحياة والأمل والنشأة على شقف الأطلاع والمعرفة والى اخواننا واسرنا جميعاً.

إهداء الي جامعة السودان للعلوم والتكنولوجيا التي ظلت تنير دربنا وتدعمنا.

الى زملائنا وزميلاتنا يانعماً مانزل الكرام بساحة إذكل قفر بلكرام مطير عجباً إذا نزل الكرام بجربة تؤتى ثماراً مالهن نظير .

الى الزميل عبد الرحمن محمد عبد الرحمن الخضر و محمد ابراهيم جباره.

كل الشكر موصول الى الدفعه 13 بيطره.

إهداء خاص الى البروف: امل عمر بخيت لكل ماقدمته لنا من دعم معنوي ومادي واكاديمي.

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Abstract

The present studies were carried out on 2 goats, Goat NO1: had an induced fracture on the metacarpal bone fixed externally with a recycling material (disposed pipes fixed with nails and nail nuts).

Complete reduction was achieved, the first attempt of the fractured limb for weight bearing was observed four hours and a half from the start of the operation .Twenty four hours later the nails and the pipes were still intact. The last study was carried on goat NO2: firstly a modified door hinge was fixed as internal fixture with four nails 2 on each side of the fracture ends, 11 days later X-ray picture revealed non union and movement of the nails. External fixation with Pin tract drainage was done using (EØ3, 5mmX150mm, 316L, Ø4X200mm CE),yellowish discharge were seen two weeks from the beginning of the operation, pins driven through the fracture site did not cause any delay in fracture healing.

It is therefore, concluded that as far as this trial is concerned external fixation had advantage over the internal fixation in goats.

Key words:

Goat,Fracture,Fixation,Bones.

الخلاصة

-الدراسات العملية اجريت على معزتين .المعزة الاولى كان بها كسر في عظم الساق (Metacarpal bone)وعولجت بجبيرة خارجيه واشتملت على مهملات (مواد قابلة لاعادة التصنيع والتدوير) (bone Recycling) من مواسيرواربعه مسامير احكمت بواسطة اربعة صواميل . كان التثبيت جيداً كما أن المحاولة الاولى للمعزة للتحميل على القائم المصاب سُجّلت بعد اربعة ساعات ونصف من بداية العملية. بعد انقضاء اربع وعشرون ساعة من اجراء العمليه ما زالت الجبيرة بحاله جيدة وجيدة التثبيت .

-الدراسه الأخيرة إُشتملت على تثبيت كسر بواسطة مفصلة باب ومسامير في المعزة الثانية والتي كان بها كسر في عظم الفخذ وأجريت العملية في منطقة الفخذ وكان التثبيت بها داخلياً مساميرين في كل طرف من طرفي الكسر. بعد أحد عشر يوماً أُخذت صورة الأشعة السينية واطهرت عدم التئام الكسر (Non union) كما أن المسامير تحركت من مكانها .

أجريت عملية تثبيت خارجي بعد اخراج المفصلة والمسامير باستعمال الجهاز

(EØ3, 5mmX150mm, 316L, Ø4X200mm CE.)

لوحظ خروج سائل اصفر اللون بعد اسبوعين من العملية كما أن المسامير لم تؤثر علي عملية الالتئام .

وفي الختام وُجد أن التثبيت الخارجي أجدى من التثبيت الداخلي في الأغنام .

الكلمات الرئيسية:

ماعز،كسر،تثبيت،عظام.

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List of abbreviations

Intravenous	i.v.
Intramuscular	i.m.
Subcutaneous	S/c
Beat	B
Kilogram	kg
Milligram	ml
breath	brth

Introduction

The major complications for fracture in race horses in the Sudan, they have no alternative to seek except they shoot them with the gun and render them dead.

The present study was carried out on Sudanese Nubian goats to create a path for dealing with these fracture especially in valuable studs .We are hoping by introducing this clinical trial to stop killing of valuable animals instead , tell those who are in concern to stop ritual killing and seek a modernized humane way of fixing the fracture.

