

## **Evaluation of osteogenic potentials of avian demineralized bone matrix in the healing of osseous defects in pigeons**

### **ABSTRACT**

Objectives: To evaluate avian allogeneic demineralized bone matrix (DBM) in the healing of long bone defects as a function of geometry and time in a pigeon model. Study design: Experimental. Animals: Adult rock pigeons (n = 60). Methods: Midshaft ulnar osseous defects were grafted with 2 geometric forms of DBM (tubular vs. chipped) and stabilized with a hybrid fixator. Autologous chips of sternal keel were used in a third group as control. Outcomes were evaluated by radiography and histology/histomorphometry at 4, 8, 12, and 24 weeks postoperatively. Results: Despite an early rapid healing response, autografts plateaued (histologic score and new bone area) by 8 weeks with no significant improvement afterwards. Conversely, allogeneic DBM implants demonstrated continuous temporal improvement in bone healing, and tubular DBM finally outpaced autograft implants after week 12 with values for metrics achieving statistical significance by week 24. Chip DBM was inferior to tubular DBM and autograft. Conclusions: Avian DBM is osteogenic, biocompatible, and safe in orthotopic sites with potential usefulness in avian bone grafting. Implant geometry (shape and size) affects such osteogenic potentials.

**Keyword:** Avian; Osteogenic; Pigeons; Anesthetic

