

An evaluation of centerline of flow measurement technique to assess migration in Thoracic stent grafting.

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Objective: To develop and validate a means to accurately detect migration of thoracic endoprostheses.

Materials and Methods: Patients treated for thoracic aneurysms (without dissections) with either the Cook Zenith TX1 /TX2 or Gore TAG device were retrospectively reviewed. All patients with DICOM imaging data at a minimum of 6 months follow-up were included in this analysis. Centerline of flow (CLF) calculations were used to determine length measurements to establish distances from anatomical landmarks (left common carotid and celiac arteries) to the proximal and distal aspects of the prostheses. Images perpendicular to the centerline of flow were used to establish diameter measurements. 3D reconstructions were visually created for each follow-up time-point.

Results: Of 186 patients evaluated (126 Zenith, 60 TAG), 44 were treated for dissections and were excluded, 54 patients did not have baseline and at least 6 month DICOM follow-up data, leaving 84 patients for analysis. Maximum follow-up was available on 19 patients at 6 months, 37 patients at 12 months, 14 at 24 months, 9 at 36 months and 5 patients at 48 months. CLF analysis noted >10 mm caudal movement of the proximal device in 9 patients, and cranial movement of the distal device in 3 patients. When this subset was further scrutinized in the context of detectable morphologic changes independent from the endograft fixation systems, 4 patients were noted with clear movement of the proximal or distal fixation system with respect to the initially deployed location.

Conclusion: Distance calculations based on CLF measurements may overestimate the frequency of true migration. However, the analysis can be easily reproduced, creating a subset of patients that mandate a detailed evaluation of the device position in context with relevant aortic morphology (graft angulation,

aortic length measurements). Analogous to experiences with infrarenal endoprotheses, the importance of early detection of migration cannot be overstated given the potential to avert disastrous consequences.