Incidence of femoral fracture was higher in goats most of them occur in the mid-shaft as simple, transverse and oblique fractures and rarely comminuted fractures. These fractures are treated by external

and internal fixation in the past such as intramedullary pins, plates and screws, and most of them with the plaster splint (gypsum)as external fixture. They were found to be instable, moreover, motion and the inquisitive nature of the goat predisposes to bad alignment and none healing of the fracture. Additionally, should the migrating pin penetrate the skin or any vital organ, the fracture site may become infected and suppurated leading to osteomyelitis. Complete healing of bone using internal fixation needs special surgical instruments such as pins, plates, screws, and pin chuck and pin cutters which are costly. Furthermore, these implants have to be removed in another operation after complete healing of the fracture.

Therefore, the present studies with the recycling materials (pipes) as external fixation were used to decrease the cost of internal fixation and to replace unstable plaster splint in the goat

Objectives

- Treatment of fractured horses and stop ritual killing of them,seek amodernized humane way of fixing the fracture.
- The purpose of the present study is to give an account of the clinical and radiographic examination of femoral fractures in goats as well as successful reduction of the fracture using a compound of internal fixture (door hinge) and external fixture.

Chapter one

Literature review

Femoral fractures commonly occur in goats following different type of trauma. Traffic accident is the major cause of femoral fracture in goats (Bini et al, 2014).

Metaphyseal and diaphyseal fractures are more common in mature animals, whereas proximal physal fractures are more common in kids (Bini et al, 2014).

Most femur fractures were observed as closed fractures because of the heavy adjacent muscle on top. The goal of fracture repair is to establish perfect alignment and inflexible fixation of the bone to allow both immediate and quick return to function of the broken bone. In the goat internal fixation is seldom applied because of the advanced and expensive methods such as plenty of diverse selection of implants (Bini joy and Syam, 2014). Femur fractures are commonly not liable to conventional treatment, and some kind of external fixation and internal fixation is needed. Essential elements must be encountered when dealing with treatment of femur and metacarpal fractures and these are; elegant surgical technique , conservation of regional soft tissues and their attachment to bone , reduction , proper alignment , adequate choice and application of internal or external fixtures and an acceptable postoperative care (Ramadan, 1994).

1.1.Bone fracture

Fracture is a great disorder in the bony continuity with or without fragment disintegration or disrupting movements. It is always accompanied by soft tissue tearing or rupturing such as torn vessels bruised muscles, ragged torn periosteium and injured nerve.

It may be accompanied by some internal organ involvement such as ruptured bladder in the pelvic fracture and slashed skin. The tearing of soft tissue must always receive more attention. (Slater,1995).The fractures are usually due to crack or break of bone by direct external blow , however, the femur has the thickest muscular structure that reduce these forces when compared to any other bone in the body (Brinker eta,l 2015).

1.2. External fixation:

Fastening is the oldest method of fracture fixation; it is until now is used in orthopedic surgery (Hickman 1964). These splints are made from different materials such as the aluminum sheets, x-ray film, palm wood, arjun plam and recently fiber glass (Debowes, 1993)

1.2.1. Plaster of Paris (Gypsum):

It is a mineral solid crystalline which hardens when exposed to warm water and applied with a gentle pressure (Hurov,1968).

1.2.2. Modified Thomas splint:

These are used in large animals for radial and tibial fractures that are not liable to cast application alone.

1.3. Internal fixation:

Is an operation in orthopedic that involves the surgical implementation of implants for fixation of bone fractures. An internal fixation is made of stainless steel or titanium .It has the advantages of good alignment, no muscular atrophy and animal's especially dogs can not remove them because they are deeply buried inside the body.

Examples:

Intramedullary pins, Kurnchrer nails, Rush pins etc ... (Ramadan,1994).

