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Case Report

Prosthetic Stent Graft Infection after Endovascular Abdominal Aortic Aneurysm Repair

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Abstract

Endograft infection is a rare event, with few reports in the literature.

Stent graft devices for endovascular aneurysm repair are packaged within a sterile sheath delivery system, thereby shielded from potential contamination at the time of implantation.

We report a delayed case of stent graft infection in a 63 year old male.

So far there is limited knowledge on infective post-EVAR complications, mainly due to either EVAR being a technique with low occurrence of infection, or to infections being under-reported in literature.

Keywords: EVAR; Aorta; Aneurysm; Infection; Endograft; Prosthetic

Introduction

Prosthetic aortic graft infection after open repair of abdominal aortic aneurysm (AAA) has been well reported during the last 3 decades with a range of clinical manifestations and therapeutic options [1], but infective complications involving endografts after endovascular aneurysm repair (EVAR) have received little attention. Most EVAR surveillance focuses on the technical aspects of the procedure, including endoleaks, device migration, neck dilation, and rupture [2-5]. So far, there is limited knowledge on infective complications after EVAR.

Presented for the first time by the Argentinean surgeon, Juan Parodi in 1990, the EVAR technique became a subject of great interest for the vascular surgeons all over the world. After endovascular aneurysm repair (EVAR) patients are followed up because of the risk of complications such as endoleaks, migration and structural defects of the graft. Available data regarding the infection of a stent graft indicate a lower risk compared to a Dacron prosthesis. The infection of an endograft may become a very serious complication when the bacterial contamination involves also the arterial wall. In such cases, disruption of the elastic layer at the level of the neck and the radial force of the stent may lead to dilation of the aorta, migration of the graft, and ultimately, AAA rupture may follow.

Since Chalmers., *et al*. [6] described the first case of an infected stent in 1993, more centers have reported graft related septic complications, usually in the form of single case reports. A recent multicenter retrospective study of 65 patients with infected endografts [7] failed to provide enough data for statistical analysis.

Stent graft devices for endovascular aneurysm repair are packaged within a sterile sheath delivery system, thereby shielded from potential contamination at the time of implantation.

Case Report and Surgical Technique

We present you the case of a 63 year old man who was hospitalized in our unit in January 2011, after being admitted in the

Emergency Service for fever 38.5 - 39 degrees Celsius, acute dyspnea, erythema of his left shank. The WBC count was 20000, CRP was 464 mg/dl. His heart rate was at 113/min, with no signs of myocardial ischemia, with normal arterial pressure, normal thorax radiography, no urinary infection. Constipation (3 days) and some inconstant abdominal pain were other complaints of the patient.

Our patient had all vascular risk factors present: arterial hypertension, diabetes, dyslipidemia, active tabagism.

Medical co-morbidities: Hypercholesterolemia, arterial hypertension, non-insulin-dependent diabetes type II, COPD caused by tobacco consumption Gold III, prostatic adenocarcinoma, myocarditis and cardiac decompensation episode, eczema.

Allergies: penicillin, cephalosporin, latex.

In May 2006 the patient underwent uneventful endovascular repair of an inflammatory AAA using an aorto-biiliac Anaconda covered stent graft.

Between August 2006 and October 2009 he benefited from multiple percutaneous angioplasties by a cutting balloon and stenting of both left and right superficial femoral arteries.

Between January and February 2010 he presented two abscesses in the left shank with an infection of the stent, septicemia with Staph Aureus and septic macroemboli. We proceeded to scintigraphy with antigranulocyte which showed an abnormal capitation at the level of the EVAR site. The patient was administered antibiotic treatment (Vancomycin-Rifampicin) and the subsequent control scintigraphy, one month later, did not detect any abnormal capitation on the EVAR site.

The stent was removed, the abscess was drained and a femorotibial venous by-pass replaced the resected normal anatomy.

The patient was hospitalized again on 4 January 2011 in our unit for the investigation of his important inflammatory syndrome.

The scintigraphic reevaluation of the EVAR showed once again a capitation anomaly.

CT-scans were performed and showed the development and a retroperitoneal collection increasing from a CT-scan to another (Figure 1).

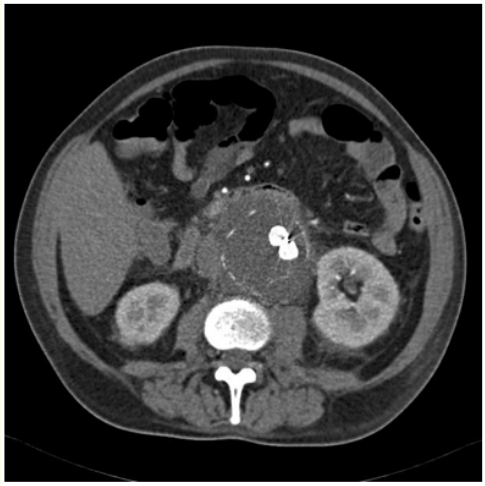

Figure 1: The development and a retroperitoneal collection increasing from a CT-scan to another.

