SECONDARY AORTOENTERIC FISTULA WITHOUT PERIGRAFT INFECTION FOLLOWING A REOPERATION

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SUMMARY
Secondary aortoenteric fistula and perigraft infection are rare but devastating complications of prosthetic aortic reconstruction. In addition to difficulties in diagnosing these complications, significant mortality and morbidity despite of advanced treatment modalities are still challenging for surgeons. Revascularization with extra-anatomic bypass prior to total excision of the graft is recommended by most authors especially in the presence of frank graft infection. There are also reports about successful local repair or graft replacement in patients with aortoenteric fistula involving the suture line and with minimal infectious elements. We report a 66-year-old man with secondary aortoenteric fistula without perigraft infection which developed 12 days after the second aortobifemoral bypass grafting for graft occlusion. The difficulties in diagnosis and treatment of this complication are discussed. Secondary aortoenteric fistula must always be remembered as a cause of hemoglobin decrease in aorta reconstructions in reoperations and bowel wall must be protected not to come in contact with the prosthetic graft in order to prevent this complication.

Key Words: Aortobifemoral Bypass Grafting, Secondary Aortoenteric Fistula

ÖZET
Reoperasyon Sonrası Perigraft Enfeksiyonu Olmadan Gelisen Sekonder Aortoenterik Fistül

Sentetik greft ile yapılan aorta rekonstrüksiyonlarının nadir ama önemli komplikasyonları olan sentetik aortoenterik fistül ve perigraft enfeksiyonlar hemen her zaman birlikte görülürler. Tanı konulmasında karşılaşılan güçlüklerin yanı sıra cerrahi olarak üstesinden gelinmesi zor, mortalite ve morbiditesi yüksek kompleksiyonlardır. Enfeksiyon lehine bulgular tespit edildiğinde, greft eksizyonundan önce ekstra-anatomik bypass ile revaskülarizasyon önerilmektedir. Enfeksiyonun sırını kaldığı ve sadece anastomoz hattını ilgilendiren aortoenterik fistül vakalarında ise, başarılı lokal onarımlar da greft replasmanları bildirilmiştir. Greft tikanığı nedeniyle, reoperasyona alınan ve ikinci kez aortobifemoral greft konan 66 yaşında bir erkek hastada, 12 gün sonra perigraft enfeksiyonu olmadan gelisen sekonder aortoenterik fistül bildirilmiş ve tanı ve tedaviye karşılık gelen güçlükler tartışılmıştır. Sekonder aortoenterik fistül, aorta rekonstrüksiyonlarından sonra görülen hemoglobin düşüşünün nedeni olarak her zaman akılda tutulmalıdır; aortik reoperasyonlarda, bu ağır kompleksiyondan kaçınmak için barsak duvarı ile greftin yakınlanması önemlidir.

Anahtar Kelimeler: Aortobifemoral Bypass, Sekonder Aortoenterik Fistül

Aortoiliac and aortofemoral bypass grafting are widely used operative treatment modalities of aortic reconstruction for both aortic occlusive disease and aneurysms of abdominal aorta. Graft occlusion, pseudoaneurysm formation, aortoenteric fistula and perigraft infection are the late complications of aortic graft surgery. Late graft occlusion is by far the most common encountered complication, reported as 10% in many studies (1). Aortoenteric fistula with or without perigraft infection, on the other hand is a rare but devasting complication with high mortality and morbidity rates. In most series the incidence of aortoenteric fistula is reported as 2% (2). Mortality rates ranging from 30 to 70% have been reported in different series with overall operative mortality of 50% (3,4).

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In 1956, Claytor et al reported the first secondary aortoenteric fistula following the reconstruction of the abdominal aorta with a prosthetic graft (5). Since then, secondary aortoenteric fistula has been a challenging problem of diagnosis and treatment for the surgeons. Mac Kenzie et al described the first successful repair of a secondary aortoenteric fistula in 1958 (6). In 1974, Szilagi defined aortoenteric fistula and paraprosthetic fistula as two separate entities which had differences in both clinical presentation and management (7). A communication between the suture line and the intestine was termed as an aortoenteric fistula and local contamination of a graft with intestinal erosions was named as paraprosthetic fistula. Aortoenteric fistulae often present with acute onset gastrointestinal bleeding whereas paraprosthetic fistulae which are basically low grade infections, may occasionally progress to frank graft infection and sepsis (8). High mortality of this complication suggests aggressive treatment. These patients are advised to be managed by total graft excision, segmental resection of the intestine, and extra-anatomic bypass (9). Trout has suggested that whenever graft infection was apparent, extra-anatomic revascularization of lower extremities prior to graft excision could lead to more favourable outcome (10). Outcome with graft preservation and in situ replacement have been reported to be poor. High mortality about 70 to 90 % was thought to be unacceptable. Patients died because of persistent sepsis and recurrent aortoenteric fistulae. More recently Thomas and Baird, and Walker and Cooley presented their experience about patients with aortoenteric fistula involving suture line (11,12). Their results are encouraging for more conservative management in selected patients.

