

DOĞUM KOMPLİKASYONLARI

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Postpartum Kanama

WHO tanımı; postpartum 24 saat içinde kan kaybı ≥ 500 ml olması durumunda postpartum kanama, ≥ 1000 ml olması durumunda şiddetli postpartum kanama varlığıdır (1). İnsidansı % 1-3 arasındadır (2).

Gebeliğin son dönemlerinde uterin arter kan akışı 500-700 ml/dk'dır ve bu akım kalp debisinin yaklaşık % 15'ini oluşturur, gebeliğin bu normal fizyolojik mekanizması nedeniyle doğum sırasında masif kanama ihtimali yüksektir. Gebede kan hacmi yaklaşık 1500-2000 ml artar, gebeler hematokritte belirgin azalma olmaksızın kan hacmindeki artış kadar kanamayı tolere edebilir (3). Kan kaybı; gebelik hipervolemisine hematokritte her %3'lük düşüş için 500 ml eklenerek hesaplanabilir.

Doğumdan sonra ilk 24 saat içinde olan kanamalar erken ya da primer, 24 saat ile 12 hafta arasında olanlar ise geç ya da sekonder olarak adlandırılır (4).

Uterin Atoni

Erken postpartum kanamanın en sık sebebidir. Atoni tanısı genellikle doğum eyleminin üçüncü evresinin rutin yönetiminde uterin masaj ve oksitosine rağmen uterus yeterince kontrakte olmaması ile konur.

Risk Faktörleri:

- ◆ Geçirilmiş uterin atoni hikayesi
- ◆ Primiparite (5) ve multiparite (6)
- ◆ Polihidramnios, çoğul gebelik, makrozomi gibi uterusun aşırı gerildiği durumlar
- ◆ Presipite ya da uzamış eylem
- ◆ Terbutalin, magnezyum, halotan gibi uterusu gevşetici ajanların kullanımı
- ◆ Doğumun oksitosin ya da prostaglandin ile induksiyonu (5)
- ◆ Koryoamniyonit

Tedavi:

Alt genital traktus yaralanması, plasenta retansiyonu ve uterin rüptür gibi tanılar ekarte edildikten sonra bimanuel masaj ve/veya kompresyon uygulanır, medikal uterotonik tedavi başlanır.

Medikal Tedaviye yanıt alınmadığı durumlarda;

- ◆ Anjiyografik Uterin Arter Embolizasyonu
- ◆ Uterin kompresyon sütürleri (B-Lynch Sütürleri); iskemik nekroz, adhezyon, uterin duvar hasarına neden olur.
- ◆ Uterin Tampon veya balon tamponad (Bakri Balon)
- ◆ Uteroovaryan Damar Ligasyonu

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engellediğinden uterin hipertonus amniyon sıvı embolisini en az arttıran durum olarak karşımıza çıkar. (101)

Öncelikle pulmoner ve sistemik hipertansiyon oluşan başlangıç fazı görülür. Pulmoner vazokonstriksiyonun (pulmoner vasküler direçte artış, pulmoner hipertansiyon, sağ kalpten sol kalbe geçiş) ardından sistemik vasküler rezistansta ve kardiyak outputta azalma oluşur (102). Ardından DIC, ARDS, beyin hasarı oluşur (100).

Tanı:

Postmortem konur (otopsi). Maternal sirkülasyonda fetal hücrelerin varlığı görülür. (103)

Amniyon sıvı embolisi tanı kriterleri; (100)

1. Hem hipotansiyon hem solunum yetmezliğinin olduğu ani gelişen kardiyopulmoner arrest
2. DIC dökümantasyonu; dilusyonel ya da şokla ilgili tüketim koagülopatisine neden olmak için yeterli kan kaybından önce koagülopati saptanmalıdır.
3. Klinik başlangıç doğum sırasında ya da plasantal doğumdan sonraki 30 dakika içinde
4. $\geq 38^{\circ}\text{C}$ ateş olmaması

Yaklaşım:

Acil resüsitasyon uygulanmalıdır. Trakeal entübasyon, kardiyopulmoner resüsitasyona acil olarak başlanmalıdır. Ancak herhangi bir girişim tipinin maternal veya fetal prognozu iyileştirdiğini gösteren bir kanıt yoktur. (100)

Prognoz:

Maternal mortalite yüksektir (% 60-90) (104,105). Yaşasa dahi kalıcı beyin hasarı sıktır (102). Sadece % 8'i nörolojik olarak sağlamdır. Nörolojik hasarın nedeni başlangıç aşamasında görülen oksijen saturasyonundaki derin düşüştür. Fetal neonatal sağ kalım % 70 olarak bildirilmiştir (99). Yaşayan fetusların % 50'sinde nörolojik sekel izlenir.

