

Feasibility Testing Report – Upper Muscle Attachment, Stage 2

Team: P15001: Active Ankle Foot Orthotic

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Related System: ABBBB: Raise Foot; AAA: Secure Foot

Stage 2 of this test was completed to determine the functionality of the additional strap at the top of the brace positioned on the leg. It was determined during stage 1 of this test that the Velcro straps that existed on the brace were not sufficient enough to counteract the force that the muscle will pull down on the brace with, and that an additional Velcro, non-elastic strap would be needed to counteract this force. This test was done to determine if the force from the new strap would be sufficient enough to secure the brace to the leg.

Testing Procedure

The testing procedure was identical to the one completed during stage 1, except the attachment was only done about 2 inches from the top of the brace. This was proved to be the needed position during stage 1 of testing.

The brace was attached to the leg and both the original Velcro straps, along with the new non-elastic Velcro strap that was added and sewn to the brace, were secured. The force was then pulled down on the brace to determine the results of the test and the function of the new strap.



Results

Because our safety pin once again snapped, full results for the max force needed were not found. However, when pulled with around 7 pounds of force, which is about our maximum value, there was

very initial slippage on each pull after the initial slippage that we anticipate. The first pull of the muscle will provide a little slippage as the brace settles onto the leg; however, subsequent pulls did not significantly move the position of the brace on the leg.

Conclusions

What we learned from this test:

- The attachment position will indeed need to be below the top of the brace
- The new non elastic Velcro strap should be sufficient enough to counteract the force from the muscle
- We learned that there will be an initial slippage, but the strap prevents any major slippage after the initial slip

Next Steps

The next steps for this test will be to iterate it once again once the final muscle attachment piece is designed. A preliminary piece has been designed and a prototype is being machined; once this piece is made, we will be able to sew this to the brace and actual attach and actuate the muscle we plan to use to raise the foot. This will even better reflect our final prototype design and will further validate that the strap we chose at the top of the brace will be sufficient enough to prevent major slippage.