

# OPERATIVE TREATMENT OF BONE FRACTURE WITH KIRSCHNER WIRES – YOUNG CAT CASE

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## Introduction

Cats, despite having natural abilities of agile moving and absorbing jumps from heights sometimes suffer injuries. They occur in a consequence of entangle of their leg, being hit by a car or attacked by other animal or human. Injured cat requires veterinary treatment.

At first, depending on kind of injury, it's recommended to give some medicine against shock and general painkillers which should calm the animal and prepare for further treatment. Next radiological examination should be performed in order to define injuries and help in decision of further steps and prevision concerning wound healing. The technique of anastomosis with the usage of nail or wire is well known and often used to help small animals [1-4].

This case study shows technique of joining cats hulled bone base of further radial bone and the ulna using Kirschner wires.

## Materials and Methods

European cat, age 10 months, delivered to the ARKA treatment center with the suspicion of sprain joint, around ulna, in the front leg. The RTG diagnose proved a few day hulled bone base of further radial bone and styloid process of the ulna. Such an injury is typical for young cats with immature skeleton and endless growing process. Such an injury is very often treated by proper adjusting of broken leg and application of stiffening bandage. Kirschner wires have been proposed as the most effective method of treatment for this case. Additionally proposed wires might not only sustain weight of the animal but also ensure stable position of the leg. Cat has been sedated and then put into inhaled narcosis. The leg has been prepared to the surgery by disinfection of area around broken part, removal of fur and skin layers. Afterwards bone has been properly placed and stiffed with two Kirschner wires framed in type X shape going through the base further and cranium radial bone. After one month RTG analysis have been performed, and Kirschner wires have been removed during reoperation. The wires have been observed using electron microscope equipped with X-ray energy dispersion spectrometer.

## Results and Discussion

Methods of inner anastomosis of cats bones is very comfortable as they allow quite normal behavior of the animal during the convalescence. There is just a little wound outside, with little stitches. Cat straight after narcosis is able to walk what also shortens time required for healing. Of course cat should have limited area to freely move, number of jumps should be minimized. FIG. 1 shows bone with Kirschner wires after implantation. It was proved that this kind of fixation was done properly. There was a complete healing process observed.



FIG. 1. RTG of bone with Kirschner wires after one month of implantation.

FIG. 2 shows microstructure of wires just after removing them from the leg. Examined surface is smooth, with no signs of corrosion. The EDS analysis confirmed chemical composition of examined wires. Some minor tissues have been also noticed on the investigated surface. In the tissue area nickel was not present what is important due to the irritant properties of nickel.

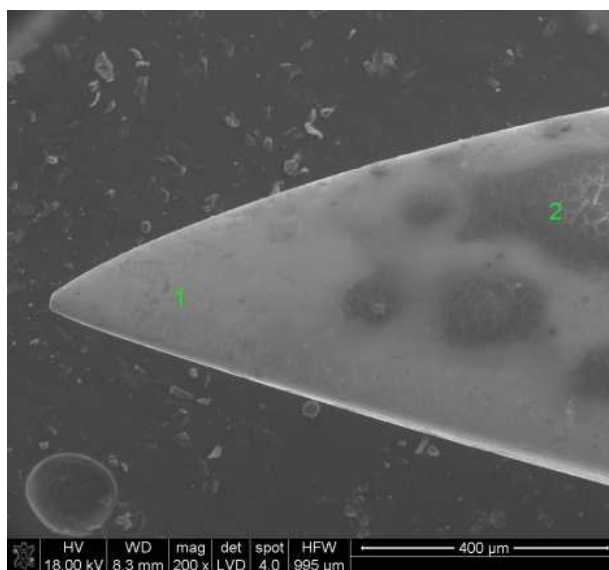


FIG. 2 SEM of Kirschner wire after one month of implantation.

## Conclusions

After 4 weeks from anastomosis the leg showed proper functionality. No inflammation has been noticed. Surgery treatment with the usage of Kirschner wires is one of the most effective techniques of healing broken ulna especially at young animals.

Combination of scanning electron microscopy and energy dispersive x-ray spectroscopy is a useful method for investigation corrosion on extracted metallic implants. Both techniques are effective in tracking changes in chemical composition during degradation or corrosion of implants.

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