

PP 09 - A computational model using artificial neural networking for predicting astigmatism following corneal surgery

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Keratoconus is an eye condition where the cornea thins and starts to bulge. Corneal cross linking is the only available accepted treatment to prevent or decrease the progression of Keratoconus. Although this treatment is considered a successful intervention, numerically it has a 7.6% failure rate and 2.9% complication rate according to the post-operative statistics. Corneal stability and the astigmatism after the corneal crosslinking can only be measured using pre-operative and post-operative patients' records. When counselling and selecting patients for this procedure corneal surgeons lack a definitive prognosticating aid to discuss with the patients.

The aim of the research is to develop an artificial neural network model to predict the post-operative astigmatism for the patients undergoing corneal cross-linking surgery.

In this study a target dataset was based on the patients' records. The neural network was built using the post-operative and preoperative records of 30 patients. The knowledge discovery process in machine learning design was applied to the datasets to minimize the error rate for the neural network.

The researchers were able to discover higher success rate of best corrected vision with the correlation of patients with the age group 18 to 20 and male patients had a 66% success rate compared to the female patients. The accuracy of the dataset and new insights can be improved in the neural network by having a larger dataset. Surgical and bio mechanical factors of the cornea can be used to modify the neural network, as future work.

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