CHAPTER TWO

MATERIAL AND METHODS

The work described in this thesis was carried out at the Department of Clinical Studies, College of Veterinary Medicine and Animal Production, .Sudan University of Science and Technology

:Animals 2.1

Twelve healthy desert goats (6-12 month age) of 20-30(Kg. b.w) were used. All animals were examined clinically and kept in pens within the premises of the College of Veterinary Medicine and Animal Production, Sudan .University of Science and Technology

2.1.1 Ethical considerations:

All procedures were conducted following approval by the Research Committee, and in accordance with The Animals Scientific Procedures Act (ASPA) 1986.

All experiments were designed with consideration of published guidelines (Kilkenny et al., 2010, Festing and Altman, 2002).

((**Splints:** ((Camel metacarpal bony shuttle pins **2.2.**

Round pins were made from metacarpal bone of healthy and freshly Slaughtered camel. The bones were cleaned properly and cut with an electric saw into proper width slats, and then with an electric grindstone. Different sizes of pins were made with notch in one of its ends. The bony .Shuttle pins were wrapped in papers and autoclaved for 30 min. at 121ċ

Pins of different lengths and diameters were sterilized and some of these Splints were re sterilized many times and kept in a closed surgical drum .ready to be used

2.2.1 Materials, surgical instruments and medicines

A list of materials, surgical instruments and medicines that were used as part of the surgical procedure are detailed in **Table 1.**

Table 1. List of Materials, surgical instruments and medicines

Surgical instruments	Materials	Medicines
Needle holders	Bony pin splint(Camel metacarpal bone)	lidocaineHcl 2%
Surgical needle	Sterile Surgical sponge	Procaine penicillin 1,000,000 I.U
Scissors	Absorbable suture	
Blunt forceps	Non absorbable suture	
Toothed forceps	Syringes	
Bone forceps	Surgical towels	
Bone cutter	Surgical Gloves	
Tissue forceps		
Haemostatic forceps		
Gracping forceps		
Retractor		
Scalpel blades		
Blades		
Gigle wire		
Electric saw		

(The procedure: (operation 2.3

.Anesthesia and control – 1 .2.3

All operations conducted under epidural analgesia using 2%lignocaine (lidocaine*) hydrochloride at the dose of 0.45 mg/kg body weight, .injected at the lumbosacral space

.Surgical approaches to the femur - 2.3.2

The preparation of the surgical site was extended high up to the midline .(of the back and down to the distal third of the Tibia. (Fig.6

The animals were positioned laterally on the surgical table on the .opposite side and restrained

The prepared leg was covered with thin layer of cotton impregnated with .alcohol

The surgical line extended from the major trochanter down to the lateral condyle of the femur. Skin was incised over the diaphyseal part of the femur along the surgical line. (Fig.7). Then, the fascia lata was incised as close as possible to the anterior border of Biceps femoris muscle .((Leonard, 1988

The Vastuslateralis and Biceps femoris muscles were retracted to expose (the femur. (Fig.8

