

Intrathoracic mycotic aneurysm detected by indium-111 labelled autologous neutrophils with single photon emission computed tomography

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Scintigraphy using neutrophils labelled with indium-111 (^{111}In) has been shown to be a reliable method of detecting occult infection,¹ particularly within the abdominal cavity.^{2,3} We report a case in which an intra-abdominal source of infection was suspected but a labelled neutrophil scan showed the site to be an intrathoracic mycotic aneurysm, which was subsequently confirmed at thoracotomy.

Case report

A 63 year old woman was admitted to hospital for the investigation of a discharging sinus in the left iliac fossa. Eighteen months previously a Hartmann's procedure had been performed for a peridiverticular abscess and one month before this a right aorto-femoral graft and femoro-femoral crossover graft had been performed for severe peripheral

vascular disease. On admission the patient was febrile (38°C) and abdominal examination showed previous operative scars, with a discharging sinus in the left iliac fossa. The remainder of the clinical findings were entirely normal. Apart from a slightly raised leucocyte count ($11.2 \times 10^9/\text{l}$) and a growth of *Staphylococcus aureus* from the sinus discharge fluid, routine investigations all gave normal results. A sinogram failed to show any communication between the sinus and the bowel. A right transfemoral angiogram

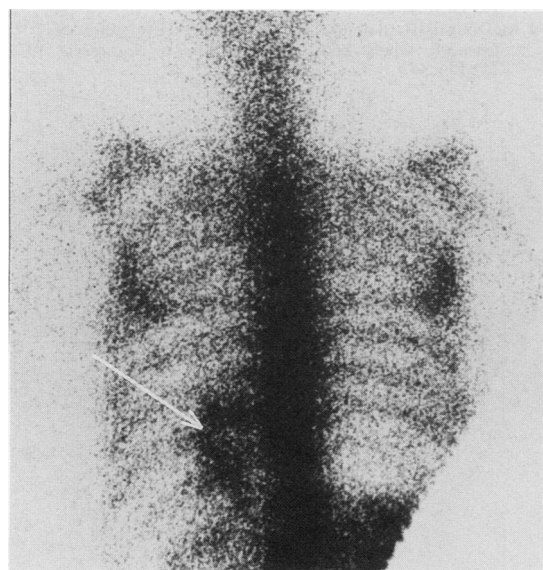


Fig 1 Posterior image: indium-111 labelled neutrophils showing abnormal uptake (arrowed) in the left paravertebral area of the lower thorax.

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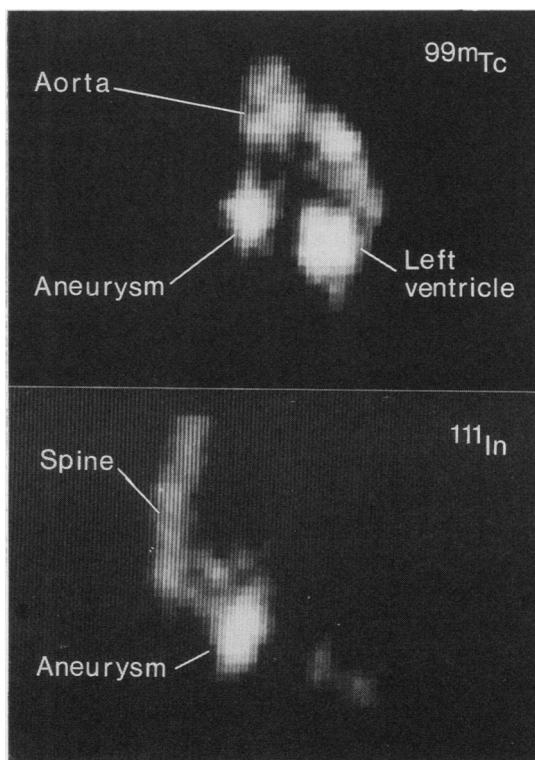


Fig 2 Simultaneously acquired computer reconstruction images in the same sagittal plane. Upper: Technetium-99m ($^{99\text{m}}\text{Tc}$) labelled human serum albumin showing blood pool in the left ventricle, aorta, and region of the aneurysm. Lower: Indium-111 (^{111}In) labelled neutrophils showing abnormal uptake at the site of the aneurysm, with normal uptake in the spine.

showed slight irregularity of the abdominal aorta, with a patent aorto-femoral and femoro-femoral graft. Treatment with flucloxacillin was started on admission and one week later the patient underwent excision of the sinus in the left iliac fossa. The histological appearances were those of a simple "stitch sinus." Despite these measures the pyrexia persisted and further investigations to identify the cause were instituted. Repeated blood, urine, and sputum cultures failed to grow any organism. Chest radiography and computed tomography of the abdomen showed no abnormalities (photographs supplied not published). Abdominal ultrasound examination showed no abnormality. Six weeks after admission to hospital a neutrophil scan showed uptake in the left paravertebral area of the lower thorax extending from T7 to T11 (fig 1). To improve anatomical localisation, dual isotope single photon emission computed tomography was performed with technetium-99m labelled human serum albumin to allow simultaneous imaging of the blood pool. This showed uptake of ^{111}In labelled neutrophils in the same position as the descending thoracic aorta, suggesting the diagnosis of a mycotic aneurysm (fig 2). An ascending aortogram then confirmed the presence of a saccular aneurysm in the descending thoracic aorta. The patient underwent emergency surgery and a 5 cm aneurysm, adherent to the left lower lobe, was resected and replaced with a low porosity Dacron graft. The aneurysm contained clot and liquified atheroma, from which *Staphylococcus aureus* was subsequently grown. Unfortunately, the patient died five weeks after operation.

Discussion

Autologous neutrophil scanning is not frequently required or performed for the detection of occult infection in the

thorax, but this case demonstrates the usefulness of whole body imaging even when an extra-abdominal source is not suspected.⁴ The use of a medium energy isotope, indium-111 polonate labelled leukocytes, allowed further interrogation of the area of abnormal uptake in the thorax when it was combined with the low energy isotope technetium as a blood pool marker. By using single photon emission computed tomography we could infer that the area of infection lay adjacent to or within the descending thoracic aorta, a finding confirmed at aortography and surgery. We believe that this is the first case report of detection of a mycotic aneurysm of the aorta by a ^{111}In labelled autologous neutrophil scan; while other techniques such as ultrasound or computed tomography, could have detected an aneurysm, they could not have confirmed that this was the source of infection.

References

- 1 Peters MA, Savarymuttu SH, Reavy HJ, Danpure HJ, Osman Lavender JP. Imaging of inflammation with indium-111 technetate labelled leukocytes. *J Nucl Med* 1983;24:39-44.
- 2 Coleman RE, Black RE, Welch DM, Maxwell JG. Indium-111 labelled leukocytes in the evaluation of suspected abdominal abscesses. *Am J Surg* 1980;139:99-104.
- 3 Segal AW, Arnot RW, Thakur ML, Lavender JP. Indium-111 labelled leucocytes for the localisation of abscesses. *Lancet* 1976;ii:1056-8.
- 4 McDougal IR, Baumert JE, Lantieri RL. Evaluation of ^{111}In leucocyte whole body scanning. *Am J Roentgenol* 1978;133:849-54.