Rush Pin Method For Fracture Os. Femur And Luxatio Reposition Of Caput Femur in A Cat at DNA Animal Clinic Bogor

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Abstract. Fracture is the severity or destruction of bone continuity and the type of extent that usually caused by trauma. The aim of study was to application rush pin for fracture os femur and reposition of luxatio caput femur. Examination methods used to make the diagnose were physical examination, radiography and and cell blood count test. The radiography result showed that transversal fracture distal os. Femoiris and luxatio caput femur, the result of CBC there were no abnormality. Treatment for this case was surgery using the rush pin method to installing intermedulary pins (IM) in condylus os femur. It was used two pins with cross placement. Reposition of luxatio caput femur with simple interrupted suture to apotition the caput femur with ligament. After surgery cat was administrated with antibiotic, analgesic, and supplement to support the condition of the cat as post surgery therapy. The conclusion of this study is installation of pin can repair transversal fracture os femur, because rush pin keep the bone to right position better than single pin and luxatio caput femur was corrected.

Keyword: Fracture, luxation, Rush pin, Os. Femur

1. Introduction

Fractures are broken continuity of bone or cartilage whose causes can be due to bone loss including diseases often called osteoporosis, usually experienced at an adult age and can also be caused by unexpected accidents. Based on the structure of bone damage, fractures can be distinguished into: (a) Incomplete fracture which is characterized by the partial loss of bone continuity and only a few bones undergoing tissue separation. (B) Complete fracture is the complete separation of bone continuity where the fracture line can be single / single or can be multiple, for example in comminuted fractures. Based on the direction of the fracture, fractures can be divided into: Transverse fractures, oblique fractures, spiral fractures, longitudinal fractures. Clinical Symptoms Animals with femoral fractures show clinical symptoms, limping, swelling, anemia.
2. Case Presentation

The animal is a cat named Diablo, a domestic short hair cat with female, aged 6 months old, with blue tortie color. Diablo cats are referral patients from other clinics carrying x-ray results that have been interpreted as fractures on the os. femur and luxatio caput femoris.

![Figure 1: Radiography of Os Femur](image)

Supporting examinations carried out to obtain medical information or supporting to the results of physical examination, provide clarity related to the illness suffered by the patient, as well as assist in making it easier for doctors to determine the diagnosis because further examination can strengthen the results of previous examinations, in addition to further examination is also used to know functional or structural changes that have been shown by the patient or based on the patient's disease history.

3. Discussion

Supporting examinations carried out in this case include hematological examination to determine the blood panel. And X-ray investigations are carried out which aims to find out the exact condition of diablo’s bone.

| Luxaxio caput femur                  | Fraktur os. Femur       | Fisura os. Tibia            |
|-------------------------------------|------------------------|-----------------------------|
| • Suture with simple interrupted caput femur with ligament | • *Intramedullary pin* (rush pin) | • *Non surgical (bed rest)* |

Before going to surgery, animals should be fasted for 6-8 hours. The anesthesia is carried out in two stages, the first stage is pre anesthesia using Atropine Sulfate 1%, a dose of 0.02-0.04 mg / kg (IM), then allowed to stand for 15-30 minutes until the cat appears calm and relaxed. The second stage is general anesthesia using xylazine 1.1 mg / kg (IM) and ketamine ketamine 2-25 mg / kg (IM). The cat is immediately laid on the operating table on the left lateral recumbency. Then ETT and anesthesia inhalation machine were installed to record breathing, heart rate, and to maintain anesthesia using isoflurane. The area around the orientation is cleaned, the hair is shaved clean, washed with NaCl and soap, then washed with 70% alcohol. Throughout the Os. Femur, then mounted duk.