In the meantime the clinical condition was not ameliorating, the patient presenting fluctuant fever and increasing abdominal pain.

The inflammatory syndrome observed in the blood examinations was not regressing.

The patient was developing a septicemia.

We decided to operate our patient on 13 January 2011.

We proceeded by a right axillo-femoral and right-to-left femoro-femoral by-pass with tunneling in the subcutaneous prepubic fat. We chose not to enter the Retzius space because of the untreated prostatic adenocarcinoma.

The second step of the operation was the removal of the endoprosthesis. The abdominal aorta was accessed by a xipho-umbilical incision. Afterwards we dissected the aneurismal aortic neck. It was impossible for us to isolate the iliac arteries due to the presence of extreme fibroses.

The aorta was clamped with a straight clamp.

We visualized the endoprosthesis that was floating in a purulent liquid (Figure 2). The prosthesis was extracted (Figure 2 and 3) and the aorta and the iliac arteries were ligated, using two knots of Surgilon 2. An epiploplasty was performed at the site of the aortotomy.

Figure 2: Aortotomy and visualization of the prosthesis and the periprosthetic infected liquid.

Figure 3: Extraction of the prosthesis.

The operation lasted 10 hours with an operative blood loss of 2000 ml. Seven units of blood were transfused - we used the cell-saver. No drains were left in the abdomen.

The evolution was favourable during the next days. The patient did not present fever. The regression of the inflammatory syndrome was ascertained.

The patient was successfully extubated on 28 January 2011 (14 days post op).

The laboratory findings on the microbiological cultures of the thrombi and the periprosthetic and abdominal liquid showed the presence of a multi-sensitive Streptococcus beta-hemolytic group A.

In the immediate post operatory surveillance we observed anurea and renal insufficiency treated by conventional hemodialysis 3 times a week, confusion and paralysis of his right leg.

The confusion persisted during all his hospitalization period at the ICU Saint-Pierre.

Ischemic colitis observed since day 2 post-operatory, treated by total parenteral nutrition and then progressive enteral alimentation.

The CT scan performed the 01 February 2011 showed the permeability of the bypass axillo-femoral, the stenosis of the right renal artery and of the superior mesenteric artery, ischemic modifications of the left.

On 02 March 2011, the patient was transferred in a stable state to a chronic dialysis unit.

The confusion state disappeared with no treatment on the 33rd day after the operation.

Discussion

Endovascular repair may be preferable in patients with favourable anatomy who are at high level of perioperative risk.

Endovascular repair may be considered in patients with favourable anatomy who are not at high surgical risk, but the long-term benefits and risks are not as well established in this setting.

Several mechanisms have to be considered for the occurrence of graft infection.

First, the infection may be related to the implantation procedure.

The second mechanism may be related to mechanical irritation of the surrounding tissue by the stent-graft causing erosion of the aortic wall and the development of an aorto-enteral fistula.

It might be speculated that bacteremia during the bowel resection procedure may have led to a late infection.

Open surgical repair may be preferable for younger patients who have a low or average perioperative risk.

Endovascular repair may be preferable in patients with favourable anatomy who are at high level of perioperative risk.

Endovascular repair may be considered in patients with favourable anatomy who are not at high surgical risk, but the long-term benefits and risks are not as well established.

Guidelines from major medical and surgical societies recommend an individualized approach to the patient when choosing between open and endovascular repair taking into account the patient's age, risk factors for perioperative morbidity and mortality, anatomic factors, and experience of the surgeon [4-6].

Conclusion

Complete graft removal including the debridement of infectious peri-aortic tissue is the preferred treatment. The restoration of the aorto-iliac route is a controversial issue, with either an axillo-femoral bypass procedure followed by excision of the infected graft or an orthotopic revascularisation after the excision. Following stent graft prostheses removal, in situ autogenous aortic reconstruction with cryo-preserved allografts and/or superficial femoral-popliteal vein (SFPV) or heterologous prostheses (bifurcated Rifampicin-impregnated Dacron graft or PTFE) has been performed. As an additional maneuver, the in situ prosthesis may be wrapped in retroperitoneal and omental tissue.

In conclusion, stent graft infection seems to be rare, but is probably underrepresented in the literature. Skin contamination during stent graft insertion or transfemoral interventional procedures require sterile handling, and it seems reasonable to give prophylactic antibiotics not only during stent graft deployment, but also in case of secondary intervention. Prophylactic antibiotics should be given if the patient requires another unrelated operation to prevent hematogenous bacterial graft seeding. If stent graft infection is suspected, the therapeutic strategies are similar to those in graft infection following conventional aneurysm repair.

So far, there is limited knowledge on infectious complications after EVAR. This can be for two reasons: either the EVAR is a technique with low occurrence of infection or the infections are underreported in literature [3,7].

Nevertheless, this is an issue that leaves place to further studies and ever changing guidelines with the changes of the techniques and the prosthetic materials to come.

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