CASE REPORT:

A 66-year-old man had been operated for aortic occlusive disease 11 years ago and underwent aortobifemoral bypass grafting with end-to-side proximal anastomosis. He had also undergone coronary artery bypass grafting 5 years ago. He was suffering from claudication but no further ischemic complaints. Both femoral pulses were diminished and more distal pulses were absent. An aortofemoropopliteal digital subtraction angiography was performed via axillary route. Both limbs of the aortic graft was seen to be occluded. Graft replacement was planned. Occluded graft (Meadox woven double velour - Meadox® Vascular Prosthesis, Boston, USA) was excised leaving proximal aorta-graft end-to-side anastomosis in place and a new prosthetic graft (knitted polyester vascular prosthesis coated with bovine collagen - Cardial Prothèse Dialine® II, Saint-Etienne, FRANCE) was anastomozed to the remnant of the former graft with end-to-end technique. Bilateral femoropopliteal bypass was also performed. The patient had an uneventful early postoperative period but twelve days after the operation, he presented with mild abdominal pain. He had voluntary rigidity but no rebound pain. Blood pressure was 90/60 mmHg and heart rate was 110/min. On laboratory examination, hemoglobin level was 8 mg/dL, hematocrit was 26 %, WBC count was 5 thousand/mm3. Nasogastric tube irrigation was clear and rectal examination did not suggest gastrointestinal bleeding. Plain abdominal x-ray did not show any pathognomonic sign. Hemoglobin level decreased to 7 mg/dL despite of blood transfusion. Abdominal ultrasonography was normal except a few fluid filled bowel loops. Peritoneal cavity was free of fluid. Aortic graft and perigraft area was normal. First upper gastrointestinal tract endoscopy revealed gastritis and focal gastric bleedings and behind pylorus could not be visualized because of hematoma. The amount of gastric bleeding seemed to be far below to explain the decrease in hemoglobin level. The aortic graft was shown to be patent by intra-arterial digital subtraction angiography. No extravasation of radiopaque material could be visualized (fig. 1,2). Conservative therapy was applied. After 6 hours, during the second endoscopy, massive bleeding began (due to peeling of hematoma in pylorus). Finally exploratory laparotomy was performed. A connection between the suture line of the former graft and duodenum was found out when duodenum was incised for any ulcerative formations. There was no evidence of frank...
infection around the anastomosis. Duodenal wall erosion was the only finding. Samples for bacterial cultures were obtained. The aorta and the graft was sutured primarily and the duodenum was repaired with tube duodenostomy. The anastomosis was reinforced by an omental wrap. Laparotomy was closed with Bogata bag. Unfortunately disseminated intravascular coagulation developed and the patient died on second postoperative day as a result of cardiac complications.

**DISCUSSION:**

Aortoenteric and aortic paraprosthetic fistulae are devastating, late complications in vascular surgery. The interval between initial operation and the onset of symptoms of aortoenteric fistula varies from 2 weeks to 8 years (average 2.8 years) (13). In our case, symptoms of AEF became manifest on postoperative 12th day.

Most authors recommend total excision of the graft and revascularization of the lower extremities by extra-anatomic bypass, if there is an evidence of graft infection (8). In our case, the patient did not have clinical and operative evidence of overt graft infection so he was treated by local repair. The patient was under postoperative wide spectrum antibiotic treatment. An infection had to be ruled out and negative cultures of the specimens confirmed this. We considered the probability of AEF when hemoglobin level began to decrease and all the techniques which were recommended for the diagnosis of AEF in the literature were used except CT and gastrointestinal barium contrast study. The presence of periaortic gas or black dots in CT has been proven to be a specific sign of a paraprosthetic-enteric fistula (14) and in the literature CT can help to detect either complication (PGI and AEF) (15). In the present case, CT was not used for evaluating the patient at the very beginning because aortic graft infection and fistula were not suspected to be the first probable complication. Hemodynamic instability of the patient did not permit performing a gastrointestinal barium contrast study. If the correct diagnosis could be defined before the patient deteriorated, operative result

**Figure 1:** Intra-arterial digital subtraction angiogram showing no extravasation in antero-posterior position.

**Figure 2:** Intra-arterial digital subtraction angiogram showing no extravasation in lateral position.
could be successful. Actually, the time passed between the two endoscopies which ultimately led to an explorative laparatomy was only 6 hours.

The etiology of complications following aortic reconstruction with prosthetic grafts, particularly aortoenteric fistulæ and paraprosthesis erosions is still controversial. The majority of fistulæ and erosions following grafting with synthetic material develop as a communication with the third portion of duodenum. Direct contact between synthetic graft and bowel wall, which predisposes to enteric erosion, can be prevented by the use of techniques such as suturing and wrapping periaortic tissue or aneurysmal wall around the graft and interposing a viable omental pedicle between prosthesis and bowel wall (13). In our case, following the dissection and exploration of the former occluded graft, the graft was incised and thrombotic debris was removed, fibrotic tissue around the anastomosis was peeled out, and the anastomosis was fully exposed. New prosthetic graft was anastomosed end-to-end with the former graft (leaving one cm. rim of the former graft in place). Since it was a reoperation complete closure of the retroperitoneum could not be possible. AEF developed between duodenum and suture line of the graft-aorta anastomosis. The aged, hardened graft with sharp edges seemed to erode the duodenal wall because of mechanical friction.

CONCLUSION:

Secondary aortoenteric fistula is a rare and in many instances mortal complication of prosthetic aortic reconstructions. It can develop at any time during early and late postoperative period. Difficulty in its diagnosis is a well known feature. The most important tool for diagnosis is probably the clinical experience and suspicious attitude of the surgeon. Yet, it is not possible to demonstrate a fistula in every case even if a surgeon keeps it in consideration.

Surgical techniques certainly help to lower the incidence of fistula formation. Retroperitoneal portion of the duodenum is by far the most common site of the fistulae. Complete closure of the retroperitoneum is essential in prevention of such complication. Cases in which total closure can not be possible, are mostly reoperations as in our case. In such conditions omental wrap is useful to keep the aorta and the graft material apart.
REFERENCES


