



#### KEY WORDS

- ✓ Intramedullary pin
- ✓ fracture healing
- ✓ radiology
- ✓ computed tomography
- ✓ biomechanics
- ✓ histopathology
- ✓ quail

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## Comparison of Clinical, Radiologic, Computed Tomographic, Biomechanical and Histopathologic Findings of Bone Healing Effects of Pins Made of Different Materials Used in Intramedullary Fixation of Tibiotarsus Fracture in Quail

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#### THESIS ABSTRACT

The aim was to compare the clinical, radiological, bone densitometric, biomechanical and histopathological findings of pins made of different materials in tibiatarus fractures. After creating a fracture in the right tibiatarus of twenty quails, bandage application was performed in GRI, intramedullary Kirchner pin in GRII, intramedullary bone pin in GRIII and intramedullary polymethylmethacrylate (PMMA) pin in GRIV. Clinical and radiological examinations were performed preoperatively and on postoperative days 0, 7, 15 and 30. After sacrifice on the 30th day, computerized tomographic (CT), biomechanical and histopathological examinations of the right and left tibiatarus were examined. Statistical analyses were performed on the data. Callus formation, visibility of the fracture line, problems in bone size and integrity were evaluated radiologically and CT. According to the statistical analyses, there was a significant difference only in bone size and integrity problems in the radiological evaluation, while a significant difference was observed in all parameters in CT imaging. The group that was biomechanically most resistant to bending force was GRII and the group that was least resistant was GRI. Fracture line healing was scored histomorphometrically. As a result of this evaluation made between 0-7, it was determined that the best healing was in GRIV with a value of  $5.60 \pm 0.54$ . GRIII ranked second with a value of  $5.20 \pm 0.83$ . GRII ranked third with a value of  $4.60 \pm 0.54$ . GRI was the group with the least histopathological healing rate with a value of  $2.60 \pm 0.54$ .

As a result, although GRIV (PMMA pin) was the group with the best healing in 30 days; it was seen that GRIII (bone pin) was the most ideal material as a result of its durability, lightness and histopathological fracture healing parameters.

#### APPLICATION AREAS OF THE THESIS RESULTS

The healing times and healed bone characteristics were compared and evaluated after intramedullary fixation operations using pins made of different materials in winged animal limb fractures. The findings are considered to provide clinically useful results and contribute to new studies that may be conducted in the future.

#### ACADEMIC ACTIVITIES

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