Objective: To examine the effects of classical technique, electrocautery, and ultrasonic dissection on endothelial integrity, function, and preparation time for harvesting the radial artery (RA) during coronary artery bypass grafting (CABG).

Methods: Forty-five patients who underwent isolated CABG and whose RA was suitable for use were studied and divided into three groups: Group 1, classical method (using sharp dissection); Group 2, electrocautery; and Group 3, ultrasonic cautery. Levels of prostacyclin and nitric oxide derivatives were examined biochemically; vascular cell adhesion molecule 1 (VCAM-1) and endothelial nitric oxide synthetase (eNOS) values were assessed using immunohistochemical staining. RA preparation time, RA length/harvesting time ratio, and drainage amounts at the site of RA removal were compared.

Results: Differences in RA preparation time (Group 1: 25±6 min, Group 2: 18±3 min, Group 3: 16±3 min, P<0.001) and length/harvesting time ratio (Group 1: 0.76±0.19 cm/min, Group 2: 0.98±0.16 cm/min, Group 3: 1.13±0.09 cm/min, P<0.001) were statistically significant among the groups. Levels of prostacyclin and nitric oxide derivatives were not statistically significant different, VCAM-1 and eNOS expressions were observed to be similar among the groups, and endothelial damage was detected in only one patient per group.

Conclusion: Use of ultrasonic cautery during RA preparation considerably reduces the preparation time and postoperative drainage amount. However, the superiority of one method over the others could not be demonstrated when the presence of endothelial damage with both biochemical and histopathological evaluations was considered.