Every year, an estimated 7 million people in the United States need vascularized composite tissue reconstruction secondary to surgical excision of tumors, accidents, and congenital malformations.\(^1\) Limb amputees alone comprise 1.6 million of these individuals.\(^2\) The concept of vascularized composite allotransplantation (VCA) is not new, with practices dating as far back as the 4\(^{th}\) century. Consequently, advances in conventional treatments in reconstructive surgery over the years have greatly improved the surgeon’s ability to cover large tissue defects and even restore form and function.\(^3\)

The evolution of reconstructive surgery has become ever more valuable in the face of the current conflicts of Iraq and Afghanistan, where servicemen and women that would have otherwise lost their lives now present with more complex wounding patterns of the extremities. While lower extremity prostheses have allowed many individuals to regain their independence and mobility, upper extremity prostheses have not. The notion that upper extremity prostheses cannot provide the same functionality and quality of life as a ‘real hand’ has been the catalyst for the surge of vascularized composite allotransplantation in the form of hand transplantation.

The microsurgical techniques required to successfully transplant hands and other vascularized composite tissues have been well established and used by plastic and reconstructive surgeons for decades. The immunosuppression therapies currently used as standard of care in solid organ transplantations are the same as those used in hand transplantations that have been done.\(^3\) Unlike solid organ transplantations however, transplantation of a hand does NOT prolong a patient’s life. As such, the tragedies of the current war have provided an impetus for investigating immunological barriers associated with tissue allotransplantation of the hand, because while there are tremendous benefits in the improvement of a patient’s quality of life, there are also the potentially life-threatening risks attributed to the use of long term immunosuppression.

The inherent ethical dilemma associated with hand transplantation lies in the fact that a non-life threatening condition is treated with a procedure and subsequent therapies which potentially have life threatening sequelae, simply to improve a patient’s quality of life. Hand vascularized composite tissue allotransplantation is now a clinical reality, however, to what extent will this reconstructive procedure become the standard of care given the associated risks? The purpose of this talk will be to examine the past, present, and future implications of hand transplantation.