Fig.6 Surgical site preparation

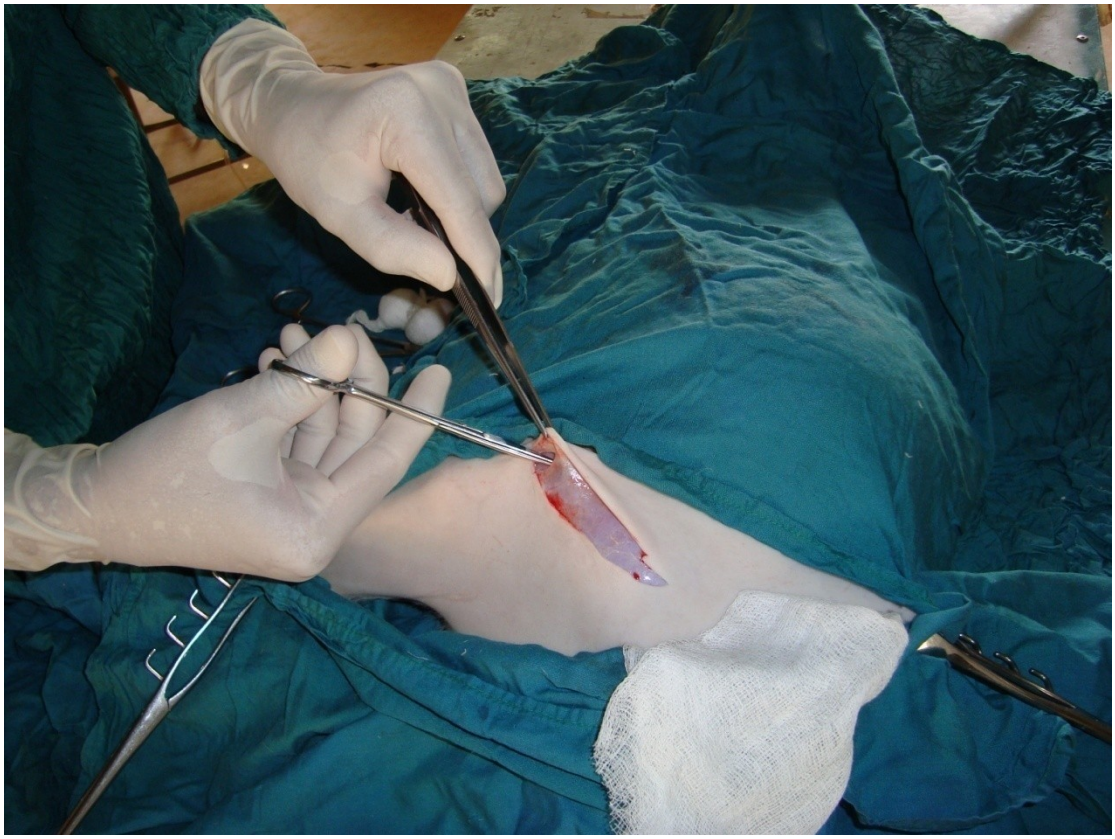


Fig.7 Skin was incised over the diaphyseal part of the femur

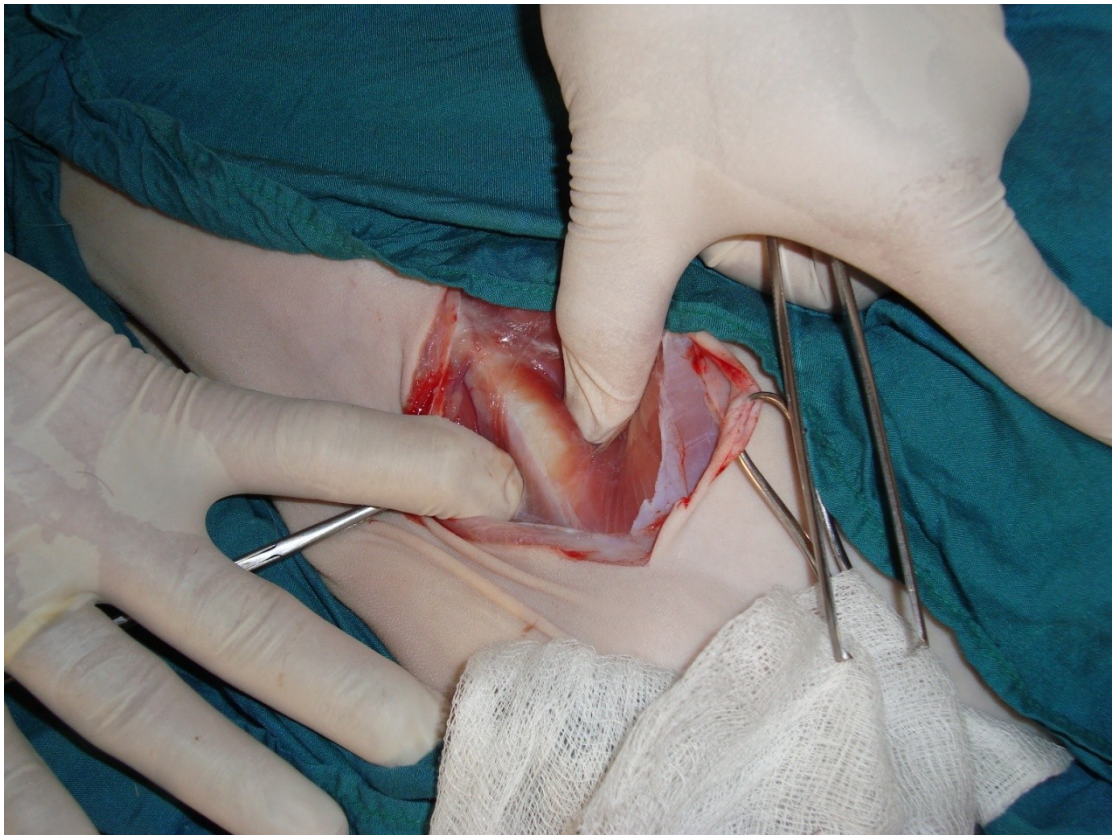


Fig 8. Vastuslateralis and Biceps femoris muscles were retracted to .expose the femur

Part of the adductor muscle attached to the posterior part of the femur was separated to pass two long curved scissors under the femur, one