BACKGROUND

Arterial aneurysms (An) are traditionally treated surgically, but more and more by interventional procedures with a high technical success rate, but some problems are not solved like protection of aneurysm rupture, endoleaks, stent thrombosis, collateral branch thrombosis. We used a new concept of stent, the Multilayer Flow Modulator (MFM*) to treat An. and try to avoid some drawbacks encountered with endografts.

METHODS

This MFM* is a 3 Dimensional braided tube made of several interconnected layers without any covering. Our earliest in vitro (theoretical simulation), computerized Fluid dynamics, Molecular Modelization and in vivo tests demonstrated that this MFM* reduces the velocity in the aneurismal sac up to 90% by modifying the hemodynamic conditions. A saccular aneurysm without collateral branch will thrombose quickly. If a collateral branch is present the flow is directed towards this branch leading to shrinkage of the aneurysm. Animal experiments show excellent results. Moreover, as demonstrated in animal and human studies this MFM* preserves the collateral branches allowing the possibility to cover any artery without compromising the flow (renal, digestive arteries, supra aortic vessels...).

RESULTS

44 peripheral An. (iliac:23, femoral:1, popliteal:5, renal:8, mesenteric:2, carotid: 2, Subclavian : 2, Caeliac trunk :1) were treated with the MFM* (male:31, mean age 62±8 y) (57 stents ± 14 mm length 40 to 120 mm) were implanted to treat these aneurysms, by femoral approach (43 cases), brachial approach (1 case). Technical success in all patients. No complications. All An. thomboosed with diameter reduction in some pts. The thrombosis could take several weeks depending on the importance of collateral branches. 6 month to 36 month follow up will be presented and we will discuss the time needed to achieve exclusion of the An. All the side branches remained patent.

CONCLUSIONS

A new concept of stent, the MFM* (without any covering) is developed to treat An. It opens a new approach to treat peripheral An. avoiding most of the complications encountered with current endovascular techniques. The results obtained seem promising. A larger study is ongoing.

CATEGORIES ENDOVASCULAR: Peripheral Vascular Disease and Intervention

KEYWORDS

Aneurysm, Multilayer Flow Modulator, Stent

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Renal Artery Aneurysms. First Human Treatment With The Multilayer Flow Modulator

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BACKGROUND

Renal Artery Aneurysms (RAAs) can be surgically treated but due to high risk, endovascular procedures have been proposed (coils, graft...). All these techniques have some drawbacks, potential complications and contraindications. We propose a new technique: the Multilayer Flow Modulator (MFM*), a self expandable.

METHODS

This MFM* is a 3D braided tube made of several interconnected layers without any covering. Our earlier tests, in vitro (theoretical simulation computerized Fluid dynamics, Molecular Modelization) & in vivo. demonstrate that this MFM* reduces the velocity in the aneurismal sac up to 90% by modifying the hemodynamic conditions. A saccular aneurysm (A.) without collateral branch will thrombose quickly. If a collateral branch is present the flow is directed towards this branch leading to shrinkage of the aneurysm. In fusiform A. the flow is laminated, the vortexes eliminated, eliminating the risk of rupture. Animal experiments show excellent results. Moreover, as demonstrated in animal and human studies this MFM preserves the collateral branches and increases the flow in them, allowing the possibility to cover any artery without compromising the flow.

RESULTS

9 RAAs (right: 6, left: 3) in 9 pts (male: 4) mean age 58 ± 10 years treated with MFM* 7 pts had atheromatous disease, 2 a fibromuscular dysplasia. One pt had a solitary kidney. All these pts had hypertension. 11 MFM*(Ø: 5 to 7 mm, length 30 to 60 mm) loaded in a 6 F sheath implanted by femoral approach through 8 F guiding catheter. These stents covered major renal branches without compromising the flow. Technical success: 100%. No complications. Immediately: important reduction of the velocities inside the aneurismal sac. 6 to 36 month follow up will be presented. All aneurysms thromboosed with diameter reduction in some pts. The thrombosis could take several weeks depending on the importance of collateral branches. All the side branches remained patent.

CONCLUSIONS

The MFM* is a new technique which seems promising to treat RAAs. Collateral branches can be covered without compromising the flow and risk of renal infarction. It is a safe procedure with a very low complications rate. Larger study is ongoing.

CATEGORIES ENDOVASCULAR: Peripheral Vascular Disease and Intervention

KEYWORDS

Angioplasty, Renal artery stenosis, Stent