

Internship for master/bachelor students Biomedical Sciences (short Internship) or Medicine:

How can we predict neurological problems in patients with spinal metastases?

Background:

Spinal bone metastases are a common and severe complication in patients with advanced cancer. Spinal metastases may weaken the bone structure and can, therefore, lead to pathological fractures. These pathological fractures can interfere with the spinal canal and compress the spinal cord. Spinal cord compression can lead to severe neurological complaints, such as pain and paralysis.

Currently clinicians have great difficulties in predicting the fracture risk of metastatically affected vertebrae. Computer models are able to simulate the mechanical behavior of a metastatic vertebra and can help in the estimation of fracture risk. However, these computer models only simulate bone and can thus only simulate how vertebral fractures interfere with the spinal canal. They cannot simulate how, or to what extent, the spinal cord is compressed by the fractured vertebra. It appears that there is no classification defined which links the degree of spinal canal compromise to the neurological complications.



Aim:

Identify how 'spinal canal parameters' (e.g. diameter, area) are related to the occurrence and degree of neurological damage in patients with spinal metastases.

Methods:

We will examine pre-treatment CT and MRI scans of patients with and without impaired neurological function secondary to metastasized vertebrae. The following steps need to be taken:

- Generate literature overview on prediction models for neurological damage
- Cleaning existing database and preparing it for analyses
- Assess causes of neurological damage in collaboration with radiologist
- Measure spinal canal deformation on CTs and MRIs
- Relate characteristics of spinal canal deformation to the occurrence and degree neurological damage
- Write report/ scientific article

Duration: 18 weeks, start date: to be determined/variable.

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If you are interested or would like to receive more information, please contact Karlijn Groenen (Karlijn.Groenen@radboudumc.nl / 024-3613554).