opposite to the other and kept open to protect the underlying structures from being injured during induction of diaphyseal partial fracture. This was started with gigli wire saw and then completed with a heavy tool to .(produce an uneven fracture (Fig 9

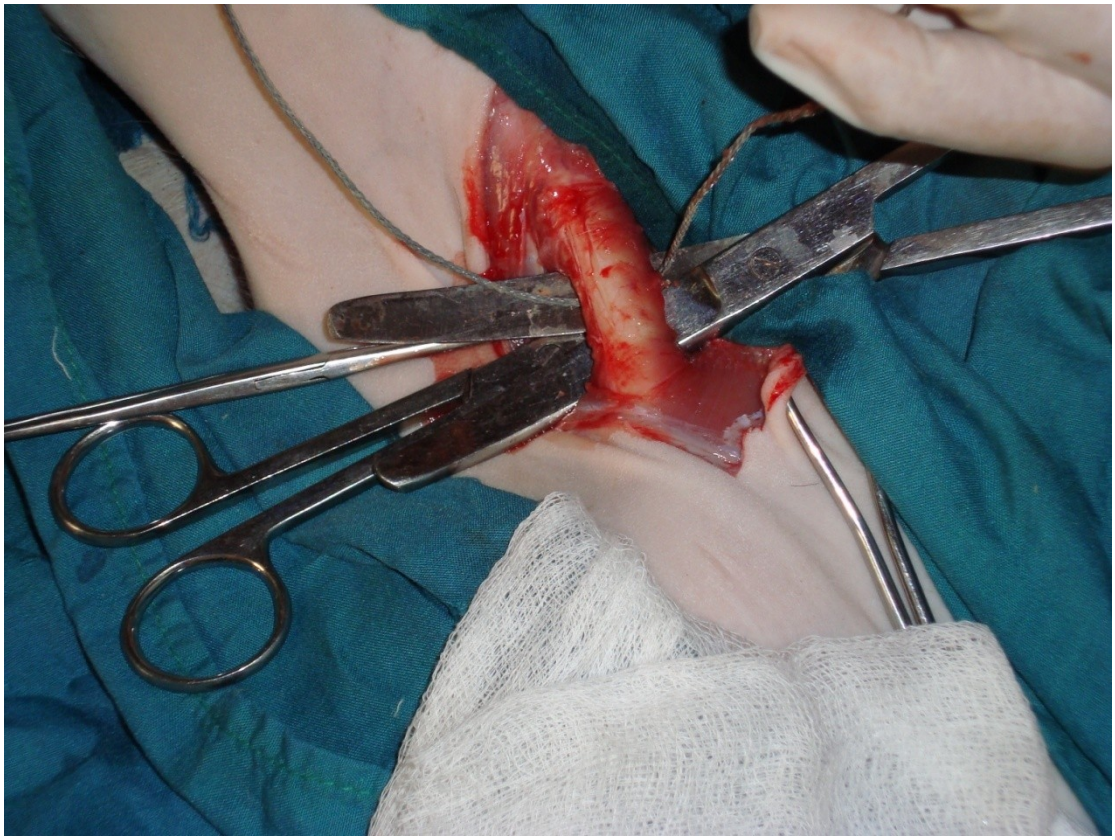


Fig 9. Two long curved scissors passed under the femur to Induce .diaphyseal femoral fracture with Gigli wire

