

羊水栓塞

羊水栓塞（AFE）

- 罕见的和毁灭性的
 - 1 in 20,000-30,000
 - 死亡率 25-80%
- 占产妇死亡数的12%
- 2/3的死亡发生于5小时内
- 15-25%的幸存者可保持神经无损
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- Clark SL, Hankins GD, Dudley DA, Dildy GA, Porter TF. Amniotic fluid embolism: analysis of the national registry. Am J Obstet Gynecol 1995;172:1158–67

(AFE) 临床表现

- 不限于分娩的某一时刻
- 可发生在所有3个产程和产后(分娩后 8 ± 8 分钟)
- 可见于：
 - 经阴道顺产或剖宫产
 - 择期终止妊娠
 - 羊膜穿刺术
 - 羊膜腔灌注术
 - 闭合性腹部创伤或手术

- Clark SL, Hankins GD, Dudley DA, Dildy GA, Porter TF. Amniotic fluid embolism: analysis of the national registry. Am J Obstet Gynecol 1995;172:1158–67

(AFE) 临床表现

体征或征象	发生率
• 高血压	100%
• 胎儿窘迫	100%
• 肺水肿或ARDS	93%
• 心跳呼吸骤停	87%
• 发绀	83%
• 凝血障碍	83%
• 呼吸困难	49%
• 癫痫发作	48%
• 宫缩无力	23%
• 支气管痉挛	15%
• 一过性高血压	11%
• 咳嗽	7%
• 头痛	7%
• 胸痛	2%

- ARDS=成人呼吸窘迫综合症
- Clark SL, Hankins GD, Dudley DA, Dildy GA, Porter TF. Amniotic fluid embolism: analysis of the national registry. Am J Obstet Gynecol 1995;172:1158–67

(AFE) 病理生理学

- 栓塞机制：
- 肺部微粒物质的出现与症状的严重程度少有关联
-
- Steiner PE, Lushbaugh C. Maternal pulmonary embolism by amniotic fluid as a cause of obstetric shock and unexplained death in obstetrics. JAMA 1941;117:1245–54

(AFE) 病理生理学

- 栓塞机制：
 -
 - 花生四烯酸代谢物(白细胞三烯)
- Clark SC. Arachidonic acid metabolites and the pathophysiology of amniotic fluid embolism. *Semin Reprod Endocrinol* 1985;3:253-7

(AFE) 病理生理学

- 栓塞机制：
- 免疫介导现象与大量的补体激活
- “妊娠过敏反应综合征”
- Benson D. A hypothesis regarding complement activation and amniotic fluid embolism. Med Hypotheses 2007;68:1019–25

(AFE) 病理生理学

- 两相的血流动力学反应
- 早期阶段:
 - 肺血管痉挛致右侧心力衰竭
 - 不到**30**分钟
- 第二阶段:
 - 左心室衰竭
 - 肺水肿

Clark SL. New concepts of amniotic fluid embolism: a review.

- Obstet Gynecol Surv 1990;45:360–8

(AFE) 病理生理学

- 凝血障碍的病因：
- 羊水纤溶酶原激活物抑制剂1
- Estelles A, Gilabert J, Andres C, Espana F, Aznar J. Plasminogen activator inhibitor type 1 and type 2 in amniotic fluid during pregnancy. *Thromb Haemost* 1990;64:281–5

(AFE) 病理生理学

- 凝血障碍的病因：
- 循环滋养层
 - Clark SL. New concepts of amniotic fluid embolism: a review.
 - Obstet Gynecol Surv 1990;45:360–8

(AFE) 病理生理学

- 凝血障碍的病因：
- 宫缩不良导致的单纯性大量出血
- Lockwood CJ, Bach R, Guha A, Zhou XD, Miller WA, Nemerson Y. Amniotic fluid contains tissue factor, a potent initiator of coagulation. Am J Obstet Gynecol 1991;165:1335–41

(AFE)诊断

- 表2，羊水栓塞的鉴别诊断

- 产科因素
 - 急性出血
 - 胎盘破裂
 - 子宫破裂
 - 子宫收缩不良
- 麻醉原因
 - 高位硬膜外麻醉
 - 吸入气体
 - 局麻药中毒
- 非产科原因
 - 肺栓塞
 - 空气栓塞
 - 过敏反应
 - 败血症/脓毒症休克

- Karetsky M, Ramirez M. Acute respiratory failure in pregnancy:
 - an analysis of 19 cases. Medicine (Baltimore) 1998;77:41-9

(AFE)诊断

- 诊断排除
- 血清类胰蛋白酶

- Fineschi V, Gambassi R, Gherardi M, Turillazzi . The diagnosis of amniotic fluid embolism: an immunohistochemical study for the quantification of pulmonary mast cell tryptase. Int J Legal Med 1998;111:238–43

(AFE)治疗

- 氧化
- 循环
- 凝血
- *DISPO*

(AFE)治疗

- 氧化
- 气管插管（及时）
- 100%O₂
- 正压通气

(AFE)治疗

- 循环
 - 大孔静脉穿刺
 - 动脉内置管
 - 肺动脉导管
 - 血管加压药/ 强心药支持
 - 晶体和胶体的容量支持
 - 迅速娩出胎儿
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- Clark SL, Hankins GD, Dudley DA, Dildy GA, Porter TF. Amniotic fluid embolism: analysis of the national registry. Am J Obstet Gynecol 1995;172:1158–67

(AFE)治疗

- 循环（续）
- 一氧化氮？
- McDonnell NJ, Chan BO, Frengley RW. Rapid reversal of critical haemodynamic compromise with nitric oxide in a patient with amniotic fluid embolism. *Int J Obstet Anesth* 2007;16:269–73

(AFE)治疗

- 循环（续）
- 心肺旁路/ECMO（体外膜肺氧合）
- Hsieh YY, Chang CC, Li PC, Tsai HD, Tsai CH. Successful application of extracorporeal membrane oxygenation and intraaortic counterpulsation as lifesaving therapy for a patient with amniotic fluid embolism. Am J Obstet Gynecol 2000;183:496–7

(AFE)治疗

- 循环（续）
- VAD（心室辅助装置）
 - Nagarsheth NP, Pinney S, Bassily-Marcus A, Anyanwu A, Friedman L, Beilin Y. Successful placement of a right ventricular assist device for treatment of a presumed amniotic fluid embolism. Anesth Analg 2008;107:962–4

(AFE)治疗

- 凝血
- rFVIIa（重组凝血因子）？抑肽酶？
- 氨基己酸/氨甲环酸？
- Gist RS, Stafford IP, Leibowitz AB, Beilin Y. Amniotic Fluid Embolism. Anesth Analg 2009;108:1599–602

