Contribution ID: **225** Type: **Oral Presentation**

Mathematical modelling of the healing of venous leg ulcers

Monday, 9 July 2018 15:20 (20 minutes)

A leg wound which does not heal because of problems with the veins in the leg is called a venous leg ulcer (VLU). Chronic VLUs are the most common chronic wounds in western countries and their treatment is both costly and time consuming. In this work, we present a mathematical model of the healing of a VLU which incorporates the key biological features of this wound type. We have modelled the role of oxygen, fibroblasts and extra-cellular matrix (ECM) within the wound site. The model consists of a system of nonlinear partial differential equations describing their interactions in space and time coupled with a moving wound outer boundary. The blood vessels that surround the wound supply the oxygen that is needed to support the processes of fibroblasts and ECM to repair the wound tissue. We consider a wound in a simplified one-dimensional geometry and the model equations are discretised in space using the finite difference method and then solved in MATLAB. Numerical results are presented for the oxygen, fibroblasts and ECM distribution within the wound space using parameter values sourced from literature, where possible. This model can be used as a predictive tool in a clinical setting to compare treatments of VLUs including compression bandages.

Primary authors: SAHANI, Sontosh Kumar (The University of Melbourne); Dr FLEGG, Jennifer (The University of Melbourne); Dr OSBORNE, James (The University of Melbourne)

Presenter: SAHANI, Sontosh Kumar (The University of Melbourne)

Session Classification: Wounds & healing

Track Classification: Human Physiology