Olgu Sunumu (Case Report)

Torakoabdominal Anevrizmanın Cardiatis Çok Katmanlı Akış Modülatörü ile Tedavisi

Treatment of a Thoracoabdominal Aneurysm with the Cardiatis Multilayer Flow Modulator

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Özet

Torakoabdominal aort anevrizmalarının perkütan tedavisi son yıllarda giderek daha fazla kullanılan bir tedavi yöntemi olarak karşımıza çıkmaktadır. Bu bağlamda, Cardiatis çok katmanlı akış modülatör stentleri kullanımının öne çıktığı göze çarpmaktadır. Cardiatis çok katmanlı akış modülatörü ile tedavi edilen torakoabdominal aort anevrizmalı olgumuzu sunuyoruz. 78 yaşında kadın hasta karın ağrısı şikayeti ile hastaneye başvurdu. Bilgisayarlı tomografide (BT) en geniş yeri 50 mm çapında olan abdominal aort anevrizması saptandı. Hasta cerrahiyi reddettiği için hastanın Cardiatis ile tedavi edilmesine karar verildi. Anjiyografik görüntüleme altında, 16x40, 16x80 ve 16x80 mm'lik üç Cardiatis çok katmanlı stent arka arkaya distal torasik aorttan 1 cm'lik bir over-lap olacak şekilde implante edildi. Kontrol anjiyografisinde stentin iyi bir pozisyonda olduğu ve anevrizmal segmentin tamamen kapatıldığı görüldü. BT taramasında, 6 ay ve 24 ay takip sürecinden sonra anevrizmanın gerilediği görüldü. Cardiatisin karmaşık anevrizmalar için kullanımı, etkinlik ve güvenilirliği tam olarak aydınlatılmadığı sürece tartışma konusu olmaya devam edecektir. Sonuç olarak, hastamızın başarılı ve hayat kurtarıcı tedavisine rağmen, karmaşık anevrizmalar için akış yönelimli stent kullanımı sadece tedavi alternatifi olmayan karmaşık anatomili vakalarla sınırlandırılmalıdır.

Anahtar Kelimeler: Cardiatis çok katmanlı akış modülatörü, Endovasküler tedavi, Karmaşık anevrizmalar

Abstract

Percutaneous treatment of thoracoabdominal aortic aneurysms have been increasingly used in recent years as a treatment method. The Cardiatis multilayer flow modulator (CMFM) stents have been used for aneurysms treatment. We present a case with the Cardiatis multilayer flow modulator in treatment of thoracoabdominal aortic aneurysms. A 78-year-old female patient applied to our hospital with abdominal pain. A computed tomography scan showed an aneurysm of the abdominal aorta with a maximal diameter of 50 mm. The patient refused open surgery, so we decided to treat the patient with Cardiatis. In an angiography, 16x40, 16x80 and 16x80 mm three Cardiatis multilayer stent were consecutively inserted with an overlap of 1 cm from the distal thoracic aorta. At control angiography a suitable position of the stent was observed and the aneurysmal segment was completely closed. A CT scan showed regression of the aneurysm with developing partial thrombus after the 6 month and 24 month follow-up process. The use of CMFM for complex aneurysms will stay as a matter of debate unless their safety and efficacy will be unraveled. In conclusion, even though the treatment of our patient has been succesful, the use of flow-diverting stents for difficult anatomical aneurysms should only be evaluated in cases with limited treatment options.

Keywords: Cardiatis multilayer flow modulator, Complex aneurysms, Endovascular therapy

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INTRODUCTION

Thoracoabdominal aortic aneurysms (TAAA) if untreated, the aneurysms may grow larger and cause death due to rupture (1). The main goal when treating TAAA is to prevent rupture and death (2). Percutaneous treatment methods have been increasingly used since they are shown to shorten the duration of intensive care and hospitalization and have lower rates of mortality and morbidity (3,4).

Flow-diverting stents have been developed to decrease flow rate in the aneurysm sac and establish thrombosis while preserve flow in the branch vessels and main artery. The Cardiatis multilayer flow modulator (CMFM) is a self-expanding, bare, and twisted wire tube of metallic cobalt alloy wire built in multiple interconnecting layers (5). Due to the absence of fenestrations or branches, there is no need for additional intervention of side branches, which might save radiation vulnarability, contrast amount, time, and costs (6). Recently, studies have been published about the promising treatment of the CMFM in juxtarenal aneurysms, visceral, peripheral, and complex TAAA (7). Our knowledge about the efficacy and the pretreatment with CMFM for aortic aneurysms are still insufficient. We present the case of TAAA treatmented with CMFM.

