

Gender Difference in Cast Pressure and the Relationship with Complex Regional Pain Syndrome

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Introduction and Objectives:

Complex regional pain syndrome (CRPS) is a devastating complication of distal radius fractures. CRPS has been found to be linked to high cast pressures and is found to be three times more common in women than in men. This study sought to demonstrate the difference in cast pressures between genders and to suggest that this difference in cast pressure may be an attributing factor to the higher incidence of CRPS in women.

Materials and Methods:

This study recruited healthy volunteers to demonstrate the difference in cast pressures between males and females. Volunteers with any hand pathology were excluded from the study. Each volunteer had both right and left hands casted in short arm casts. The casts were applied by the same investigator to eliminate differences in cast application technique. Cast pressure measurements were taken using an Ad Instruments Pressure Transducer by incorporating a 50cc empty normal saline bag (pictured to the right) into the cast at the level of the metacarpals with the hand positioned in mid-flexion (neutral) with increasing amount of air inserted into the empty saline bag to mimic increasing swelling. Data was then analyzed using SPSS software.



Results:

25 volunteers were recruited for a total of 50 hands casted. 13 were male and 12 were female. The age range of the volunteers was from 18-72 years. Figure 1 demonstrates the average results of cast pressures for each gender with increasing amounts of "swelling". The results become statistically significant at 20 ml of air in the cast and the difference becomes increasingly accentuated as "swelling" continued to increase.

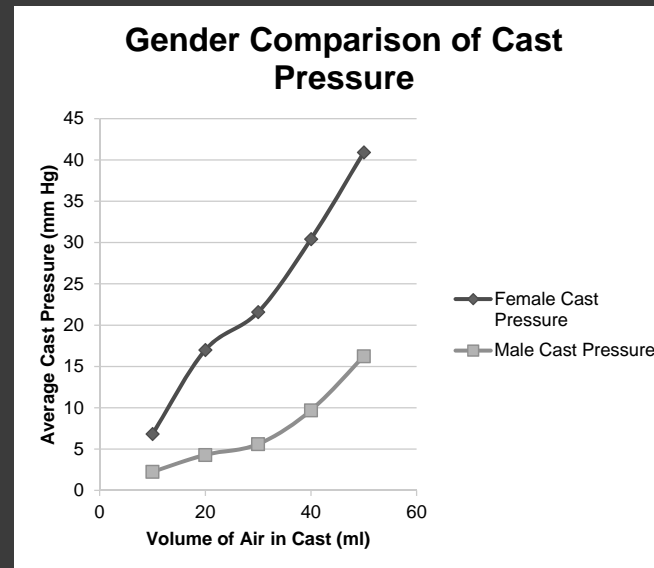


Figure 1. Cast pressure difference when comparing the two genders with increasing amounts of air- simulating increased "swelling".

Discussion:

The results of this study demonstrated that females have statistically significant higher cast pressures than males after a small amount of "swelling" has been introduced into the cast and that this difference continues to increase as "swelling" is increased. The reason for this difference in cast pressure at this time is unclear but is possibly a result of the difference in the amount of soft tissue present on the hands between genders and further studies are indicated. The results of this study demonstrates a potentially very important factor in determining why females have a higher rate of CRPS than males as high cast pressures have been linked to the CRPS. This suggests that females with distal radius fractures who are placed in casts should be monitored more closely than males for "tight" casts to potentially prevent the development of CRPS.