KAYNAKLAR

1. World Health Organization. WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: World Health Organization; 2012.
2. Sheldon WR, Blum J, Vogel JP, Souza JP, Gülmezoglu AM, Winikoff B; WHO Multicountry Survey on Maternal and Newborn Health Research Network. Postpartum haemorrhage management, risks, and maternal outcomes: findings from the World Health Organization Multicountry Survey on Maternal and Newborn Health. *BJOG*. 2014 Mar;121 Suppl 1:5-13. doi: 10.1111/1471-0528.12636. PMID: 24641530.
3. PRITCHARD JA. CHANGES IN THE BLOOD VOLUME DURING PREGNANCY AND DELIVERY. *Anesthesiology*. 1965 Jul-Aug;26:393-9. doi: 10.1097/0000542-196507000-00004. PMID: 14313451.
4. American College of Obstetricians and Gynecologists; Postpartum hemorrhage. Practice Bulletin No. 76, October 2006, Reaffirmed 2013b.
5. Driessen M, Bouvier-Colle MH, Dupont C, Khoshnood B, Rudigoz RC, Deneux-Tharaux C; Pithagore6 Group. Postpartum hemorrhage resulting from uterine atony after vaginal delivery: factors associated with severity. *Obstet Gynecol*. 2011 Jan;117(1):21-31. doi: 10.1097/AOG.0b013e318202c845. PMID: 21173641; PMCID: PMC3319503.
6. Babinszki A, Kerenyi T, Torok O, et al: Perinatal outcome in grand and great-grand multiparity: effects of parity on obstetric risk factors. *Am J Obstet Gynecol* 181:669.
7. Oleen MA, Mariano JP: Controlling refractory atonic postpartum hemorrhage with Hemabate sterile solution. *Am J Obstet Gynecol* 162:205, 1990.
8. Kenton K, Mueller M: Episiotomy and obstetric anal sphincter lacerations. In Yeomans ER, Hoffman BL, Gilstrap LC III, et al (eds): *Cunningham and Gilstrap's Operative Obstetrics*, 3rd ed. New York, McGraw-Hill Education, 2017.
9. Hirayama F, Koyanagi A, Mori R, et al: Prevalence and risk factors for third- and fourth-degree perineal lacerations during vaginal delivery: a multi-country study. *BJOG* 119(3):340, 2012.
10. Landy HJ, Laughon SK, Bailit JL, et al: Characteristics associated with severe perineal and cervical lacerations during vaginal delivery. *Obstet Gynecol* 117(3):627, 2011.
11. Gurol-Urganci I, Cromwell DA, Edozien LC, et al: Third- and fourth-degree perineal tears among primiparous women in England between 2000 and 2012: time trends and risk factors. *BJOG* 120(12):1516, 2013.
12. Melamed N, Gavish O, Eisner M, et al: Third- and fourth-degree perineal tears—incidence and risk factors. *J Matern Fetal Neonatal Med* 26(7):660, 2013
13. Hirsch E, Haney EI, Gordon TE, et al: Reducing high-order perineal laceration during operative vaginal delivery. *Am J Obstet Gynecol* 198(6):668.e1, 2008.
14. Kudish B, Blackwell S, Mcneeley SG, et al: Operative vaginal delivery and midline episiotomy: a bad



