1 Year CTA Imaging Follow Up in Nellix EVAS: Observations and Implications

T.G. ter Mors[1], L.H. van den Ham[1] J.T. Boersen[2], J.P.P.M. de Vries[2], J.M.M. Heyligers[3], P.W. Vriens[3], M.M.P.J. Reijnen[1]
[1.] Rijnstate Hospital Arnhem [2.] St. Antonius Hospital Nieuwegein [3.] St Elisabeth Hospital Tilburg

Introduction

In an effort to broaden EVAR applicability and reduce the reintervention rate the Nellix EndoVascular Aneurysm Sealing (EVAS) system was developed. The system consists of two endoframes surrounded by endobags which are filled in situ with a liquid polymer. The polymer solidifies at body temperature thus conforming to the aneurysm sac. As the concept is different compared to EVAR, imaging during surveillance may be more difficult to interpret.

This study aims to assess and quantify CT appearance during the first year after EVAS.

Purpose

To Investigate physiological anatomical changes in aorta-iliac anatomy as seen on computed tomography angiography (CTA) after 1 year follow up.

In collaboration with:

UNIVERSITEIT TWENTE.

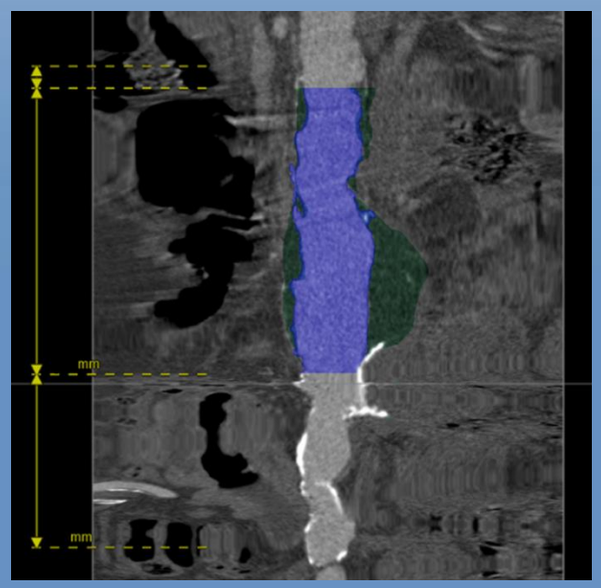
St. Elisabeth Ziekenhuis

ZIEKENHUIS ST ANTONIUS

Methods

Three Dutch hospitals (Rijnstate Arnhem, St. Elisabeth Tilburg and St. Antonius Nieuwegein) participated in this study. Complete Imaging data pre-, post-operative and 1 year follow up of 50 patients treated with Nellix EVAS of the three participating centers was collected. Patients were treated both in and outside of the instructions for use. Patients were excluded in case of accessory stent placement (chimney's, snorkel or extensions), incomplete follow up or uni-iliacal placement.

Using 3Mensio (Pie Medical Imaging, Bilthoven, The Netherlands) software predefined aneurysm and stent geometrics were measured. Both automatic and semi-automatic generated central luminal lines were used for aneurysm measurements. Comparative analysis was performed to assess for changes over time.



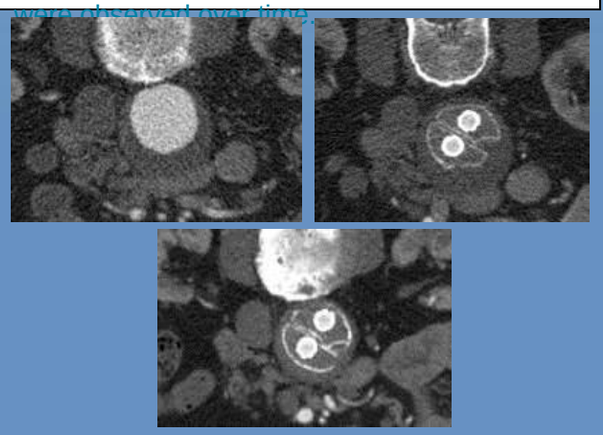
Sections of interest

Results

The aortic neck showed no significant changes over time in diameter, angulation and volume measurement. There were no signs of thrombus development proximal of the stent. The stent and it's polymer filled endobags had no significant influence on both proximal and distal neck angulation.

The AAA volume increased significantly from the preoperative to postoperative scan (difference = 11.028 mL, p <0.001), but reached the preoperative values on the 1 year scans (difference= -2.188 mL, p =1.00). Polymer volume increased slightly but significantly over time after introduction (difference = 2,9mL, p<0.001).Thrombus volume (difference= -10.86 mL, p= 0.242) showed a decreasing non-significant trend after EVAS. Diameters, areas and angulation of the aortic sac remained stable both postoperative and after 1 year.

The maximum angulation of the both common iliac artery decreased after EVAS (difference= -8.77, SE= 2.02, p <0.001), reconfigured toward the original position from post EVAS to 1 year after EVAS (difference= 5.88°, p= 0.002).No volume, diameter or area changes were observed over time.



Axial view of changes (pre-, post- and 1 year).

Conclusion

Nellix EVAS shows no major anatomical changes on CTA imaging in 1 year follow up. The apparent bilateral iliac angulation decrease on postoperative scans increases after 1 year which means a restore of iliac angulation. AAA and thrombus volume show a decreasing trend over time indicating successful aneurysm exclusion and thrombus reorganisation. A surprising find is the slight increase in polymer volume after 1 year.

3D view of segmentation