Columbia Technology Ventures

Diagnostic system for pre-symptomatic detection of osteoarthritis

_Osteoarthritis (OA), a disease hallmarked by the degeneration of cartilage in the joints, affects 80% of the elderly population. By the time OA is symptomatic, the disease is too far progressed for reversal by current medical treatments. These therapies seek only to manage symptoms, and in some cases, full replacement of the joint may be the only treatment option. Early detection of OA may allow for interventions that can stall or reverse the disease; however, there are currently no methods available for detecting pre-symptomatic signs of OA._

This technology is a diagnostic system that uses computed tomography (CT) to monitor and assess the pathology of OA before symptoms arise. This system allows for early detection of OA and may enable early enough intervention to prevent further disease progression.

_Computed tomography system detects trabecular bone resorption before damage to cartilage occurs_

Current research suggests that the initial pathology responsible for the development of OA is abnormal resorption of the trabecular bone located directly beneath the cartilage of affected joints. The diagnostic system described in this technology is highly sensitive, and is able to detect subtle changes to the underlying trabecular bone of joints. The software uses high-resolution computed tomography (CT) images of the knee, wrist, or ankle, where more than half of OA cases occur. Because bone resorption can be detected before damage to the cartilage occurs, this technology may allow for timely introduction of interventions that forestall bone resorption and prevent OA symptoms from arising. It can also be used as a diagnostic tool to detect the progress of advanced OA and to evaluate the efficacy of therapeutic interventions.

This technology has been used to detect abnormal bone loss in knee samples removed during total knee arthroplasty surgery, before changes to overall bone density, mechanical structure, or the cartilage were observed.

_Lead Inventor:_

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Applications:

- Pre-symptomatic detection of osteoarthritis (OA)
- Tool for monitoring the progress of OA
- Tool for evaluating both pre- and post-symptomatic interventions against OA
- Diagnosis of OA
- Research tool for studying OA pathology

Advantages:

- Highly sensitive, high-resolution
- Can detect trabecular bone resorption before other OA symptoms arise
- Allows for pre-symptomatic detection of OA in at-risk patients

Patent Information:

Patent Pending (US 20160331339)
Tech Ventures Reference: IR CU15267

Related Publications:


Inventors

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