Uncontrolled intervention studies demonstrate improvements in vasomotor symptoms (VMS) following stellate ganglion blockade (SGB) with local anesthetic. This study presents the first randomized, sham-controlled trial of SGB for the treatment of VMS. Participants included 40 postmenopausal women 30-70 years-old with moderate-to-severe VMS. The design was a randomized, sham-controlled trial comparing the effect of SGB versus sham injection on the frequency of total and moderate-to-severe VMS as measured by daily diaries. VMS were recorded at baseline and for six months thereafter. Objective VMS were recorded using ambulatory sternal skin conductance monitoring over a 24-hour period at baseline and 3-month follow-up. There were no significant group differences in overall VMS frequency, but the frequency of moderate-to-very severe VMS was reduced more in the active compared to sham treatment group. The frequency of objective VMS was also reduced to a greater degree in the SGB group compared to the sham group. There were no study-related serious adverse events. SGB may provide an effective treatment for VMS in women who seek non-hormonal therapies due to safety concerns and personal preference. A larger trial is warranted to confirm these findings.