Are Active Plates Better Than Conventional Locking Plates?

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OTA, Orlando, FL, Oct 17, 2018
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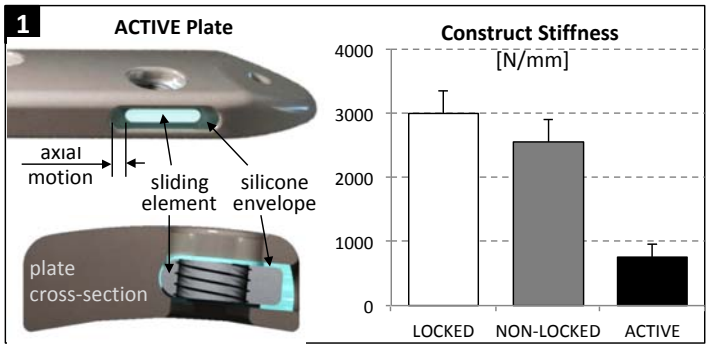
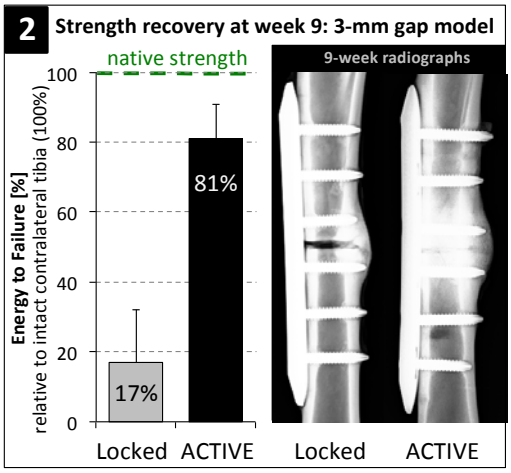
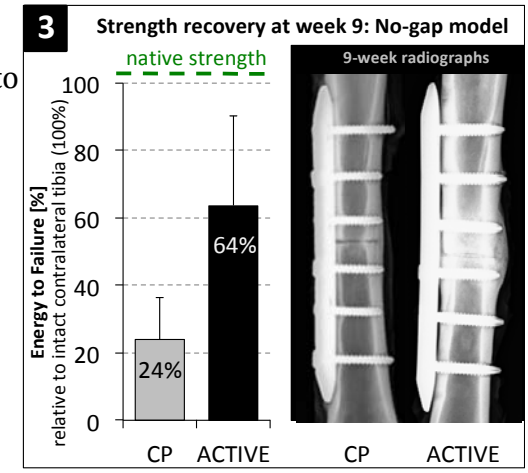


Rationale:
Natural fracture healing can be promoted by controlled dynamization, and can be inhibited by overly stiff plating constructs.[1] Active plates have elastically suspended screw holes that enable dynamic stabilization to promote natural fracture healing (Fig. 1).[2]



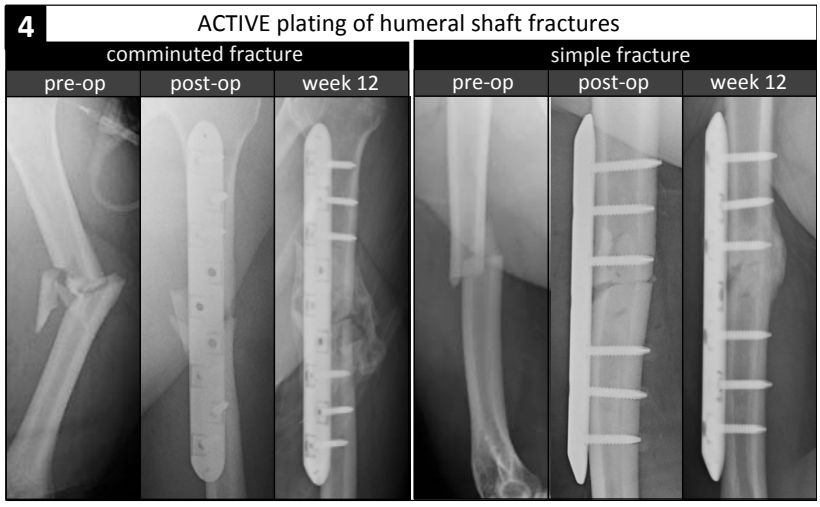
ACTIVE versus Locked Bridge Plating:
In the sheep tibia, bridge plating of a 3-mm fracture gap with ACTIVE plates resulted in faster and over 4 x stronger healing compared to locked bridge plating: 81% (ACTIVE) versus 17% (Locked) strength recovery at 9 weeks post-op (Fig. 2).[3]



ACTIVE versus Compression Plating:
In the sheep tibia, stabilizing a simple fracture with an active plate resulted in faster and over 2 x stronger healing compared to compression plating (CP): 64% (ACTIVE) versus 24% (CP) strength recovery at 9 weeks post-op (Fig. 3).[4]

ACTIVE plating of humeral shaft fractures:
In a clinical trial, humeral shaft fractures stabilized with ACTIVE plates healed on average after 11 weeks, as evident by bridging callus and pain-free function (Fig. 4).[5]

CONCLUSION: Dynamic stabilization with active plates can provide faster and stronger healing of both simple and comminuted fractures.



REFERENCES:
[1] Goodship AE, et al. Clin Orthop Relat Res. 1998 (355 Suppl):S105-115.
[2] Tsai S, et al. J Orthop Res. 2015; 33(8): 1218-1225.
[3] Bottlang M, et al. J Bone Joint Surg Am. 2016; 98(6):466-474.
[4] Bottlang M, et al. J Orthop Trauma. 2017; 31(2):71-77.
[5] Madey SM, et al. Iowa Orthop J. 2017; 37:1-10.