A Novel Means of Measuring Time to Fracture Union by a Load Sensing Device Coupled with an Orthopedic Implant

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Technology description

Advances in our understanding of the cellular mechanisms underlying skeletal regeneration have not been effectively translated in vivo treatment because non-invasive monitoring of bone fracture healing is limited to imaging technology (i.e., for example, x-rays) that cannot be quantified and are subjectively interpreted. The method disclosed herein assesses rates of hip fracture healing using a strain gauge device implanted into a standard orthopedic implant. It has been demonstrated that such a device can measure differences between intact and partially osteotomized fracture models ($p<.05$) and that the device can distinguish between stable and unstable fracture patterns in completely osteotomized models across a physiologic range of loads. Such devices are compatible with in vivo bone fracture healing methods, wherein the device is placed onto an orthopedic implant and the strain data is transmitted on a real time basis, thereby providing a non-invasive quantification of bone fracture repair rates.

Institution

University of Massachusetts Medical School

Inventors

John Wixted

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com