

Title

**INTERFACIAL FRICTIONAL BEHAVIOR: CANCELLOUS BONE, CORTICAL BONE, AND
A NOVEL POROUS TANTALUM BIOMATERIAL**

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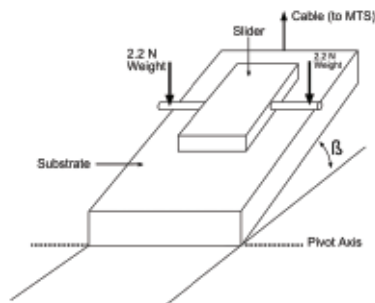
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Purpose/Premise

Laboratory testing was used to evaluate and compare the interfacial frictional characteristics of cortical bone, cancellous bone, and a porous tantalum biomaterial.

Material and Methods

The coefficients of friction were measured for 1) bovine cancellous bone against bovine cortical bone; 2) net-shape formed porous tantalum against bovine cortical and cancellous bone; 3) electron-discharge-machine (EDM)-shaped porous tantalum against bovine cortical and cancellous bone. The bovine cortical bone was tested with periosteum intact, periosteum denuded, and surface-flattened samples. Coefficients of friction were measured using an inclined plane apparatus. As the incline increased, the angle of slippage was measured.



Schematic of inclined plane testing fixture

Outcomes

Testing showed that the porous tantalum materials exhibited a higher coefficient of friction than natural bone autografts, allografts, or other porous-coated implant materials previously tested.

Conclusion/Recommendation

It was concluded that this higher friction should translate into greater initial stability of a porous tantalum implant, compared to natural bone grafts or other traditional porous materials.

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