Chapter two

Materials and methods

2.1. Animals: animals were purchased from Alseilate Alzeireeba market nearby to the university veterinary hospital (Alseilate). The goats were given ivermectin(sc) dose rate 1ml for every 50 kg body weight for control of parasite (shanghai Gengyl veterinary medicine plant) and as a deworming. The dose was repeated after a short duration. The goats were fasted from food for 12 hrs and allowed free access to water.

2.2. Anesthesia:

Goat No1: was given xylazine manufactured by Laboratories Calier(Spain).The needle was filled with about 2ml and then emptied back in the vial, washed with normal saline and injected immediately(iv) with the saline containing very minor trace of the original drug,ketamine (Troika Pharmaceutical India) (iv) at a dose rate of 1mg for 1 kg body weight. Antibiotic (Betamox, NCPC, China) was also given after operation at a dose rat of 7 mg for kg (im). Phenylbutazone at dose rat 5mg for kg (Phen XLject interchemie werken DeAdelear) (im).

Goat NO2: The goat was given diazepam ,5mg for kg(valium) (iv), (Cenexl SAS Fontenay – SOUS – BOIS ,France) lidocaine 20 ml(sc) (INDOCO REMEDIES LTD. INDIA).

Sterilization and disinfection was carried out according to the available facilities using iodine after clipping and shaving of the hair.

Sterilization of the instruments by using Electric heated vertical steam sterilizer (model LX B50 L, made in china, working volt AC 220 V, power 2.5 kilowatts),temp 126 °C pressure 0,165mpa, Ne wGt 42kg, volume 0,05m³.

Other tools used: a pair of nail clipper, a hammer, Door hinge as internal fixation pointed slender nails and headed fastener designed to be pounded in. External fixation (EØ3, 5mmX150mm,316L,Ø4X200mm CE.)

2.3. METHODS:

Goat NO1: The goat was positioned on the right side on the operation table after anesthetized (see materials) the metacarpal bone was fractured , recycling water pipes and the nails were used as external fixture ,the pipes were fenestrated on each side with (ATP crownNO10kg vanadium K din Germany impact drill,13mm,ct1006s).The nails were fastened to the pipes on each corresponding side tightly fixed using nail nuts.

Goat NO2: The same procedure was carried out using internal fixation; on the left femur using the scalpel creating a line incision extended high up to the midline of the back and down to the major trochanter down to the lateral condyle of the femur. The skin was incised over the diaphyseal part of the femur along the surgical line. The Biceps femurs muscle was incised to expose the femur. Part of the adductor muscle attached to the posterior part of the femur was separated. The fracture was carried with gigli wire saw .The pins were driven inside through the hole on the door hinge on each side of the fracture .

Procaine penicillin powder was sprayed on the incision area then the muscles closed by simple continuous suture using absorbable suture (cat gut no2/0), and the skin was sutured with vertical mattress stitches using (no2/0) surgical silk.

Post operative doses of Amoxicillin injected 1mg for9kg (im) for five days.

Chapter three

Results

3.1 Goat No (1):

Goat was positioned laterally on the right side a fracture was induced on the left metacarpal bone, the water pipes were fenestrated as described(by the impact drill),

the nails were fastened in to meet the other pipe and tightly fixed by nail nut to immobilize the fracture ends (figur1). Complete reduction was achieved. The goat was given antibiotic (5ml) of Amoxicillin (im) for five days, (see methods).

The initial heart rate was (30beat/min), during the fracture it jumped to (60b/min).

It resumes to a value of (34b/min), and then an increase to (56b/min) one hour after the fracture was induced.

Temperature during the whole process ranged from $37c^{\circ}$ to $38.7c^{\circ}$.

The respiratory rate initially was 20breaths/min, dropped to 16 breath/min and remained at a rate of 19brth/min to the rest of the whole process.

