

# Fat embolism syndrome

A fat **embolism** (FE) is a piece of intravascular fat that lodges within a **blood vessel** and causes a blockage of **blood flow**.

Most often seen after a long **bone fracture** (usually femoral, but may include clavicular, tibial, and even isolated **skull fracture**). Although almost all patients have pulmonary fat emboli at **autopsy**, the syndrome is usually mild or subclinical, only  $\approx 10\text{--}20\%$  of cases are severe, and the fulminant form leading to multiple organ failure is rare.

Clinical findings usually appear within 12–72 hrs of injury, and do not always include the complete classic clinical triad of:

- acute respiratory failure (including hypoxemia, tachypnea, dyspnea) with diffuse pulmonary infiltrates (usually seen as bilateral fluffy infiltrates). May be the only manifestation of fat emboli in up to 75% of cases
- global neurologic dysfunction: may include confusion (PaO<sub>2</sub> usually not low enough to account for these changes <sup>1)</sup>), lethargy, seizures
- petechial rash: seen  $\approx 24\text{--}72$  hrs after the fracture, usually over thorax

Other possible findings include:

- pyrexia
- retinal fat emboli

There is no specific test for fat embolism syndrome (FES). The following have been proposed, but have poor sensitivity and specificity: fat globules in the urine (positive in  $\approx$  one-third <sup>2)</sup>) and serum, serum lipase activity. In cases of unexplained neurologic or pulmonary abnormalities, it may be possible to diagnose FES if on bronchoalveolar lavage <sup>3)</sup>

- $> 5\%$  of cells in the washings staining for neutral fat with red oil O. Nonspecific tests include ABG (findings: hypoxemia, hypocarbia from hyperventilation, respiratory alkalosis).

## References

<sup>1)</sup>

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<sup>2)</sup>

Dines DE, Burgher LW, Okazaki H. The Clinical and Pathologic Correlation of Fat Embolism Syndrome. Mayo Clin Proc. 1975; 50:407–411

<sup>3)</sup>

Chastre J, Fagon JY, Soler P, Fichelle A, et al. Bronchoalveolar Lavage for Rapid Diagnosis of the Fat Embolism Syndrome in Trauma Patients. Ann Intern Med. 1990; 113:583–588

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