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Hybrid operations in obstructive atherosclerosis of the aorta and lower limb arteries

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Aims

The aim of this study was to improve the efficiency and to decrease the severity of operation on the aorta and lower limb arteries (LLA) by combining the best results of open and endovascular surgical procedures.

Methods

Over the last 24 months, we performed 40 hybrid vascular reconstructions (in 10 females and in 30 males). The average patient age was 65.1 ± 8.6 years. Fifty per cent of patients suffered from Fontaine stage IIb chronic ischaemia, 18% from stage III and 32% from stage IV. The nodal point in planning a hybrid operation was the zone of bifurcation of the common femoral artery. First, with this access point it is easy to carry out both open and endovascular procedures in the proximal and in distal directions. Second, this arterial segment is more effectively treated by open surgery. We classified the hybrid operations into three types:

- Type 1: Hybrid reconstruction of aorto-femoral segment. Open reconstruction of common (CFA) and profunda femoral artery (PFA) + common iliac artery (CIA) stenting. In this operation, an open angioplasty (OAP) creates an adequate outflow and an endovascular procedure (EVP) creates an adequate inflow.
- Type 2: Hybrid reconstruction of the femoropopliteal segment. Open reconstruction of CFA and PFA + endovascular angioplasty of the superficial femoral, popliteal and tibial arteries. In this operation an OAP creates an adequate inflow and EVP an adequate outflow.
- Type 3: Hybrid reconstruction of both (type 1 + type 2) segments. Open reconstruction of CFA and PFA + CIA stenting and endovascular angioplasty of the superficial femoral, popliteal and tibial arteries. In this operation an OAP of CFA + PFA serves as a link between the created endovascular procedures adequate inflow and outflow.

Results

We performed 12 type I, seven type II and 21 type III procedures. Mean operative time was 196.7 ± 72.7 minutes, but the duration was significantly higher in those patients who underwent a second reintervention on LLA (11/40). Primary technical success was 100% for all types. Within 30 days after surgery there were no deaths in patients with stage IIb ischaemia, as in critical limb ischaemia. In three cases (10%) patients required reintervention within the first seven days with good results after reintervention. Primary patency at three months was 100%, at six months was 100% and at 12 months was 97% in all groups of patients. Limb salvage was 100% after 24 months of observation. No statistically significant differences between groups were found.

Conclusions

Hybrid technology can reduce trauma and improve the results of reconstructive vascular interventions, reduce the risks of surgery, and allow these operations to be performed on patients with severe comorbidities. The emergence of hybrid techniques in reconstructive vascular surgery opens up new horizons in the treatment of ischaemia of the lower limbs.