CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES

Volume: 03 Issue: 08 | Aug 2022 ISSN: 2660-5317
https://cajotas.centralasianstudies.org

Dynamics of X-Ray Status After Osteosynthesis in Dog Fractures of Injury Bones

S. A. Haydarova
The main doctoral student, Samarkand State University of Veterinary Medicine, Animal Husbandry and Biotechnology

Ph.D, B. D. Narziev
Associate professor, Samarkand State University of Veterinary Medicine, Animal Husbandry and Biotechnology

R. M. Tashtemirov
Professor, Samarkand State University of Veterinary Medicine, Animal Husbandry and Biotechnology

Received 24th Jun 2022, Accepted 22nd Jul 2022, Online 25th Aug 2022

Annotation: *This article describes the progression of the radiological condition of the fractured bone following osteosynthesis surgery in 18 dogs with tubular bone fractures of various etiologies that belonged to inhabitants of the Samarkand region and city.*

Keywords: *Intramedullary osteosynthesis, plate osteosynthesis, mummy, osteogenon, fibrous tissue, osteoporosis, osteomyelitis, pereoste and endoste reactions.*

Introduction. There are significant limitations to both conventional (gypsum splints) and surgical (intramedullary and supraosseous osteosynthesis, mono- and bilocal implants) methods of treating bone fractures. Such structures do not provide satisfactory fixing of a short distal piece during osteosynthesis. In addition, when the bone development zones are harmed by pins piled together, puppies have numerous deformations and joint dysfunctions. A less traumatic method of fixing fractures and an early loading of the injured limb with body mass is provided by closed intramedullary osteosynthesis [1].

To guarantee that osteosynthesis is utilized to treat bone fractures successfully and without problems, a variety of tools and contemporary materials are employed. [5].

Leg curvature, functional disability, pathological movement at the fracture site, and other negative effects might result from improper bone end fusion. Osteosynthesis is the surgical realignment and fixing of bone fragments using different immobile components. In intramedullary osteosynthesis, the bone is drilled using a specific pin or spike. A less traumatic method of fixing fractures and an early loading of body mass onto the injured leg are provided by closed intramedullary osteosynthesis.

It is still vital to find the most minimally invasive fixing approach for broken bone fragments. In human medicine, X-rays or computer navigations are employed. [3].

Numerous studies have shown that the condition of osteogenic tissues [2] and the blood supply to the injured area affect the activity of regenerative processes in damaged bone, and as a result, their maximum preservation, accurate repositioning, and stable fixation aid in the earlier restoration of bones [6, 7].

Broken bone therapy using conventional techniques and equipment frequently cannot stop the emergence of numerous problems. On the basis of this, it seems sense to continue researching the reparative processes that help fractured bones recover, as well as to look for novel materials and therapeutic approaches. [4].

The purpose of the study. Following the surgical osteosynthesis procedure, the radiological state of the fractured bones is examined during the subsequent therapy according to a specific plan for dogs with fractures of the tubular bones that are common to the community.

Materials and methods. Experiments were carried out on 18 dogs with fractured tubular bones of various etiologies belonging to the residents of Samarkand region and city. Dogs were divided into 2 experimental and 1 control groups (6 heads each).

After intramedullary osteosynthesis, dogs in the first experimental group received special treatment as follows: for 25 days, calcium gluconate preparation from 1 tablet was given every day for 10 days, and for 10 days, lincomycin 1.0 ml was injected twice between the muscles (0.5 g) Mumiyum tablets (0.2 g) were broken and mixed with 5 ml of water twice daily for 15 days, and for the same amount of time, 5 drops of Aquadetrim (vitamin D3) 15,000 ME were combined with feed once daily.

Dogs in the second experimental group received one tablet of calcium gluconate preparation and two intramuscular injections of 1.0 ml of lincomycin every ten days (0.5 g) Osteogenon preparation 0.85 g 1 (1 /2) taken orally twice daily for 25 days, 15000 ME medication Akvadetrim (vitamin D3) 5 drops combined with meal once daily for 15 days.