It is worth mentioning that this particular animal showed a rise of temperature and started to wake from Anesthesia 2hrs (Ketamine hydrochloride and Xylazine combination). The goat suffered from bloat and trochar and canula applied. The first attempt of the fractured limb for weight bearing was noticed 4 hours and a half from the start of the operation.

Despite all the best care (phenyl butazone, glucose...Etc). This case lived for 24hours, the next day the nails and pipes were still intact. The owner was investigated later he told us that the goat was born under weight and we believe that the immune system was compromised and the goat suffered from shock.

3.2. Goat No (2):

The goat was positioned on the lateral right side the door hinge was fixed as internal fixture left femure tightly fixed with four nails two on each side of the fracture ends (figure2). Eleven days

later x-ray picture revealed non union and movement of the door hinge and the nails .later on external fixation was applied (EØ3, 5mmX150mm,316L,Ø4X200mm CE)(figure3). Commonly observed complications two weeks from the beginning of the external fixation were pin tract drainage. Transfixation pin passed directly through the fracture site without causing any delay in fracture healing.

In general: Premature loosening of pins due to inadequate patient restriction after surgery (using the door hinge) was noticed as a major complication. However, pin loosening in the present case using external fixation did not cause any difficulty to the animal since it started bearing weight by the third day, resumed semi normal gait and by the fourth week the implant was removed.



Figure1:goat no (1) external fixation.

