

Computed Tomographic Scanning versus Duplex Ultrasonography for Surveillance after Endovascular Aneurysm Repair: Computed Tomography is Essential and Better

NOTES

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Color duplex ultrasonography (CDUS) and computed tomography (CT) have both been used to evaluate patients following endovascular abdominal aortic aneurysm (AAA) repair. Few studies have compared the two modalities for follow-up of endovascular grafts. Some studies have suggested that CDUS may be as effective as CT for the detection of endoleaks and diameter changes, whereas others maintain that CT is superior to CDUS as a modality for follow-up of patients undergoing endovascular AAA repair.

Patient Population and Methods

All patients with AAAs who underwent endovascular repair using three commercially available devices (Ancure, AneuRx, and Excluder) were analyzed. Our follow-up protocol included serial CT and CDUS at 1 month and every 6 months thereafter. Both modalities were done within the same week. The correlation of CT and CDUS in determining AAA size measurement after endovascular repair was also analyzed. CT was used as the gold standard in determining the sensitivity, specificity, positive predictive value, and negative predictive value of CDUS in detecting endoleaks. The data were analyzed using kappa statistic.

Results

One hundred seventy-eight patients were included in this study (86 Ancure, 55 AneuRx, and 37 Excluder). The mean age was 74 years. Follow-up ranged from 1 to 53 months (mean 16 months). Three hundred sixty-seven paired studies (CT and CDUS) were analyzed. Thirty-four (19%) endoleaks were noted (26 early and 8 late endoleaks). The sensitivity, specificity, positive predictive value, and negative predictive value of CDUS in detecting endoleaks were 67%, 99%, 86%, and 97% (kappa = 0.72). CDUS was more accurate in detecting type I endoleak than type II (88% vs 50%, $p < .05$; Table 1). The mean diameter of the AAA sac after repair was 5.15 by CT versus 4.99 by CDUS ($p = .07$). Ninety-three percent of paired studies were somewhat similar (? 5 mm). Postoperative AAA size changes throughout follow-up were -0.60 mm for CT versus -0.582 mm for CDUS ($p = .78$).

Conclusions

Although CDUS has a good correlation to CT in measuring the size of AAAs, it has a lower sensitivity in detecting endoleaks, particularly type II endoleaks. Therefore, CT scans should remain the primary imaging for the diagnosis of endoleaks.

Table 1.

CT Scans and CDUS and Type of Endoleak
CT Scan Positive (n) US Negative US Positive
p Value n % of Positive CT Scans n
% of Positive CT Scans

Type I 16 2 12.5 14 87.50 .046

Type II 16 8 50 8 50

Type III 2 1 50 1 50

Total 34 11 33 23 67

CDUS = color duplex ultrasonography;

CT = computed tomography; US = ultrasonography.

References

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