No More Contrast Medium! -The Efficacy of IVUS-Guided EVAR

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Objective:

The use of contrast medium and radiation exposure in EVAR is one of the unavoidable disadvantages. We elucidated the use of contrast medium and radiation dose reduction using IVUS (Intravascular Ultrasound) and diluted contrast medium.

Methods:

We retrospectively studied 90 patients who underwent EVAR for infrarenal abdominal aortic aneurysm from January 2023 to August 2024. The use of contrast medium and radiation exposure was investigated in two groups: those with IVUS (IVUS group) and those without IVUS (conventional group). The fluoroscope was the SHIMADZU Trinias C16 and the IVUS was the Visions PV .035. In the IVUS technique, the renal artery and internal iliac artery were identified and marked by IVUS, and the vessel diameter, characteristics and device leg length were measured. The device was implanted based on the markings and measurements, and final contrast was performed. In the IVUS group, intraoperative DSA imaging was performed using diluted contrast (4x dilution).

Results:

Of the 90 total patients, 45 were in the IVUS group and 45 in the conventional group. The mean use of contrast medium was 19.9±15.2 mL vs 66.6±34.0 mL ($p<0.0001$) and the mean radiation dose was 525±291 mGry vs 827±496 mGry ($p=0.0007$), which were significantly reduced using IVUS. In two patients in the IVUS group, the use of plain CT scan, intraoperative IVUS and postoperative abdominal ultrasonography enabled EVAR to be achieved without any perioperative use of contrast medium.

Conclusion:

The use of IVUS in EVAR significantly reduced the intraoperative use of contrast medium and radiation exposure. We have also demonstrated that EVAR without any perioperative use of contrast medium is possible by using plain CT, IVUS and abdominal ultrasonography. We strongly believe that the use of contrast-free EVAR should be promoted in the future, taking patient safety and risk into consideration.