# Ventilation-perfusion scan (V/Q scan)

For diagnosis of suspected pulmonary embolism.

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CXR is also needed. A perfusion defect with no ventilation defect in a patient with no previous history of PE strongly suggests acute PE. Equivocal studies occur when an area of malperfusion corresponds to an area of reduced ventilation (on ventilation scan) or infiltrate (on CXR).

Probabilities of PE based on VQ scan:

Scan results - Incidence of PE

high probability 90–95%

intermediate probability or indeterminate 30–40%

low probability 10–15%

normal 0–5%

A technically adequate normal VQ scan virtually rules out PE. Patients with low or intermediate probability scans should have a test for Deep-vein thrombosis or quantitative D-dimer. If test for Deep-vein thrombosis is positive, treat; if it is negative, the choice is to follow serial IPG or Doppler studies for 2 weeks, or (rarely) to do a pulmonary angiogram.

Primary brain tumors are associated with an increased risk of pulmonary embolism (PE), particularly in the early post-operative period. The pathophysiological mechanisms of PE are poorly understood. A study aimed to describe prospectively extracellular vesicles (EVs) levels and investigate whether or not their variations allow to identify patients at increased risk of post-operative PE. Consecutive meningioma or glioma patients candidate to tumor resection were included in the study if a pulmonary perfusion scan (V/Q scan) performed before surgery ruled out PE. EVs derived from platelets (CD41+) or endothelial cells (CD144+), tissue factor-bearing EVs (CD142+) and their procoagulant subtype (Annexin A5) were analyzed by flow cytometry before surgery (T0), within 24 h (T1), two (T2) and seven days (T7) after surgery. Q-scan was repeated at T2. Ninety-three patients with meningioma, 59 with glioma and 76 healthy controls were included in the study. CD142+ and annexin V+/CD142+ EVs were increased at T0 in meningioma and glioma patients compared to healthy controls. Twenty-nine meningioma (32%) and 16 glioma patients (27%) developed PE at T2. EVs levels were similar in meningioma patients with or without PE, whereas annexin V+ and annexin V+/CD142+ EVs were significantly higher at T1 and T2 in glioma patients with PE than in those without. Procoagulant EVs, particularly annexin V+/CD142+, increase after surgery and are more prevalent in glioma patients who developed PE after surgery than in those who did not [1)].

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Passamonti SM, Artoni A, Carrabba G, Merati G, Abbattista M, Capecchi M, Castellani M, Marenghi C, Trombetta E, Giammattei L, Caroli M, Bucciarelli P, Scalambrino E, Peyvandi F, Martinelli I. Plasma levels of extracellular vesicles and the risk of post-operative pulmonary embolism in patients with primary brain tumors: a prospective study. J Thromb Thrombolysis. 2021 Apr 10. doi: 10.1007/s11239-021-02441-3. Epub ahead of print. PMID: 33837918.