Patient-specific interface pressure case study at transradial prosthetic socket: comparison trials between ICRC polypropylene socket and air splint socket.

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Abstract

BACKGROUND: While considering how important the interface between the amputee with the prosthesis socket, we have carried out research to compare the gradient pressure occur at the interface socket that may lead to the discomforting effects to the user using common ICRC polypropylene socket and air splint socket.

DESIGN: Not Applicable SETTING: Not Applicable POPULATION: The subject was a 23 year old who suffered a traumatic defect on the right arm caused by higher electrical volt.

METHODS: F-Socket sensors have been used to measure dynamic socket interface pressure for the transradial amputation experienced during static and dynamic movements. The printed circuit with a thickness of 6.18 mm is equipped between the socket and the surface of the residual limb. Two F-Socket sensors are required to cover the entire socket surface attached to the residual limb. The average of 10 trials made on prosthetic user using both type of sockets for static and dynamic movements was recorded.

RESULTS: The pressure gradient shows that the circumference of the socket interface becomes more stable over the ICRC polypropylene socket gives the most pressure distributions to the amputees compared to the pressure gradient for the air splint socket.

CONCLUSION: The pressure gradient for ICRC socket increased consistently when the user makes movements while for the air splint socket remain constantly.

CLINICAL REHABILITATION IMPACT: The specific interface pressure occur at the socket interface help in determine the comfort and pain of the socket design and improve the correlation between the user and the prosthesis.