- combination for the perineum. *Am J Obstet Gynecol* 195(3):749, 200.
15. O'Mahony F, Hofmeyr GJ, Menon V: Choice of instruments for assisted vaginal delivery. *Cochrane Database Syst Rev* 11:CD005455, 2010.
 16. American College of Obstetricians and Gynecologists: Prophylactic antibiotics in labor and delivery. *Practice Bulletin No. 120*, June 2011, Reaffirmed 2016c.
 17. Blondel B, Alexander S, Bjarnadóttir RI, et al: Variations in rates of severe perineal tears and episiotomies in 20 European countries: a study based on routine national data in Euro-Peristat Project. *Acta Obstet Gynecol Scand* 95(7):746, 2016.
 18. Friedman AM, Ananth CV, Prendergast E, et al: Evaluation of third-degree and fourth-degree laceration rates as quality indicators. *Obstet Gynecol* 125(4):927, 2015.
 19. F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey and Catherine Y. Spong. "Williams Obstetrics, 25th Edition, pg 3464.
 20. Zelop CM, Shipp TD, Repke JT, et al: Outcomes of trial of labor following previous cesarean delivery among women with fetuses weighing >4000 g. *Am J Obstet Gynecol* 185:903, 2001.
 21. Shipp TD, Zelop CM, Repke JT, et al: Interdelivery interval and risk of symptomatic uterine rupture. *Obstet Gynecol* 97:175, 2001
 22. Yao R, Goetziner KR, Crimmins SD, et al: Association of maternal obesity with maternal and neonatal outcomes in cases of uterine rupture. *Obstet Gynecol* 129:683, 2017.
 23. Happe SK, Yule CS, Wells EC: Outcomes in pregnancies complicated by uterine rupture. Unpublished data, 2017
 24. Kieser KE, Baskett TF: A 10-year population-based study of uterine rupture. *Obstet Gynecol* 100:749, 2002.
 25. F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey and Catherine Y. Spong. "Williams Obstetrics, 25th Edition, pg 4502.
 26. Gibbins KJ, Weber T, Holmgren CM, et al: Maternal and fetal morbidity associated with uterine rupture of the unscarred uterus. *Am J Obstet Gynecol* 213(3):382. e1, 2015.
 27. Porreco RP, Clark SL, Belfort MA, et al: The changing specter of uterine rupture. *Am J Obstet Gynecol* 200(3):269.e1, 2009.
 28. Coad S, Dahlgren L, Hutcheson JA: Risk and consequences of puerperal uterine inversion in the United States, 2004–2013. *Am J Obstet Gynecol* 217:377, 2017.
 29. Ogah K, Munjuluri N: Complete uterine inversion after vaginal delivery. *J Obstet Gynaecol* 31(3):265, 2011.
 30. Pan J, Zhou L, Huang A, et al: Sonographic diagnosis of complete uterine inversion: an unusual case. *Clin Exp Obstet Gynecol* 42(2):240, 2015.
 31. F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey and Catherine Y. Spong. "Williams Obstetrics, 25th Edition, pg 4474.
 32. You WB, Zahn CM: Postpartum hemorrhage: abnormally adherent placenta, uterine inversion, and puerperal hematomas. *Clin Obstet Gynecol* 49:184, 2006.
 33. Sangwan N, Nanda S, Singhal S, et al: Puerperal uterine inversion associated with unicornuate uterus. *Arch Gynecol Obstet* 280(4):625, 2009.
 34. Haeri S, Rais S, Monks B: Intrauterine tamponade balloon use in the treatment of uterine inversion. *BMJ Case Rep* January 6, 2015.
 35. Mondal PC, Ghosh D, Santra D, et al: Role of Hayman technique and its modification in recurrent puerperal uterine inversion. *J Obstet Gynaecol Res* 38(2):438, 2012.
 36. Duzyj CM, Barishansky S, Khan S, et al: Evidence of active wound remodeling at the site of trophoblast invasion in placenta accreta. Abstract No. 147, *Am J Obstet Gynecol* 216:S99, 2017.
 37. Goh WA, Zalud I: Placenta accreta: diagnosis, management and the molecular biology of the morbidly adherent placenta. *J Matern Fetal Neonatal Med* 29(11):1795, 2016.
 38. Happe SK, Rac MW, Moschos E, et al: Prospective assessment of morbidly adherent placenta with first trimester ultrasound. Presented at the 38th Annual Meeting of the Society for Maternal-Fetal Medicine, January 29–February 3, 2018.
 39. Berhie SH, Molina RL, Davis MR, et al: Laparoscopic hysterectomy for 7-week cesarean delivery scar implantation pregnancy. *Am J Obstet Gynecol* 212:247.e1, 2015.
 40. Bailit JL, Grobman WA, Rice MM, et al: Morbidly adherent placenta treatments and outcomes. *Obstet Gynecol* 125(3):683, 2015.
 41. Silver RM: Abnormal placentation: placenta previa, vasa previa, and placenta accreta. *Obstet Gynecol* 126(3):654, 2015a.
 42. Wong HS, Cheung YK, Zuccollo J, et al: Evaluation of sonographic diagnostic criteria for placenta accreta. *J Clin Ultrasound* 36(9):551, 2008.
 43. Frederiksen MC, Glassenberg R, Stika CS. Placenta previa: a 22-year analysis. *Am J Obstet Gynecol*. 1999 Jun;180(6 Pt 1):1432-7.
 44. Koonings PP, Paul RH, Campbell K. Umbilical cord prolapse. A contemporary look. *J Reprod Med*. 1990 Jul;35(7):690-2.
 45. Ylä-Outinen A, Heinonen PK, Tuimala R. Predisposing and risk factors of umbilical cord prolapse. *Acta Obstet Gynecol Scand*. 1985;64(7):567-70.
 46. Mogos MF, Salemi JL, Ashley M, et al: Recent trends in placenta accreta in the United States and its impact on maternal-fetal morbidity and healthcare-associated costs, 1998–2011. *Ultrasound Obstet Gynecol* 29(7): 1077, 2016.
 47. Hung TH, Shau WY, Hsieh CC, et al: Risk factors for placenta accreta. *Obstet Gynecol* 93:545, 1999.
 48. Happe SK, Rac MW, Moschos E, et al: Prospective assessment of morbidly adherent placenta with first trimester ultrasound. Presented at the 38th Annual Meeting of the Society for Maternal-Fetal Medicine,



