CASE REPORT

An unusual case of late anastomotic disruption of Dacron Aortic prosthesis

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ABSTRACT
BACKGROUND: We report a case of a late anastomotic disruption between tube graft and Y graft without structural failure following an ascending aorta to bilateral femoral Dacron graft in a 56 years old man who presented with two pulsatile swellings on anterior abdominal wall 10 years after surgery. Upon re-exploration, both the grafts were found disconnected from each other, a tough fibrous sheath surrounding the graft acted as blood conducting channel. Two perigraft hematomas were found, with no gross infection. In view of pulsatile back flow from distal anastomotic site, the Y graft was removed and ends closed with continuous sutures.

INTRODUCTION
Occlusion, anastomotic pseudoaneurysms and infection are the main known late complications of arterial grafts. In the vascular literature dilatation and aneurysms of grafts and graft rupture have been described when long term follow-up had been carried out. We present a case report of late Dacron aortic graft to graft anastomotic rupture without gross extrinsic etiologic factors. Diagnosis of the complication was difficult to judge by clinical examination and imaging studies.

Case history
A 46 year male patient was operated for ascending aorta to bilateral femoral bypass graft using two Dacron woven grafts, one from the ascending aorta up to lower border of sternum (a Dacron 16 mm tube graft) and another Y graft (a Dacron 16 x 8 x 8 mm) in continuity from previous graft to bilateral femoral arteries along with coronary artery bypass graft (Left Internal Mammary Artery (LIMA) to Left Anterior Descending (LAD) and reversed Saphenous Vein Graft (rSVG) to Obtuse Marginal (OM)). 10 Years later, the same patient presented with two swellings on anterior abdominal wall since last 2 months, gradually increasing in size. On examination, two pulsatile swellings, first a globular one about 6 x 6 cm sized on the midline at supra-umbilical region, second a similar 5 x 4 cm sized, just left to the umbilicus, were identified. Distal pulsations were present up-to bilateral popliteal arteries; limb was warm without signs of ischemia. Two years back, in routine follow up visit, few distal ischemic complains were noticed in the left lower limb, patient examined and managed conservatively. At that time no such swellings were noticed on the abdomen. Patient was found to be hypertensive with systolic blood pressure of 160 mm Hg with heart rate of 88/min. Laboratory results showed hemoglobin 12.7 g/dl, total leukocyte count 6700/mm³ and platelet count of 3,30,000/mm³. Computed Tomography (CT) angiogram (figure 1A and 1B) showed dilatation and redundancy of aorto-bifemoral prosthesis starting from sub-sternal area to the bifurcation of Y graft. An area of the graft was kinked upon itself in the supra-umbilical region. It appeared that graft has given up its structural strength, elongated, dilated and kinked then after. Multiple perigraft hematomas were identified without active contrast leak (Figure 1C and 1D).

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Figure 1 – 1A and 1B, shows CT images dilatation and kinking of the graft starting below the xiphoid process; 1C, white arrow shows perigraft hematoma around kinked graft; 1D two white arrows show perigraft hematoma in the left limb of Y graft Re-operation was decided with revision of aorto-bifemoral graft. Intraoperatively, we found both the grafts disconnected from each other. The kinked portion of the graft seen in figure 2A and 2B (white arrows) was actually dislodged graft.

Figure 2A and 2B - The kinked portion of the graft shown as white arrows was actually dislodged graft. The empty space between two grafts shown as black arrows was surrounded by a tough fibrous sheath which acted as blood conducting channel The empty space (figure 2A and 2B - black arrows) between two grafts was surrounded by a tough fibrous sheath which acted as blood conducting channel (figure 3A and 3B).

Figure 3 - 3A, drawing of grafts at time of implantation; 3B, drawing of intraoperative finding while removing graft shows totally disconnected grafts, a fibrous sheath (four black arrows) around the graft was acting as blood conduction channel, thick black arrow shows dislodged graft, perigraft hematomas are also marked in figure Around kinked portion, and at several other sites, there were multiple old perigraft hematomas without any gross infection. There was a good pulsatile back flow at the distal femoral anastomotic sites, hence graft was detached from the femoral sites and proximal sub-sternal end was closed by running sutures. It was noteworthy that structural integrity of the graft was maintained without any aneurysmal changes, only anastomotic disruption was identified. Microscopy was positive for several pus cells without gram staining of bacteria but culture showed staphylococcus aureus.

DISCUSSION

Although relative frequency of Dacron graft complications has significantly diminished with the improvement of sutures and prosthetic materials, the problem is becoming more important with the increasing number of bypass procedures. The factors leading to the graft failure include: infections, bleeding, thrombosis, anastomotic pseudoaneurysm, primary structural defect. Among these, graft thrombosis and anastomotic aneurysm(0.5 to 4%) are most common complications of such a graft. The etiology of false aneurysms seems in fact to be multifactorial, major factor being arteriosclerotic degeneration of native vessel. Compared with healthy arteries, the elasticity of degenerated vessels is much diminished by atherosclerosis leading to a rigid tube which loses its biomechanical compliance. Since there was no native tissue in-between, we suspect flow turbulence must have played role in pathogenesis.

Mechanical stress, especially tension in the direction of the vascular axis, seems to play an important role, as suggested by the high rate of anastomotic aneurysms in the vicinity of joints particularly in the
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Inguinal region. Discrepancy in the diameters of graft and host artery, inappropriate angle of incidence in the end-to-side anastomosis, dilatation of the prosthesis or the anastomosis leads to disturbance in laminar blood flow. Flow turbulence produced by diameter difference may produce stress on the suture line, leading to suture disruption or pressure necrosis of the arterial wall. Szilagyi in his classic study reports that hypertension is a major predisposing factor in patients with anastomotic aneurysms while others deny. In our knowledge, late graft to graft anastomotic rupture with maintained structural integrity has not been reported and is a rare event. Since there was no graft wall weakening, we suspect an anastomotic leak to initiate the event and its consequences, leading to a pseudoaneurysm formation initially, followed by formation of tough fibrous sheath and later the anastomotic dehiscence. Since culture was positive for Staphylococcus aureus, we cannot deny its role in pathogenesis.

REFERENCES