

## Role of Anthropometric Data in the Prediction of 4-Stranded Hamstring Graft Size in Anterior Cruciate Ligament Reconstruction

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### Summary:

Pre-operative Anthropometric data has a positive correlation with 4-stranded hamstring graft size and can be utilized for pre-operative planning in anterior cruciate ligament reconstruction

### Abstract:

The objective of this study was to evaluate whether pre-operative anthropometric data can predict the diameter and length of hamstring tendon autograft for anterior cruciate ligament (ACL) reconstruction.

This was a cohort study that involved 169 patients who underwent single-bundle ACL reconstruction (single surgeon) with 4-stranded Gracilis and Semi-Tendinosus autografts. Height, weight, body mass index (BMI), gender, race, age and smoking status was recorded pre-operatively. Intra-operatively, the diameter and functional length of the 4-stranded autograft was recorded. Multiple regression analysis was used to determine the relationship between the anthropometric measurements and the length and diameter of the autografts.

The strongest correlation between 4-stranded hamstring autograft diameter was height and weight. This correlation was stronger in females than males. BMI had a moderate correlation with the diameter of the graft. Females had a significantly smaller graft both in diameter and length when compared with males. Simple regression analysis demonstrated that height and weight can be used to predict hamstring graft diameter.

The following regression equation was obtained for females:

Graft diameter =  $0.012 + 0.034 * \text{Height} + 0.026 * \text{Weight}$  (  $R^2=0.358$ ,  $p=0.004$ )

The following regression equation was obtained for males:

Graft diameter =  $5.130 + 0.012 * \text{Height} + 0.007 * \text{Weight}$  (  $R^2=0.086$ ,  $p=0.002$ )

In conclusion, pre-operative anthropometric data has a positive correlation with the diameter of 4 stranded hamstring autografts. This data can be utilised to predict the autograft diameter and may be useful for pre-operative planning and patient counselling for graft selection.