Dogs in the control group received Aquadetrim (vitamin D3) 15000 ME formulation 5 drops once daily for 15 days added to the diet, calcium gluconate 1 tablet (0.5 g) twice daily for 25 days, and lincomycin 1.0 ml twice daily intramuscularly for 10 days.

Regular clinical evaluations were performed on all experimental canines. The osteoreparative processes were assessed using the X-ray examination approach. Images of the animals' shattered legs were taken before surgery as well as on days 10, 20, and 30 after it. A digital X-ray machine from Dk-Medical-Systems-Co., Ltd. (AccuRay-Series) was utilized to carry out this procedure (current 125 mA, voltage 0.44 kV, exposure 0.6 s). The state of the periosteum, the density and uniformity of the regenerate, and its existence were all examined. They were used to draw a judgment regarding the length of fractures. Radiography was done on days 15, 25, 35, and later depending on how long the healing stages took to complete.

Research results. In accordance with the kind of fractures, osteosynthesis surgery was carried out during the studies on the fractured legs of the dogs in all three groups, and X-ray tests were conducted following the procedure. As a result, on the second postoperative day, radiographic assessment of the dogs in all three groups revealed that the pins or plates inserted into their fractured bones had produced an ideal reposition and that there had been no periosteal response in any of the groups on that day.

CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCES
Volume: 03 Issue: 08 | Aug 2022, ISSN: 2660-5317

Figure 1. Radiographic image of a fractured bone in a control dog on day 30 of the experiment

The dogs in the control group had the following changes in the area of the fractured bone on the fifteenth day of treatment: there was a fibrous tissue wrapping process visible in the location of the fracture, and the space between the bone pieces was noticeably wider and distorted. Later, by the experiment's 25th day, there was inflammation in the porous bone tissue, a condition of local osteoporosis, absorption of fibrous tissue, and elevation of the periosteum. The border of the "porch" in the periosteum was also unclear. It was discovered that in certain dogs, the angular elevation of the periosteum in the inflamed area is ambiguous, and the boundary of the thin membrane in the metaphyseal area is in an unknown state. There were tissues lacking a homogenous structure seen in the X-ray scan. In this instance, the bone itself develops a harmful condition. Longitudinal, superficial, and deep flaws developed, disturbing the periosteum's normal look (smoothness, boundary). The shattered bone had a sequestral region with destructive modifications and a condition of widespread osteoporosis, it was discovered at the conclusion of the experiment. After the experiment, a few of the dogs in this group had osteomyelitis.

X-ray tests were performed while the dogs in the first experimental group were receiving therapy. The packing of the broken bone was found to be successful on the fifteenth day of the experiment, as evidenced by the blurring of the X-ray line where the bone pieces were being joined. The bone marrow chambers of the pieces that protrude are a clear indication of the endosteal response.

Figure 2. A pin inserted into a broken femur in a dog (gr. 1, day 15 after surgery)

The experiment's endosteum, periosteum, and bone tissue formation on the 25th day show that the packing process is quickening. The initial notex-thickened portion of the packaging was seen to have been smoothed out (a clutch-like appearance was formed). The effectiveness of the medication was seen in the dogs in this group. After the supporting movement had fully recovered, the pins inserted into the broken bone's channel and the plates affixed to the bone were withdrawn (on 25-27 days). In this group of dogs that had their fractured bones repaired, complications including osteoporosis and osteomyelitis were not seen in the shattered bones.