- January 29–February 3, 2018.
49. Warshak CR, Eskander R, Hull AD, et al: Accuracy of ultrasonography and magnetic resonance imaging in the diagnosis of placenta accreta. *Obstet Gynecol* 108(3 Pt 1):573, 2006.
 50. American College of Obstetricians and Gynecologists: Placenta accreta. Committee Opinion No. 529, July 2012, Reaffirmed 2017c.
 51. Collins SL, Stevenson GN, Al-Khan A, et al: Three-dimensional power Doppler ultrasonography for diagnosing abnormally invasive placenta and quantifying the risk. *Obstet Gynecol* 126(3):645, 2015.
 52. Rac MW, Dashe JS, Wells CE, et al: Ultrasound predictors of placental invasion: the Placenta Accreta Index. *Am J Obstet Gynecol* 212:343, 2015a.
 53. Cali G, Biambanco L, Puccio G, et al: Morbidly adherent placenta: evaluation of ultrasound diagnostic criteria and differentiation of placenta accreta from percreta. *Ultrasound Obstet Gynecol* 41(4):406, 2013.
 54. American College of Obstetricians and Gynecologists: Placenta accreta. Committee Opinion No. 529, July 2012, Reaffirmed 2017c.
 55. Society for Maternal-Fetal Medicine, Belfort MA: Placenta accreta. *Am J Obstet Gynecol* 203(5):430, 2011.
 56. Fox K, Shamshirsaz A, Salmanian B, et al: Is interpregnancy interval a predictor of severity of invasion in morbidly adherent placenta? Abstract No. 821, *Am J Obstet Gynecol* 212(1):S395, 2015.
 57. Bretelle f, Courbière B, Mazouni C, et al: Management of placenta accreta: morbidity and outcome. *Eur J Obstet Gynecol Reprod Biol* 133(1):34, 2007.
 58. Lipe BC, Dumas MA, Ornstein DL: Von Willebrand disease in pregnancy. *Hematol Oncol Clin North Am* 25(2):335, 2011.
 59. Al Tawil K, Saleem N, Kadri H, et al: Traumatic facial nerve palsy in newborns: is it always iatrogenic? *Am J Perinatol* 27:711, 2010.
 60. Levine MG, Holroyde J, Woods JR, et al: Birth trauma: incidence and predisposing factors. *Obstet Gynecol* 63:792, 1984.
 61. Baskett TF, Allen VM, O'Connell CM, et al: Fetal trauma in term pregnancy. *Am J Obstet Gynecol* 197:499.e1, 2007.
 62. Volpe JJ: *Neurology of the Newborn*, 3rd ed. Philadelphia, Saunders, 1995.
 63. Torke M, Barton L, Miller D, et al: Severe brachial plexus palsy in women without shoulder dystocia. *Obstet Gynecol* 120(3):539, 2012.
 64. Wall LB, Mills JK, Leveno KJ, et al: Incidence and prognosis of neonatal brachial plexus palsy with and without clavicle fractures. *Obstet Gynecol* 123(6):1288, 2014.
 65. Ouzounian JG: Shoulder dystocia: incidence and risk factors. *Clin Obstet Gynecol* 59(4):791, 2016.
 66. Spong CY, Beall M, Rodrigues D, et al: An objective definition of shoulder dystocia: prolonged head-to-body delivery intervals and/or the use of ancillary obstetric maneuvers. *Obstet Gynecol* 86:433, 1995.
 67. Leung TY, Stuart O, Sahota DS: Head-to-body delivery interval and risk of fetal acidosis and hypoxic ischemic encephalopathy in shoulder dystocia: a retrospective review. *BJOG* 118(4):474, 2011a.
