

## Nonunion Fracture in 22 Dogs

Byungjae Kang, Yeeun Byeon, Hakhyun Ryu, Sungsu Park, Jaeyun Ko, Kyujin Sung, Yongsun Kim,  
Wanhee Kim and Ohkyeong Kweon\*

*Department of Veterinary Surgery, College of Veterinary Medicine, Seoul National University, Seoul, Korea*

**Purpose:** This study was performed to determine the causes of nonunion, the prognosis according to the type of nonunion after treatment of nonunion fracture and the prevalence of nonunion associated with age, body weight, affected bone.

**Materials and methods:** Medical records and radiographs of 22 dogs with nonunion fractures were presented to Veterinary Medical Teaching Hospital of Seoul National University from March 2004 to December 2008 were reviewed.

**Results:** The prevalence of nonunion was highest in dogs 1 to 3 years of age (54.5%) and in dogs weighting less than 5 kg (90%). The femur was most frequently affected (50%), followed by the radius and ulna (32%). Fracture instability was the most common cause of nonunion fractures (91%), followed by infection (9%). Treatment of nonunion fracture was performed in only 13 dogs of total 22 dogs. In treated 13 cases, 6 cases were noninfected viable nonunion fractures, 5 cases were noninfected nonviable nonunion fractures, and 2 cases were infected nonunion fractures. Treatment of nonunion fractures were provided as follows: adequate stabilization, bone graft, removal of fibrous tissue from fracture site, open of medullary canal, additional treatment in infected nonunion fractures, and alternative stem cell therapy. Nonunion fractures proceeded to bone union in 9 dogs of 13 dogs treated (69%), but bone healing didn't occur in 4 dogs of 13 treated (31%). Successful bone union occurred in all cases of noninfected viable nonunion fractures (6 cases) after adequate treatment. But, bone union occurred in only 1 case (20%) of noninfected nonviable nonunion fractures (5 cases) after treatment. Infected nonunion fractures (2 cases) were successfully resolved after adequate treatment.

**Conclusion:** For successful resolution of the nonunion fracture, the underlying cause must be determined. And adequate stabilization and additional treatment usually result in successful union. But, in difficult cases (for example, nonviable nonunion fractures), several biological and biophysical approaches may be required to minimize nonunions.

**Key words:** nonunion fracture, prevalence, cause, treatment, prognosis, dog

\*Corresponding author: ohkweon@snu.ac.kr