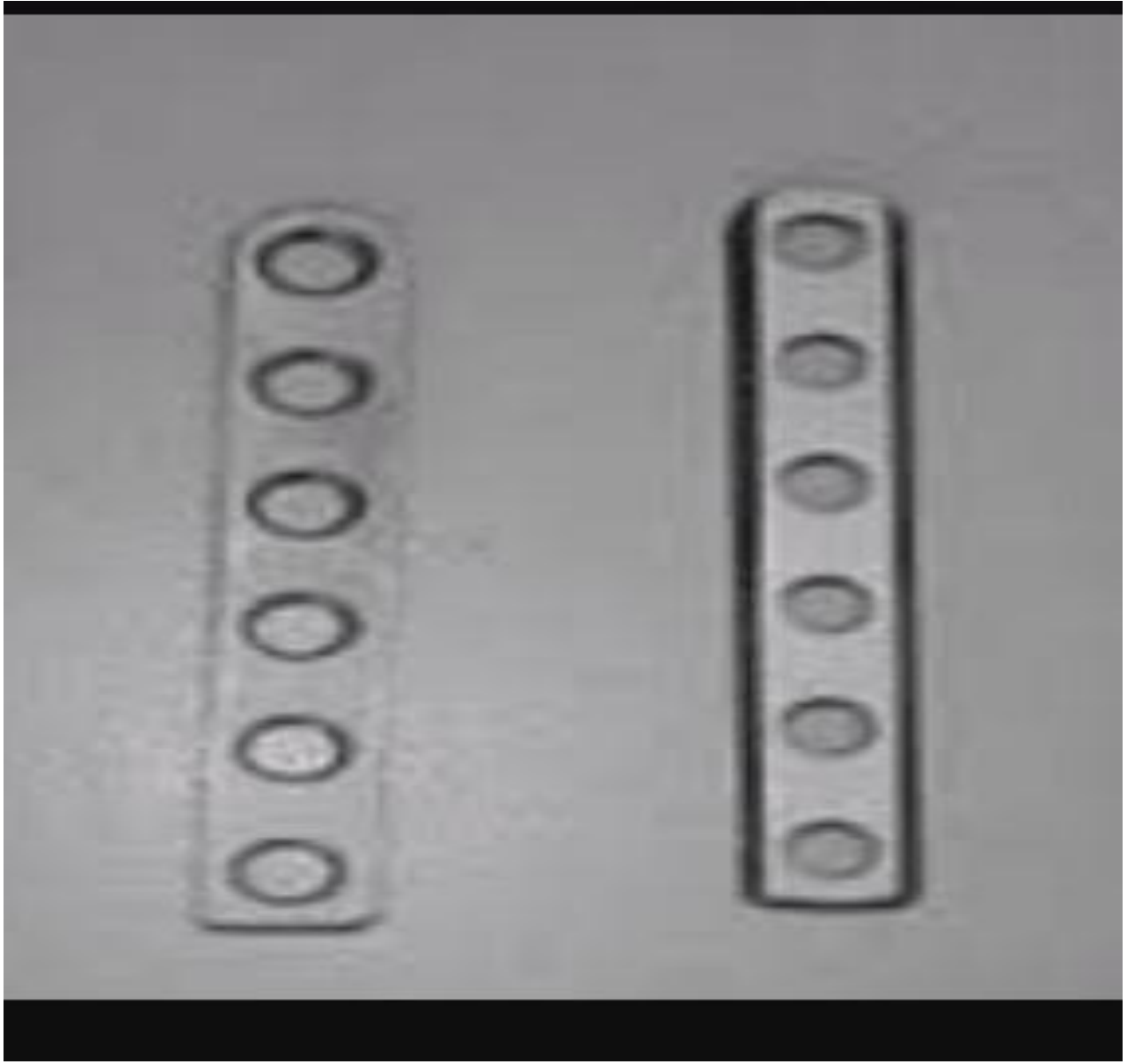


Figure2:goat no(2) internal fixation (Door hinge).



Figure 3:goat no (2) external fixation (Pin tract draining).

Chapter four

DISCUSSION

The present study has shown clearly that external skeleton fixation has many advantage over the internal fixation for fracture management in animals .It is therefore agrees with the results of Bini etal, (2014).

The beneficial advantage in its application made it easier for its use in all kind of fracture such as open, closed simple... etc, with more stability and less complications. It can also be used in treatment of infected bony condition. Its simplicity and easiness of application suggests its use in veterinary surgery. However, the technique is not wholly without disadvantages such as pin tract drainage and pin loosening. This was also reported as premature loosening of pin due to inadequate patient restriction, the inquisitive nature of the goat itself adds to such complications and increases the disadvantages.

In general other worker reported the use of many external and internal fixations which were used to immobilize fracture in the goat. Some reported internal splints as preferable method such as intramedullary pins and bone plates (Ramdan , 1994).

Chapter five

Conclusion and Recommendation

The reason for the osteoporosis and pin tract drainage is not clearly understood under the very restrict sterilization technique further work is eminent to investigate the inflammatory process, as to what sort of pathogenic bacteria or any other organism caused the bone lyses .This also suggests a very standard method of control such as (iv) antibiotic cover from the start, and all through the whole process. Isolation and identification of the pathogenic bacteria by carrying the most effective method of obtaining accurate culture from the pin drainage infected pocket ,bone biopsy and hence the sensitivity test to control the infection which leads , in our opinion , to a better healing of the fracture without noticeable complications (Ramadan ,1994).

A neuromuscular blocking agent is known to aid fracture repair to a great deal (as an aesthetic agent) ,phenylbutazone is used as analgesics and it is the only drug in hand , the facilities in the future may permit the use of such valuable neuromuscular blockade. Due to less oxygen in the cell anaerobic glycolysis might had happened ,as a result of which lactate production may leads to the acidosis and therefore increases the dissociation of certain of most of the anesthetic and a prolonged recovery or very deep anesthesia beyond the surgical anesthesia and leads to further complications .It is indeed very important to monitor the level of the blood gases and remove the accumulated carbon dioxide (CO_2) and ventilate the animal by giving oxygen to avoid the above drawback , again the facilities we have dose not encourage such precautions (Bini , etal,2014).

We also wanted to encourage and consider the veterinary practioner as a user of this information.

Type of complication, in relation to various species, that the practioner might encounter .it was further important to consider the study for a better understanding of veterinary orthopedics and as a part of training program for the students and other people in concern.