CASE PRESENTATION

A 78-year-old female patient, with a medical history of dyslipidemia and diabetes mellitus and was applied to our hospital with abdominal pain. A computerized tomography (CT) scan showed an aneurysm of the aorta, starting from the proximal segment of the abdominal aorta and extending pre-celiac trunk, with a maximal diameter of 50 mm **(Figure 1)**.

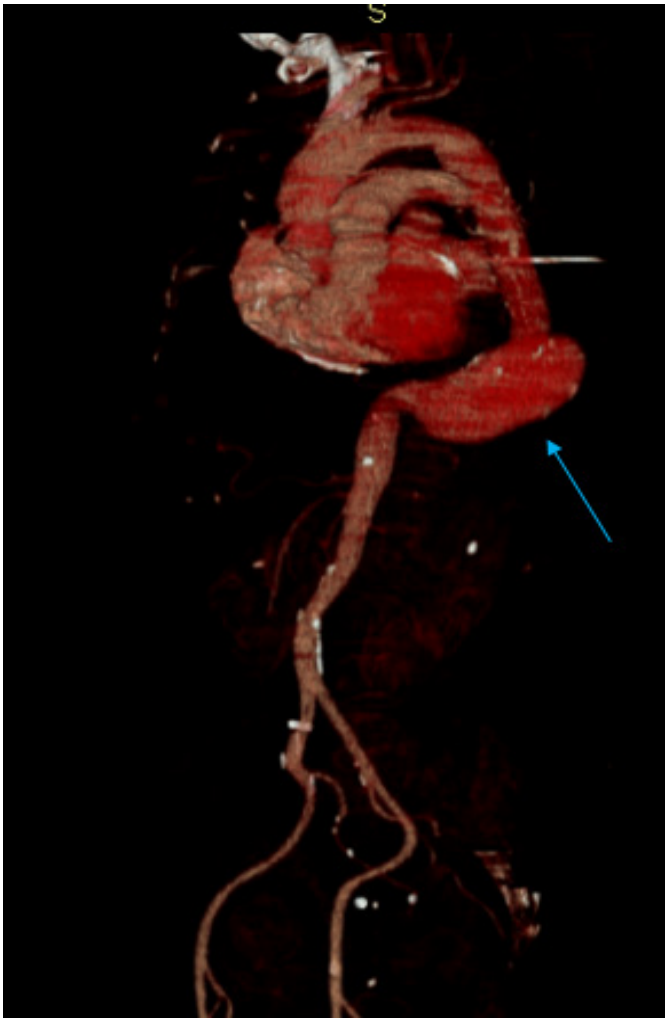

Figure 1. CT scan showed an aneurysm, starting from the proximal abdominal aorta and extending pre- celiac trunk

The patient refused open surgery, so we agreed on applying the patient a flow-diverting stent to maintain blood flow from the visceral arteries and decrease pressure from the aneurysm. A written informed consent form was obtained from the patient.

Percutaneous puncture of the right femoral artery was performed under local anesthesia, and then a 9-F sheath was deployed. The angiography showed voluminous thoracoabdominal aneurysms: aneurysms of the descending and suprarenal aorta. Then a 16x40, 16x80 and 16x80 mm three Cardiatis multilayer stent (Cardiatis SA, Isnes, Belgium) was placed successively with an overlap of 1 cm from the distal thoracic aorta to the infrarenal artery segment. At control angiography a suitable position of the stent was observed and the aneurysmal segment was completely closed **(Figure 2).**

Figure 2. Angiography showed a good position of the stent. Aneurysmal segment was completely closed.

The treatment lasted less than 55 minutes, and the sheath was removed after the end of 4 hours. The patient was discharged on postoperative day 2 with clopidogrel and acetylsalicylic acid medication. Six months after CMFM implantation, CT scan showed that the flow in the aneurysm and overstented branch arteries were preserved **(Figure 3).**

A CT scan showed regression of the aneurysm with developing partial thrombus after the 24 month follow-up process **(Figure 4)**.

DISCUSSION

A number of randomized studies have proven that thoracic endovascular aortic repair (TEVAR) and endovascular aortic repair (EVAR) in patients with proper aortic anatomy is reliable (8-11). Complex aneurysms are not suitable for "classical" TEVAR or EVAR procedures, but may be appropriate with flow-diverting stents. In our case, after stent implantation, the aneurysm has stabilized, indicating that the stent immediately decreased the pressure in the aneurysm. But a portion of the aneurysmatic segment continued in the middle part of the stent. During the follow-up, kidney function was preserved and the side branches remained patent.

