

## Evaluation of arterial obstructive leg and foot disease by three-phase bone scintigraphy

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**Background:** The level selected for amputation should generally be the lowest compatible with tissue viability, with a reasonable expectation of wound healing in patients with arterial obstructive leg and foot disease, but determining the amputation level of an ischemic lower limb remains controversial. The general consensus is that a decisive and final decision about the amputation level should be made intraoperatively based on the extent of hemorrhage from the incised skin and soft tissue, and the degree of viability of the stump.

**Objective:** To estimate the extent of such hemorrhage, and thus suggest the level of amputation preoperatively, the author applied three-phase bone scintigraphy (TPBS) to assess the blood flow in the small arteries and capillary vessels.

**Method:** TPBS was performed in patients scheduled to undergo lower limb amputation in an attempt to determine the appropriate amputation level preoperatively, objectively, and visually. Imaging results of this examination were compared with the clinical findings in three cases of arterial obstructive foot disease.

**Results:** The “capillary phase” depicted the perfusion of blood from the small arteries to the capillary vessels. Decreased accumulation in the capillary phase appeared as two distinctive states: one of clinically remarkable necrosis and the other of decreased blood flow in the small arteries and capillary vessels. The latter inevitably causes necrosis and infection postoperatively.

**Conclusion:** The results of this study suggest that TPBS is an extremely useful tool in the evaluation of physiological dysfunction and the likely amputation level in patients with arterial obstructive leg and foot disease.

**Key words:** three-phase bone scintigraphy (TPBS), arterial obstructive foot disease, amputation