After choosing the proper size and length of the bony pin reaming of the .(proximal and distal segments of the femur was performed (Fig 10

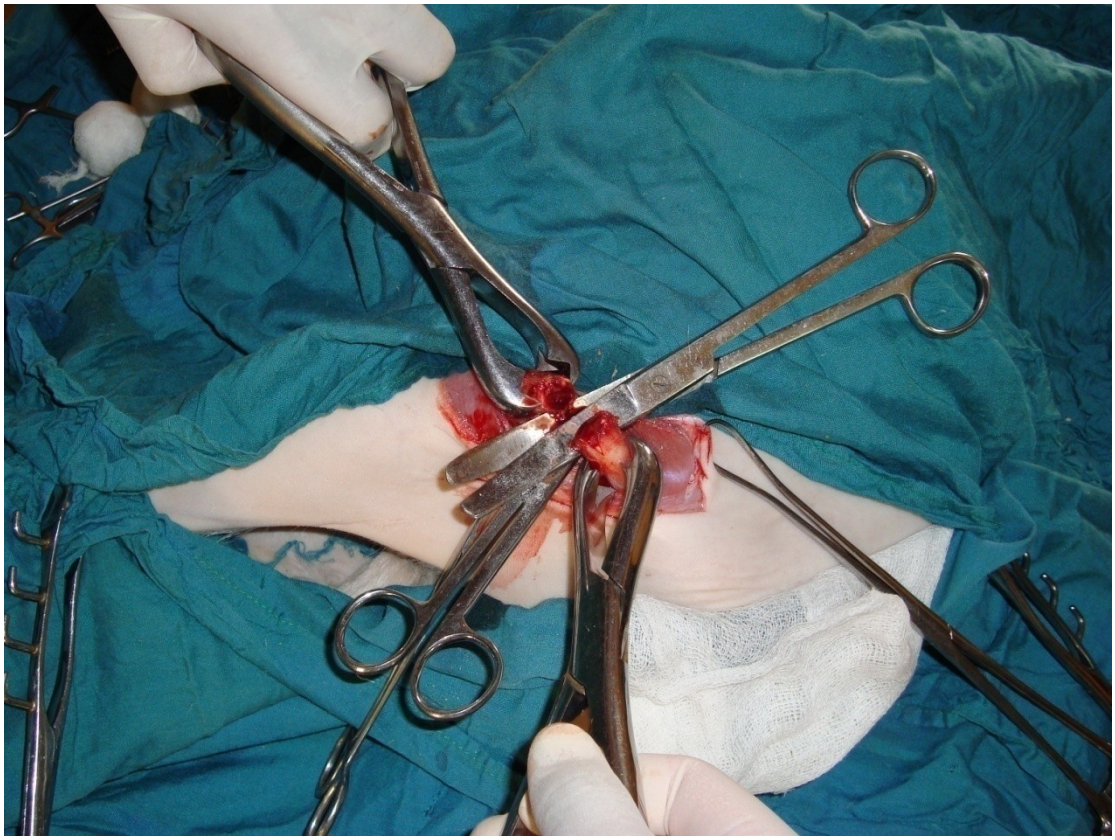


Fig 10).Proximal and distal segments of the femur)

Bony pin was hocked with no 1 nylon thread, held with an artery forceps and then introduced into the proximal segment to about a few

