Under the Microscope

Stephen Honeybul, Consultant Neurosurgeon

New research being undertaken by Royal Perth Hospital (RPH) Consultant Neurosurgeon, Dr Stephen Honeybul could potentially improve outcomes for patients undergoing surgery for brain injuries.

'Randomised controlled trial of autologous versus titanium cranioplasty after craniectomy,' explores methods to improve the restoration of the protective and cosmetic functions of the cranium.

Dr Honeybul's research examines an alternative to traditional autologous cranioplasty methods through titanium cranioplasty operations.

"An autologous cranioplasty involves the removal of a portion of the patients' skull, which is then stored and reattached in a post-surgical operation. Meanwhile, titanium cranioplasty uses titanium plates to replace bone removed during neurosurgery," Dr Honeybul said.

Despite being a technically straightforward procedure, cranioplasty is commonly associated with a number of complications.

Such complications are predominantly associated with infection and the compromise of the protective function of the cranium.

While titanium plates are already being used in cranial surgery, current clinical practices only use titanium plates in cranioplasty following complications.

"Research into the effectiveness of titanium versus autologous cranioplasties has the potential to influence clinical practice, driving regular use of custom-made titanium plates," Dr Honeybul said.

"Complications develop in almost one third of brain injury operations, with infection and resorption causing significant problems for patients post-surgery.

"Exploring the use of titanium plates in cranioplasty operations allows us to examine the efficiencies and benefits to patients of the procedure."

The study will be conducted at random with eligible patients receiving either an autologous or titanium cranioplasty procedure, ensuring research outcomes are measurable and objective data evaluation can occur.

Primary outcomes will focus on the rate of infection and bone flap reabsorption 12 months after the initial operation using computed tomography (CT) scans. Meanwhile, secondary outcomes will focus on complication rates after surgery, quality of life and hospital costs incurred by the patients.

"In the long-term, this research could have a significant impact on clinical practice," Dr Honeybul said.

"It will identify the most efficacious method to successfully restore the protective and cosmetic function of the cranial vault, improving patient outcomes and surgical efficiency."