 68. Mehta SH, Bujold E, Blackwell SC, et al: Is abnormal labor associated with shoulder dystocia in nulliparous women? *Am J Obstet Gynecol* 190(6):1604, 2004.
 69. Overland EA, Spydslaug A, Nielsen CS, et al: Risk of shoulder dystocia in second delivery: does a history of shoulder dystocia matter? *Am J Obstet Gynecol* 200(5):506.e1, 2009.
 70. Schummers L, Hutcheon JA, Bodnar LM, et al: Risk of adverse pregnancy outcomes by prepregnancy body mass index: a population-based study to inform prepregnancy weight loss counseling. *Obstet Gynecol* 125(1):133, 2015.
 71. MacKenzie IZ, Shah M, Lean K, et al: Management of shoulder dystocia: trends in incidence and maternal and neonatal morbidity. *Obstet Gynecol* 110:1059, 2007.
 72. Øverland EA, Vatten LJ, Eskild A: Pregnancy week at delivery and the risk of shoulder dystocia: a population study of 2,014,956 deliveries. *BJOG* 121(1):34, 2014.
 73. Jolly MC, Sebire NJ, Harris JP, et al: Risk factors for macrosomia and its clinical consequences: a study of 350,311 pregnancies. *Eur J Obstet Gynecol Reprod Biol* 111(1):9, 2003.
 74. Koyanagi A, Zhang J, Dagvadorj A, et al: Macrosomia in 23 developing countries: an analysis of a multi-country, facility-based, cross-sectional survey. *Lancet* 381(9865):476, 2013.
 75. Bingham J, Chauhan SP, Hayes E, et al: Recurrent shoulder dystocia: a review. *Obstet Gynecol Surv* 65(3):183, 2010.
 76. Ouzounian JG, Korst LM, Miller DA, et al: Brachial plexus palsy and shoulder dystocia: obstetric risk factors remain elusive. *Am J Perinatol* 30(4):303, 2013.
 77. American College of Obstetricians and Gynecologists: Shoulder dystocia. Practice Bulletin No. 178, November 2002, Reaffirmed May 2017c.
 78. Gonik B, Allen R, Sorab J: Objective evaluation of the shoulder dystocia phenomenon: effect of maternal pelvic orientation on force reduction. *Obstet Gynecol* 74:44, 1989.
 79. Woods CE: A principle of physics is applicable to shoulder delivery. *Am J Obstet Gynecol* 45:796, 1943.
 80. Cluver CA, Hofmeyr GJ: Posterior axilla sling traction: a technique for intractable shoulder dystocia. *Obstet Gynecol* 113(2 Pt 2):486, 2009.
 81. Rubin A: Management of shoulder dystocia. *JAMA* 189:835, 1964.
 82. Bruner JP, Drummond SB, Meenan AL, et al: All-fours maneuver for reducing shoulder dystocia during labor. *J Reprod Med* 43(5):439, 1998.
 83. Sandberg EC: The Zavanelli maneuver: a potentially revolutionary method for the resolution of shoulder dystocia. *Am J Obstet Gynecol* 152:479, 1985.
 84. Goodwin TM, Banks E, Millar LK, et al: Catastrophic shoulder dystocia and emergency symphysiotomy. *Am J Obstet Gynecol* 177:463, 1997.
 85. Schramm M: Impacted shoulders—a personal experience. *Aust N Z J Obstet Gynaecol* 23:28, 1983.



