

## Medial Malleolar Sled

Sled fixation for horizontal medial malleolus fractures

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### Reference Information:

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Biomechanical Study, Level V - Mechanism-based reasoning

**Summary:**

Two constructs were tested for fixation of horizontal medial malleolus fractures; Medial Malleolar Sled was compared to two parallel 4.0mm unicortical partially threaded cancellous screws.

**Results:**

- There was a statistically significant difference in mean stiffness between Medial Malleolar Sled and two 4.0mm partially threaded cancellous screws ( $p < 0.001$ ). At 115% higher, the mean stiffness in offset tension loading was 232 (SD 83) N/mm for the Sled and 102 (SD 20) N/mm for screws.
- There was a statistically significant difference in mean force to clinical failure (2 mm displacement) with the Medial Malleolar Sled ( $p = 0.001$ ). At 52% higher, the mean force to clinical failure was 595 (SD 112) N for the Sled and 392 (SD 34) N for screws.
- The Medial Malleolar Sled construct demonstrated elastic recoil to pre-testing alignment after displaced to 6mm, while the screw construct remained displaced at 6mm.

### Selling Information:

- Medial Malleolar Sled fixation was significantly stiffer and required a greater force to induce clinical failure than two parallel unicortical partially threaded cancellous screws.
- Although the Medial Malleolar Sled requires slightly more exposure than two cannulated screws, the Sled "tension band" provides greater initial fixation strength.
- The Medial Malleolar Sled acts like a tension band in its ability to capture comminuted fragments, but unlike a tension band its profile is smooth.

**Useful in the Following Situations:**

- Superior fixation for transverse medial malleolar fracture.
- Reference when surgeons are skeptical about Sled's strength.
- When fixation based on screw thread purchase is unreliable due to poor bone quality.
- A bailout for failed two parallel screws which have 5-15 % reported nonunion rates.