

## **Self-Reinforced Bioabsorbable Versus Metallic Fixation Systems for Metacarpal and Phalangeal Fractures: A Biomechanical Study.**

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Bioabsorbable fixation devices offer a useful option to treat small bone fractures of the hand if the prerequisite of reliable and stable osteofixation is met. We compared the stabilities of various bioabsorbable fixation devices with metallic fixation devices by using an oblique osteotomy model in radial to ulnar orientation. The 1.5-mm, self-reinforced, poly-L-lactide (SR-PLLA) pins provided fixation rigidity comparable with 1.5-mm K-wires in dorsal and palmar apex bending, whereas in lateral apex bending and in torsion the rigidity was equal to that of 1.25-mm K-wires. The 2.0-mm, self-reinforced, poly-L/DL-lactide (SR-P(L/DL)LA) 70/30 screws provided rigidity comparable with that of 1.5-mm K-wires in all testing modes. The bioabsorbable plate considerably enhanced the bending stabilities of the fixation system, but a single interfragmentary screw provided only limited rotational rigidity. The results show that by using ultra-high strength self-reinforced implants adequate fixation stability for hand fracture fixation can be achieved.