The CMFM is a braided metal tube that is interconnected in multiple layers. Several randomized studies have proven how the flow-modulating principle of the multilayer stent functions based on both there are collaterals and whether or not the configuration of the aneurysm (12-14). Recently, multiple studies have been published about the CMFM but the majority is case reports includes the treatment of visceral and renal artery aneurysms, with only short-term follow-up (15,16). In the largest series so far, Ruffino and co-workers 5 at 12 different centers treated 19 patients with true visceral

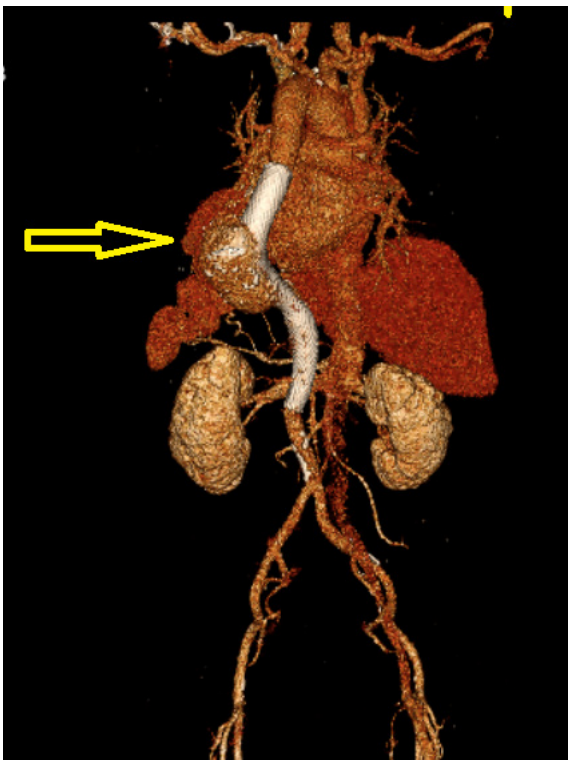

Figure 3. Six months after CMFM implantation, CT scan showed that the flow in the aneurysm and overstented branch arteries were preserved.

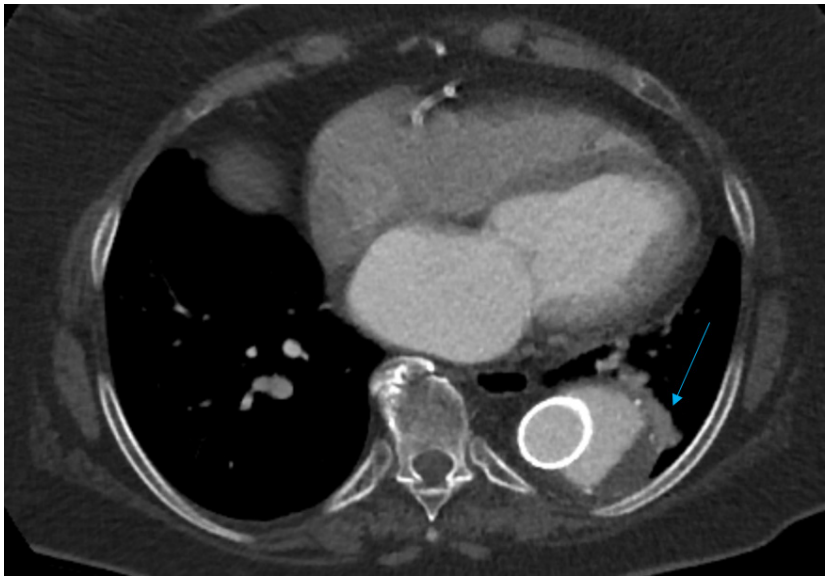

Figure 4. A CT scan showed regression of the aneurysm with developing partial thrombus after the 24 month follow-up process

aneurysms successfully, but 2 stent thromboses occurred within 1 month. At 6 months, the stent patency and aneurysm sac thrombosis rates were 87.5%. Preoperative sizing and planning, as well as the procedure itself, can and should be optimized before unrestrained release takes place. Besides, stent-related complications (e.g., component separation, thrombosis, and migration) may develop, although these risks may be limited due to the tube configuration and large diameters. The experience of a selected group of experts in overcoming the learning curve and possible stent-related complications is of most importance.

In conclusion, the use of the CMFM can be a simple and useful technique to treat complex TAAA. The successful treatment of complex aneurysm with the flow-diverting stents are limited only in cases without treatment options.

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Research Contribution Rate Statement Summary: The authors declare that, they have contributed equally to the manuscript.

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