Prosthetic vascular graft infections (VGI) are unknown but devastating complications in reconstructive vascular surgery (Seeger 2000). Diagnosis of VGI can be difficult given that the symptoms are often non-specific, and their detection by conventional radiographic methods could be difficult, although computed tomography (CT) and labelled leukocyte scintigraphy, using either $^{99m}$Tc or $^{111}$In, have been shown to be useful tools in the diagnosis of VGI (Modrall et al. 1999). However, there are very few comparative studies on the clinical usefulness of the CT and leukocyte scan in the diagnosis of VGI (Mark et al. 1985; Cerqueira 1992; Ramo et al. 1993; Delgado et al. 1999).

The organisation of this round table has given us the opportunity to pool the results obtained separately in this field by the University of Rome La Sapienza and the University Hospital of Zaragoza and to present them as a single retrospective study.

On this context, the aim of this presentation has been to evaluate and compare the results obtained using the $^{99m}$Tc-HMPAO-labelled leukocyte scan and CT in the diagnosis of VGI.

On this study we have included 48 $^{99m}$Tc-HMPAO-labeled leukocyte scans and CT studies performed in 46 patients (45 males and 1 female) ranging in age from 48 to 80 years (mean, 66 years), with clinical suspicion of VGI infection. Twenty-six examinations were performed at the University Hospital of Zaragoza and 22 at the University of Rome. The type of the prosthesis included 32 aorto-bifemoral, 5 aorto-aortic, 5 axilo-femoral, 2 aorto-femoral, 1 aorto-iliac, 1 ilio-femoral, 1 ilio-popliteal and 1 femoro-femoral. The interval between surgery and $^{99m}$Tc-HMPAO/CT studies ranged from 14 days to 12 years. Six studies were performed within the first month of the postoperative period. The interval between the HMPAO scan and the CT was never greater than 7 days.

Mixed leukocytes were labelled with $^{99m}$Tc-HMPAO according to the ISORBE method. After injection of 148–185 MBq of $^{99m}$Tc-labelled leukocytes, we obtained scintigraphic images at 30 min, 3 h and, occasionally, delayed images at 6–8 h. Delayed images were systematically performed in all studies carried out in extra-anatomic superficial grafts. If we knew or suspected the presence of pseudoaneurysms a dynamic study, or an early image at 5 min, was also performed.

Persistent increasing uptake along the expected area of the graft was considered evidence of vascular graft infection on the leukocyte scan, whereas a CT was evaluated as positive only in the presence of direct signs of infection, such as
perigraft fluid and/or gas collection, while the presence of minor signs such as pseudoaneurysm, thrombosis, thickened wall, etc. were not considered as indicative of graft infection. Leukocyte scans and CT were evaluated by radiologists and nuclear physicians who were unaware of the results of other studies and of the final diagnosis.

Final diagnosis was confirmed by Gram staining and cultural examination in patients who underwent surgery and by an 18-month clinical follow-up in the other cases.

Prosthetic vascular graft infection was present in a total of 24 studies, whereas the other 24 grafts were considered to be sterile. All cases of infected graft were detected on $^{99m}$Tc-HMPAO-labelled leukocyte scans (24 TP). Of the 24 sterile grafts, the leukocyte scan was normal in 23 studies (23 TN) and abnormal in one study (1 FP). No false-negative studies (FN) were found on leukocyte scans. CT study was considered suggestive of VGI in 15 cases of graft infection (15 TP) and in 4 sterile grafts (4 FP), whereas it was considered non-suggestive of VGI in 20 sterile grafts (20 TN) and in 9 infected grafts (9 FN). It is important to con-

Fig. 20.1. Peripheral fluid collection with small gas pockets clearly indicating the presence of infected aorto-bifemoral graft on CT study (a). Leukocyte scan (b) shows increased uptake of the cells along the prosthesis