

# Type 2 Endoleak: Is the preventive Sac Embolization the Definite Option?

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## ABSTRACT

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## Opinion

Endovascular aortic repair (EVAR) is a procedure used to treat an abdominal aortic aneurysm (AAA). The most prevalent indications for reintervention in EVAR are endoleaks. Endoleaks (especially type I and type III) are contributors of the higher rate of late rupture compared with open repair. Persistent type 2 endoleaks could lead to the insurgence of a type I endoleak which is a type of endoleak associated with increased risk of rupture. Overall, the risk of rupture associated with T2 EL is less than 1% but unfortunately 50% of those ruptures are in no sac growth cases. Type 2 endoleaks (T2ELs) occur after EVAR in nearly 25% of patients and they are caused by a continued retrograde blood flow from abdominal aortic side branches (lumbar arteries and inferior mesenteric artery). T2ELs are subdivided into two groups according to the onset: early EL, if it is diagnosed within 90 days from the procedure, and late EL if the diagnosis occurs after 90 days from the procedure. Furthermore T2ELs are subdivided into two groups according to anatomy: type 2a if there is a single causative vessel involved with a "to-and-fro" flow in the aneurysmal sac; type 2b if multiple vessels are involved. Approximately 80-90% of T2ELs resolve spontaneously, but they become a real dangerous complication of EVAR, with the indication to treat, when they persist more than 6 months or when the aneurysmal sac growths in 6 months more than 5 mm or more than 10 mm in one year, compared with preoperative AAA diameter.

The follow up of these type of ELs are contrast-enhanced

ultrasonography (CEUS) or computed tomography (CT) with contrast. CEUS is a particular type of ultrasound exam which allows the study of the circulation in real time with the use of a type of contrast eliminated from lungs. This is a technique that has a similar efficacy in diagnosis to the CT without the use of radiation and nephrotoxic contrast. Furthermore the use of CEUS is less expensive respect the CT. The preventive embolization of aneurysmal sac can be done with spirals, glue or plug. Recently study suggested a routine intra-procedural sac embolization in case of six efferent patent vessels and/or thrombus volume  $\leq$  of the total AAA volume and/or the presence of an inferior mesenteric artery (IMA)  $> 3$  mm of diameter plus  $>3$  patent lumbar. In literature there are nearly 2,000 papers about the management of EVAR-associated endoleaks, despite this some clear messages unfold about the prevention of the type 2, which may consist in routine sac embolization during the EVAR procedure. If the patient doesn't undergo the preventive embolization and develop a T2EL, which need a treatment, we have to add to the cost of embolization, the new hospitalization's cost and the cost of the follow up for aneurysm sac diameter with CEUS or CT scan. It is impossible to foresee who will certainly develop or not an endoleak especially the type 2 endoleak, for this reason, in my opinion, it is possible that in term of cost-effectiveness and in term of avoiding multiple recovery and aneurysm post-EVAR rupture, a routine intra-procedural embolization of aneurysmal sac could be the gold standard indication but long-term outcomes are necessary to confirm this strategy.

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