86. Nelson KB, Blair E: Prenatal factors in singletons with cerebral palsy born at or near term. *N Engl J Med* 373(10):946, 2015.
87. Stanley FJ, Blair E: Why have we failed to reduce the frequency of cerebral palsy? *Med J Aust* 154:623, 1991.
88. Phelan JP, Ahn MO, Korst L, et al: Is intrapartum fetal brain injury in the term fetus preventable? *Am J Obstet Gynecol* 174:318, 1996.
89. F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, Jodi S. Dashe, Barbara L. Hoffman, Brian M. Casey and Catherine Y. Spong. "Williams Obstetrics, 25th Edition, pg 4225.
90. Ahlin K, Himmelmann K, Hagberg G, et al: Cerebral palsy and perinatal infection in children born at term. *Obstet Gynecol* 122:41, 2013.
91. Blair E, de Groot JH, Nelson KD: Placental infarction identified by macroscopic examination and risk of cerebral palsy in infants at 35 weeks of gestational age and over. *Am J Obstet Gynecol* 205(2):124.e1, 2011.
92. Moster D, Lie RT, Markestad T: Long-term medical and social consequences of preterm birth. *N Engl J Med* 359:262, 2008.
93. Nelson KB, Ellenberg JH: Obstetric complications as risk factors for cerebral palsy or seizure disorders. *JAMA* 251:1843, 1984.
94. Nelson KB, Ellenberg JH: Antecedents of cerebral palsy: univariate analysis of risks. *Am J Dis Child* 139:1031, 1985.
95. Nelson KB, Ellenberg JH: Antecedents of cerebral palsy: multivariate analysis of risk. *N Engl J Med* 315:81, 1986a.
96. American College of Obstetricians and Gynecologists: Neonatal encephalopathy and neurologic outcome, second edition. Report of the American College of Obstetricians and Gynecologists' Task Force on Neonatal Encephalopathy. *Obstet Gynecol* 123(4):896, 2014b.
97. Moczygamba CK, Paramsothy P, Meikle S, et al: Route of delivery and neonatal birth trauma. *Am J Obstet Gynecol* 202(4):361.e1, 2010.
98. Werner EF, Janevic TM, Illuzzi J, et al: Mode of delivery in nulliparous women and neonatal intracranial injury. *Obstet Gynecol* 118(6):1239, 2011.
99. Volpe JJ: *Neurology of the Newborn*, 3rd ed. Philadelphia, Saunders, 1995.
100. Clark SL: Amniotic fluid embolism. *Obstet Gynecol* 123:337, 2014.
101. Knight M, Tuffnell D, Brocklehurst P, et al: Incidence and risk factors for amniotic-fluid embolism. *Obstet Gynecol* 115(5):910, 2010.
102. Kramer MS, Rouleau J, Liu S, et al: Amniotic fluid embolism: incidence, risk factors, and impact on perinatal outcomes. *BJOG* 119(7):874, 2012.
103. Society for Maternal-Fetal Medicine, Pacheco LK, Saade G, et al: Amniotic fluid embolism; diagnosis and management. *Am J Obstet Gynecol* 215(2):B16, 2016.
104. Clark SL, Phelan JP, Yeh SY: Hypogastric artery ligation for obstetric hemorrhage. *Obstet Gynecol* 66:353, 1985.
105. Clark SL, Hankins GDV, Dudley DA, et al: Amniotic fluid embolism: analysis of the National Registry. *Am J Obstet Gynecol* 172:1158, 1995.
106. Clark SL, Pavlova Z, Greenspoon J, et al: Squamous cells in the maternal pulmonary circulation. *Am J Obstet Gynecol* 154:104, 1986.
107. Gilbert WM, Danielsen B: Amniotic fluid embolism: decreased mortality in a population-based study. *Obstet Gynecol* 93:973, 1999.
108. Weiwen Y: Study of the diagnosis and management of amniotic fluid embolism: 38 cases of analysis. *Obstet Gynecol* 95:385, 2000.