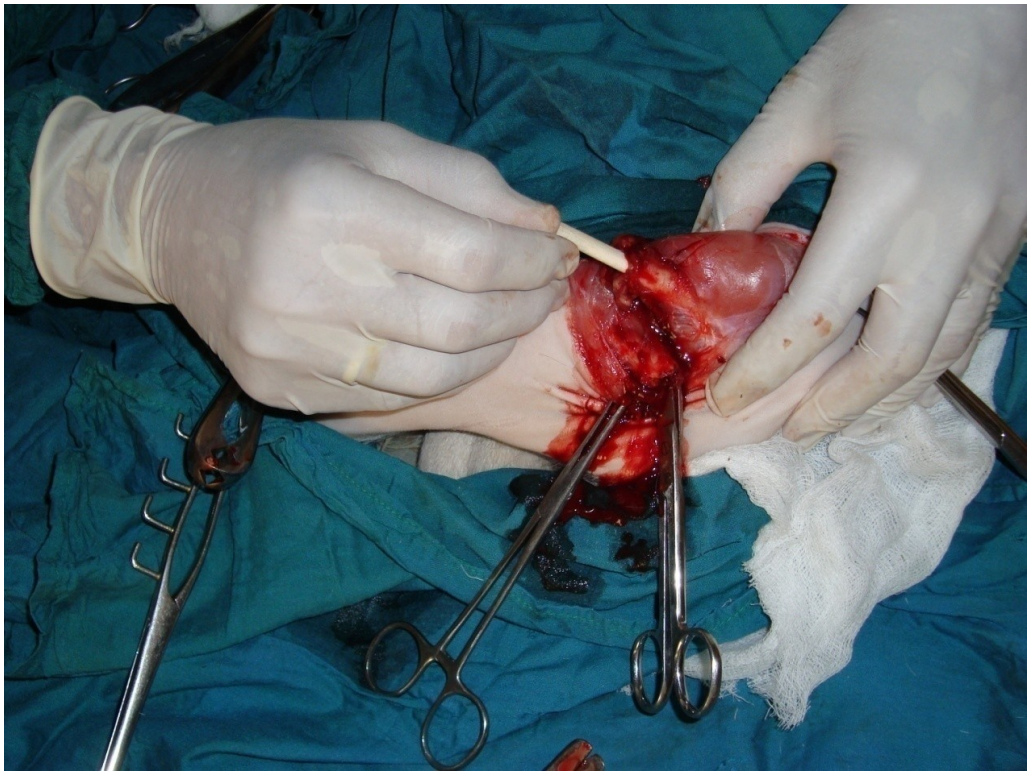
Millimeters of the bony pin appears out of the proximal segment(Fig 11), Then reduction and alignment of the fractured femur is done, pin is pulled into distal segment to about half of its length estimated from the nylon thread which is hocked into the notch of the bony pin and signed with the .artery forceps

Procaine penicillin powder is sprayed on the fractured area, then the wound closed by simple continuous suture using absorbable suture

cat gut no 2/0) to approximate the fascia lata, and the skin was sutured) .with simple interrupted stitches using No 2/0 Surgical silk

Postoperative doses of Procaine penicillin were used intramuscularly for .five days

Immediate postoperative mobilization and weight bearing was allowed as .soon as it is tolerated by the operated animals



.Fig 11 .Insertion of the pin

Radiographs 2.4

Lateral radiographs (50 Kv, 0.2 Sec, 0.8mAs) of the fractured femur were made after the operation and then at (2, 4, 6, and 8) weeks intervals. Then the healing process and the possible reaction to the shuttle-splints were monthly followed-up for a period of one year.

3. Blood analysis

Three milliliter blood samples were collected from the external jugular vein from each goat using (EDTA) vacutainer tubes. These samples were submitted to laboratory for the hematological analyses.

Erythrocytic indices were determined according to the methods described in Schalm's Veterinary Hematology (Jain, 1986). The packed cell volume of erythrocytes was determined by the micro-haematocrit method using a special centrifuge. Haemoglobin concentration was determined by the cyano- methaemoglobin method as described by Van kampen and zijlstra (1961).

Differential leukocyte count (DLC) was determined microscopically from a count of 100 leukocytes in thin May-Giemsa stained blood smears (Kelly, 1984).

.Bone marrow examination .4

Multiple slides prepared for special stains or techniques. Imprints of femoral marrow were collected and placed in EDTA/physiologic saline. When marrow granules have been obtained, crush preparations prepared by flattening and spreading the marrow flecks between two glass slides to produce a smear