An Overview of Aortofemoral Graft Infection

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Infection of an aortoiliac prosthesis constitutes a major complication in vascular surgery, not only prolonging hospitalisation of the patient but also leading to limb loss or even death, with mortality rates ranging between 25 and 88%. This infection is a nightmare for the vascular surgeon, often necessitating repeated procedures with an unpredictable outcome, and serious consequences such as massive wound or intra-abdominal bleeding.

I first became aware of the severity of this complication after reading the classic paper of Shaw and Bane when I was a trainee in Houston, Texas in 1962. Dr DeBakey warned his residents and fellows that infection was a hell in vascular surgery, and for this reason he insisted on maintaining strict surgical techniques, starting with prepping of the patient. Later, when I started my own practice I faced this terrible problem from time to time. In one case 12 vascular procedures were performed after an infected aortobifemoral polytetrafluoroethylene (PTFE) bypass and the patient finally died of massive bleeding.

The incidence of infection in reconstructive arterial procedures ranges from 0.8 to 4.1%.

Early infection during the 30-day postoperative period is more common than delayed infection, reaching an incidence of 90–96% in some series.

Groin wound infection is easily suspected or recognised, while retroperitoneal infection is difficult. The infective process in the retroperitoneal space remains clinically silent, sometimes for a long time. Although there may be a low grade fever with a moderate increase of leucocyte count, all other laboratory investigations may be normal. In such cases our practice had been to insert an intra-arterial catheter into the graft, taking blood samples at various levels including the anastomotic sites. The results were disappointing, because in three cases with early proven infection of the aortic graft the cultures were negative in all the samples. Sometimes a low grade infection, without any clinical sign and symptom and any abnormal laboratory findings, erodes the aortic suture line and the duodenum or intestinal wall leading to the development of an aortoenteric fistula, with intermittent upper gastrointestinal bleeding as the only clinical finding, which appears as haematemesis and/or melaena. In these cases a high index of suspicion of this complication, after excluding active bleeding from a gastroduodenal ulcer by gastroscopy, dictates early surgical exploration before massive bleeding occurs, jeopardising the patient's life. Experience has shown that long delay whilst attempting local control of infection is not justified. A decision should be taken early for radical surgical treatment to eradicate infection, which can be accomplished only with a removal of the infected graft and the performance of another, more extensive and severe, reconstructive arterial procedure with a higher morbidity and mortality compared to the primary one. The earlier the intervention, the lower the morbidity and mortality. In proceeding with this radical procedure the vascular surgeon should make proper plans for effective revascularisation of the lower extremities, avoiding at any cost contamination of the new prosthesis. If this is not feasible, one could take the risk of restoring blood flow to the lower extremities through the contaminated area after general debridement, using an autologous arterial conduit or even a new prosthesis.

In situ graft replacement has recently been proposed as an option for the treatment in selected patients. In these cases the area of arterial reconstruction should be covered with viable tissues having an abundant blood supply, such as omentum for the retroperitoneal area and by swinging neighbouring muscles over the groin wound after extensive debridement. This last
technique has given excellent results in our department in five cases with extensive infection involving the arterial prosthesis in the groin, which was exposed after infective destruction of the skin and the subcutaneous tissues, leaving a large defect.

Established vascular surgeons are only too aware of these ideas and concepts; nevertheless, it must be stressed to trainee vascular surgeons that the prevention of infection has to be one of their many concerns when performing vascular procedures. For this reason the following measures should be taken:

1. Eradication of any generalised and focal infection prior to prosthetic arterial reconstruction whenever possible.
2. Correction and all metabolic and nutritional disturbances of the patient.
3. Strict preparation and draping of the patient in the operating theatre.
4. Strict asepsis during the surgical procedure, with a no-touch technique where possible.
5. Gentle handling of the vessels and surrounding tissues, avoiding injury to the visceral organs, and careful haemostasis to avoid haematomas. Control of any periaortic lymph drainage and avoidance of destruction of lymph nodes in the groin.
6. Careful closure of the retroperitoneal space, the abdominal and groin wounds.
7. Prophylactic chemotherapy for up to 24 h, starting 1 h before skin incision.

References