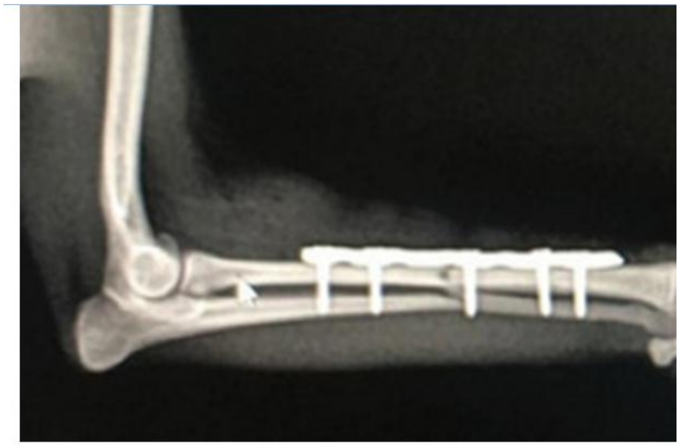

Figure 3. A plate placed on a broken carpal bone of a dog (group 2, day 15 after surgery

The pin that had been put into the fractured femoral canal was correctly positioned in the X-ray pictures of the dogs in the second experimental group on the fifteenth day of the trial, however the X-ray line showing the fusion of the bone fragments was blurry. In the field of refraction, rough shadows with varying optical densities were seen. The endosteal response was faintly expressed and found at the extremities of the fragments in the projection of the bone marrow cavities of the fragments (fragments). It was noted that the level of bone packing was good and there was a periosteal response in the dogs of this group. On the 25th day of the experiment, it was seen that the joint line of the fragments was apparent on the X-ray picture, which was obscured by the same shadows, and that the periosteal layer of the fractured bones was slightly elevated on the re-dynamized image. This scenario shows that the pack of dogs' reproductive activity is still ongoing. Although the therapy has outstanding results, it has been noted that the regeneration process is a touch sluggish. There were no indicators of osteoporosis found.

Conclusions.

1. On the 25th day of the experiment, an X-ray analysis reveals that the formation of endosteal and periosteal tissues in the dogs of the first experimental group suggests that the packing process is speeding.
2. The dogs in the first experimental group didn't develop osteoporosis or osteomyelitis throughout the studies, and this condition is linked to the activating action of the mummy medicine given to dogs with fractured tubular bones.
3. The second experimental group's canines' regeneration process was seen to be a little slower, but problems like osteoparosis and osteomyelitis were not seen.
4. At the conclusion of the trial, some dogs in the control group got osteomyelitis in the region of the broken bone.

References:

1. Ерофеев С.А., Петровская Н.В. и др. Чрескостный остеосинтез при переломах дистального отдела предплечья собаки Государственное научное учреждение - Российский научный центр восстановительной травматологии и ортопедии им. Илизарова, М.,2004.-С. 158-160.
2. Сахно Н.В. Остеосинтез при косых переломах с применением интрамедуллярного фиксатора и без него / Н. В. Сахно // Ветеринарная патология. – 2007. - № 1 (20). - С. 144-147.
3. Соломин Л.Н. Основы чрескостного остеосинтеза аппаратом Г.А. Илизарова. – СПб.: ООО«МОРСАР АВ», 2005. – 544 с.
4. Стекольников А. А., Решетняк В. В., Бурдейный В. В., Искалиев Е. А. Динамика белой крови при переломах бедренной кости у крыс на фоне применения иммуномодулятора РВ-2 и биокомпозиционного материала РВИ. Международный вестник ветеринарии. 2019; 4: 147–152. eLIBRARY ID: 41559298.
5. Хабаров А.К. http://www.vetkentavr.ru /from-practice/iz-praktiki/perelom-luchevoj-kosti-u-sobaki-so-smeshcheniem-i-obrazovaniem-lozhnogo-sustava/ 2018.
6. Fleming B. A biomechanical analysis of the Ilizarov external fixator / B. Fleming et al // Clin. Othop. - 1989. - Apr; 241. - P. 95-105.
7. Paley D. Problems obstacles and complications of limb lengthening by the Ilizarov Technique / D. Paley // Clin. Othop.- 1990. - № 250. - P. 81-104.6