Finally we anticipated that some readers would be using the study in research projects in veterinary medicine or at medical centers. As a result this humble attempt was made to organize

the study to provide an opportunity for each of these segments of the clinical practice to use the material as it applies to their needs.

- Internal fixation must not be used for treatment of femoral bone fracture in goat.
- Restriction of movement of animal before healing to avoid the non-union of the fractured bone.
- Must be consider the health state of the goat before start the operation to avoid shock.
- Give the goat supplement of vitamin D , calciume and protein in their deit during healing of fracture.

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Trauma in a Turtle-Diagnosis and treatment

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Abstract

The study was performed on a clinical case of a reptile animal, a turtle which was presented with leg carrying lameness on examination, the turtle had trauma on the right hind limb with dark red and swollen thigh muscle. X-ray picture revealed without bone fracture and it was treated by broad spectrum antibiotic and pain killer with carefully cleaning of wound.

Key words:

reptile, turtle, shell, truma

الخلاصة

كانت الدراسة على حيوان برمائي، سلحفاة والتي أظهرت عرج في القائمة اليمنى مع زيادة في درجة العرج (جرح) أدى الى ظهور بقعه محمّره مع انتفاخ (عند التحميل على القائمة المصابه وعند الفحص كان هناك كلم في العضلة المتاخمة. أظهرت الصورة بالاشعه السينية عدم وجود كسر بالقائم وتم علاجها واشتمل على مضاد حيوى واسع الطيف ومزيل للألم مع نظافه الجرح بعناية فائقة.

الكلمات الرئيسية:

برمائي، سلحفاة، غطاء، كدمة.

Introduction

Turtle, a reptile of the order chelonian, with strong, beaked, toothless jaws and, usually armor like shell. The shell normally consists of bony plates overlaid with horny shell. The upper portion, or carapace, covers the turtles back and sides, and the lower portion, or plastron covers the belly(George,1997).

Turtle speciese:

There are hundreds of different types of turtles, such as:African Side neck turtle, Alligator Snapping turtle, Box turtle, Musk turtle, Reeves turtle....etc.

Case history:

Thirteen years old female turtle weighing (30 kg) was presented to the university veterinary educational clinic (Alseilate) 28th of April 2016. The lady owner expressed annoyance and unhappiness that the patient had leg carrying lameness after being exposed to unknown trauma.

Clinical signs:

Clinical examination revealed trauma on the right hind limb, pointed out by dark red and swollen thigh muscle.

The tortoise perceived great serious pain when the affected part was touched. Examination of the area displayed no crepitation, and an abnormal size and shape of the affected part. The patient showed leg carrying lameness.

No further mention to this particular case. But it is still carrying happy life with Dr-GehanAbdalla after being donated by the lady owner Mashaer Hassan Ali Aboud and her husband Abu Baker Mohamed Ahmed Ali.



Turtle with Trauma in leg

Diagnosis and Treatment:

Diagnosis by palpation and clinical signs (trauma on the right hind limb, dark red and swollen thigh muscle, great serious pain and lameness).

The turtle treated accordingly and given antibiotic treatment, and pain killers, antiseptic cleansing of the wound was carried out using povidine iodine 1% and the patient discharged.

Discussion:

Tortoises are long lived species, anthropogenic impacts, such as land development, climate change or road traffic challenge the success of life history strategies of tortoises (Loehr, 2007).

Traumatic injuries are usually apparent during physical examination, but radiographs should be taken to look for further bony injuries and to assess the nature of the injury. The general health of the animal prior to any injury, and concurrent disease that may affect the healing of an injury will also need careful assessment. Reptiles in pain will benefit from analgesia and possibly even anaesthesia prior to handling. Haemorrhage and fluid loss should be assessed and the patient stabilised before significant surgical intervention is considered (Scott and Swingle, 2004). In present study the tortoise reveal trauma on the right hind pointed out by dark red and swelling of the muscle which treated by cleaning of wound using povidine iodine and give antibiotic this agree with result of (Mitchell and Diaz, 2004).

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