

ORIGINAL RESEARCH

BUILDING A BETTER GLUTEAL BRIDGE:
ELECTROMYOGRAPHIC ANALYSIS OF HIP MUSCLE
ACTIVITY DURING MODIFIED SINGLE-LEG BRIDGES

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ABSTRACT

Background: Gluteal strength plays a role in injury prevention, normal gait patterns, eliminating pain, and enhancing athletic performance. Research shows high gluteal muscle activity during a single-leg bridge compared to other gluteal strengthening exercises; however, prior studies have primarily measured muscle activity with the active lower extremity starting in 90° of knee flexion with an extended contralateral knee. This standard position has caused reports of hamstring cramping, which may impede optimal gluteal strengthening.

Hypothesis/Purpose: The purpose of this study was to determine which modified position for the single-leg bridge is best for preferentially activating the gluteus maximus and medius.

Study Design: Cross-Sectional

Methods: Twenty-eight healthy males and females aged 18-30 years were tested in five different, randomized single-leg bridge positions. Electromyography (EMG) electrodes were placed on subjects' gluteus maximus, gluteus medius, rectus femoris, and biceps femoris of their bridge leg (i.e., dominant or kicking leg), as well as the rectus femoris of their contralateral leg. Subjects performed a maximal voluntary isometric contraction (MVIC) for each tested muscle prior to performing five different bridge positions in randomized order. All bridge EMG data were normalized to the corresponding muscle MVIC data.

Results: A modified bridge position with the knee of the bridge leg flexed to 135° versus the traditional 90° of knee flexion demonstrated preferential activation of the gluteus maximus and gluteus medius compared to the traditional single-leg bridge. Hamstring activation significantly decreased ($p < 0.05$) when the dominant knee was flexed to 135° (23.49% MVIC) versus the traditional 90° (75.34% MVIC), while gluteal activation remained similarly high (51.01% and 57.81% MVIC in the traditional position, versus 47.35% and 57.23% MVIC in the modified position for the gluteus maximus and medius, respectively).

Conclusion: Modifying the traditional single-leg bridge by flexing the active knee to 135° instead of 90° minimizes hamstring activity while maintaining high levels of gluteal activation, effectively building a bridge better suited for preferential gluteal activation.

Level of Evidence: 3

Key words: Gluteus maximus, gluteus medius, muscle recruitment, rehabilitation exercise

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