Before surgery, blood tests are performed to ensure the animal's condition is safe for surgery.

| Table 1. Complete blood count |
|-----------------------------|
| **Parameter** | **Hasil** | **NormNilai** | **Unit** |
| WBC            | 17.7      | 5.5-19.5     | $10^3 / \mu$L |
| Lym            | 2.3       | 0.8-7        | $10^3 / \mu$L |
| MID            | 0.8       | 0.1-9        | $10^3 / \mu$L |
| Gra            | 14.6      | 2.1-15       | $10^3 / \mu$L |
Lym 13.2  12-45  %
Mon  4.5  2-9  %
Gra  82.3  35-85  %
RBC  7.19  4.6-10  10^6 / µL
Hgb  9.2↓  9.3-15.3  g / dL
MCHC  32.3  30-38  g / dL
MCH  12.8↓  13-21  Pg
MCV  39.7  39-52  fL
RDW-CV  15.5  14-18  %
RDW-SD  30.7↓  35-56  fL
HCT  28.5  28-49  %
PLT  278  100-514  10^3 / µL
MPV  9.5  5-11.8  fL
PDW  10.6  10-18  fL
PCT  0.263  0.1-0.5  %
P-LCR  28  13-43  %

**Figure 2:** The distal and proximal os femur was incised

Selecting the pin and size that will be used looks at the x-ray results and considers the number of fragments. In this case only the intramedullary pin is inserted. Bone pin length is measured from the proximal (caput femur) to the distal (corpus) os. Femur The diameter is based on the size of the medulla os. Femur Based on the measurement results, the length of the bone pin used is 8 cm. [2]
The operation begins with the installation of a sterile drape and towel clamp, then an incision is made to the skin in the lateral thigh area. The incision is made parallel to the femur bone, with an incision about 5 cm long. After the skin part is opened, then the incision is continued in the muscular layers below such as M. biceps femoris, M. tensor fascia lata, M. vastus lateral, and M. adductor then uncovered just above the femur bone, this is done to minimize tissue damage.
Animals are laid on the operating table with a dorsal position. The location to be operated on is shaved and given povidone iodine. The incision is made in the femoral head region and the location of the fracture. The skin in the preparer reaches the joints

**Figure 3.** The distal and proximal os femur was opened and ready to reposition
After opening using the retractor, the distal femur is targeted to find the fracture that occurs. Once found, the incise position is held to remain above the fracture position. Before suturing, repositioning of the head and distal femur bone. Suturing the femoral head with a ligament serves to maintain the head so that luxaxio does not occur again, suturing using poliglatin.Os femur which is fractured, the distal portion is explored, removed and held. Sterile bone pins are inserted into the medulla (bone marrow) os. femur part of the proximal fracture. Use two bone pins to check the insertion length of the pin using the second pin as a reference and can estimate the position of the proximal and distal ends of the os. the femur. So that it can be seen how long (in cm) is needed for both sides of the fault if combined with a pin (pin length to be installed

Figure 4. Instaling Intramedulary pin (Rush Pin)

Os femur which is fractured, the distal portion is explored, removed and held. Sterile bone pins are inserted into the medulla (bone marrow) os. femur part of the proximal fracture. Use two bone pins to check the insertion length of the pin using the second pin as a reference and can estimate the position of the proximal and distal ends of the os. the femur. So that it can be seen how long (in cm) is needed for both sides of the fault if combined with a pin (the length of the pin to be installed in the femur os. Both pins are crossed to form a cross pin.

Figure 5. Sutured and bandaged

The bent pins are intended to hold or put pressure on the bone, because active cat patients require a technique to secure the pin to keep it in a fracture position. [3] The closure of the thigh area by suturing the muscles, subcutaneous and skin. The type of stitches used in the first layer muscle is m. The tensor fascia lata shown in the image and the muscular layers of the second lateral femoral fascia, and subcutaneously are continuous simple using polyglatin threads with round type needles. Whereas the suturing skin is carried out using nylon 3.0 thread with cross stitch type with taper needles.
Figure 6. Radiography imagine after surgery

X-ray aims to determine whether the pin and bone position are correct, the X-ray results are intended that the rush pin has formed a cross pin and the position is correct [4]. In post-treatment, several drug therapies are given, namely antibiotic, analgesic and supplements. Antibiotic as Cefat or cefadroxil is a broad-spectrum antibiotic which is the first generation of cefalosporin which is usually bactericidal and works by inhibiting cell wall synthesis. This antibiotic is very good for dealing with gram-positive bacteria. Cefadroxil oral administration in cats, the half-life is three hours. And analgesic as tramadol [5].

4. Conclusion
The conclusion of this study is instalation of pin can repaair transversal fracture os femur, because rush pin keep the bone to right position better than singgle pin. And luxatio caput femur repocition with simple interrupted suture with polyglatin.

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