Growth plates closure time in small-sized puppies

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Introduction

Growth in length and body weight may differ dramatically among dog breeds, but closure of growth plates has only been reported in Beagles, large and giant breeds.
Thus, the aim of this study was to determine the age at radiographic growth plates closure in small-sized puppies and to associate this closure to puberty.
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Methodology

Animals
Twelve, pure and mixed-bred, small-sized, male and female healthy puppies were included in the study.

Follow up
The dogs were clinically and radiographically examined monthly from three to twelve months of age.
 According to radiological signs of growth plates closure, the appendicular skeleton physes were classified as open or closed (Fig. 1).

Statistical analysis
A binary logistic regression was conducted to predict the occurrence of each growth plate closure using age and puberty as the predictors.

Results

 Closure times of the analyzed physes are shown in Table 1.

Puberty influenced proximal humeral (Odds ratio=31.5; P<0.01) and distal radial (Odds ratio=62.6; P<0.01) growth plates closure.

No effect of puberty was detected on the remaining analyzed physes (P>0.1).

Conclusion

In small-sized dogs, growth plate closure was complete at 11 months of age.

The closure of proximal humeral physis and distal radial physis was influenced by the occurrence of puberty in these animals.

Acknowledgements

Figure 1 (a) Figure 1 (b) Figure 1 (c)

Figure 1. Mediolateral projection of the right forelimb of a 3 (a), 6 (b) and 11 (c)-months old female mixed-breed dog.

Table 1. Growth plates closure time in months (Mean ± SEM)

Bone	Months of age
Humerus	
Proximal physis	10 ± 0.1
Distal physis	6.1 ± 0.3
Radius	
Proximal physis	7.7 ± 0.2
Distal physis	8.2 ± 0.1
Ulna	
Proximal physis	7.5 ± 0.1
Distal physis	7.6 ± 0.1
Tibia	
Proximal physis	8.8 ± 0.1
Distal physis	7.6 ± 0.1
Tibial tuberosity	10.1 ± 0.4
Fibula	
Proximal physis	9 ± 0.0
Distal physis	7.7 ± 0.2
Femur	
Distal physis	7.8 ± 0.1