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Evaluating causation in the potential birth injury case

Brain injury can occur when obstetricians or nurses negligently fail to rescue a fetus by expedited vaginal delivery or caesarean section. The most serious of these brain injuries results in a condition known as cerebral palsy. When an attorney is consulted by the parents of a baby with cerebral palsy, the case evaluation requires a thorough understanding of how this affliction was caused. This article examines causation in birth injury cases and discusses some of the medical issues most commonly encountered in litigation.

What is cerebral palsy?

Cerebral palsy is a non-progressive, central nervous system disorder manifested by profound motor deficits and abnormal muscle tone. How the disorder manifests in any given child depends upon the location of the damage within the brain.

An attorney reviewing the medical records of a child with cerebral palsy will likely encounter descriptive medical terms aimed at defining the *type* of brain damage. Medical terms also indicate whether the abnormal muscle movement is present in two extremities (diplegia) or all four extremities (quadriplegia). *Spastic* cerebral palsy refers to stiff and difficult movement. *Athetoid* cerebral palsy is associated with involuntary and uncontrolled movement. *Ataxic* cerebral palsy refers to a disturbed sense of balance. Cerebral palsy is most often, but not always, associated with mental retardation. If the child can speak at all, he or she almost always has impairment due to poor control of the muscles involved in phonation. Many children have seizures. Most are confined to a wheelchair.

In many children, the cause of cerebral palsy is unknown. However, one of the few *known* causes of cerebral palsy is perinatal asphyxia. Cerebral palsy caused by failure to timely treat perinatal asphyxia gives rise to the medical negligence claim frequently referred to as a birth injury case.

What is perinatal asphyxia?

Perinatal asphyxia means hypoxemia and metabolic acidosis resulting in irreversible brain damage in the fetus. In the context of perinatal asphyxia, hypoxemia is an abnormally low level of oxygen in the fetal blood; metabolic acidosis is usually defined as an umbilical artery pH of less than 7.1 and a base deficit of greater than 10. With the advent of fetal monitoring, it became possible to detect hypoxemia and metabolic acidosis in the baby at a time when irreversible brain damage had not yet occurred. Because the brain controls the fetal heart rate through a system of unconscious reflexes that are sensitive to oxygen deprivation, certain characteristic changes in the tracing mean that the baby is in danger of asphyxiation. Failure to recognize and timely treat signs of asphyxiation detectable on the fetal heart monitor is probably the most frequently occurring claim of negligence in birth injury cases.

Events in labor and delivery

Because many causes of cerebral palsy are unknown, one can expect to be faced with causation arguments that attempt to place the occurrence of the injury at a time and place where the obstetrician had no opportunity to intervene to save the fetus from irreversible brain damage. Some of the most commonly encountered defenses include: absence of findings on the fetal heart tracing consistent with hypoxia; umbilical cord gases inconsistent with hypoxia and metabolic acidosis; a neonatal course inconsistent with an intrapartum injury; absence of neuroradiographic evidence of intrapartum brain injury; and placental pathology used to rule out intrapartum injury or to provide an alternative explanation for the cause of the injury.

Practice pointer

In evaluating a potential birth injury case, be certain to obtain all fetal monitor tracings and have them thoroughly

reviewed by an obstetrical expert. Be certain that the expert can clearly define the time frame in which the injury occurred. Labor and delivery records should be examined for all references to interpretation of the tracings. Compare the tracings with the entries. Subtle findings of fetal hypoxia, such as late decelerations, are often missed by those attending the mother.

Events in the delivery room

Apgar scores

The asphyxiated term infant will likely require resuscitation in the delivery room. Those attending the baby should make their decision whether or not to undertake resuscitation efforts on the basis of the Apgar scores measured at one, five and ten minutes of life. Dr. Virginia Apgar used the letters of her name as a mnemonic that stands for Activity (muscle tone), Pulse (heart rate), Grimace (reflex irritability), Appearance (skin color), and Respiration. Each of these five components is given a score between 0-2.

At each interval, a score of zero signifies absent heart rate, absent respirations, limp muscle tone, absent reflex irritability or blue color. A one is assigned for a heart rate less than 100 beats per minute, a weak cry, some flexion, grimace and pink body but blue hands and feet. Two is assigned when the heart rate is greater than 100 beats per minute, there is a good, strong cry, active motion, withdrawal and completely pink for each category measured. The numbers assigned to each component are totaled and a score is given. For example, an Apgar of three could be composed of zero for color, zero for reflexes, one for tone, one for respirations and one for heart rate.

In July 1996, the American College of Obstetricians and Gynecologists (ACOG), published its Committee Opinion Number 174, which argues that only those infants who score zero-to-three for longer

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than five minutes can be considered to have asphyxia severe enough to result in acute neurological injury. Although this premise may be debatable, case evaluation should include a close examination of the Apgar scores to determine whether the findings support a diagnosis of asphyxia according to those ACOG guidelines.

It is also important to determine whether the person assigning the scores was qualified and whether he or she accurately recorded the findings. Compare the events of the resuscitation to the Apgar score. They may not match. For instance, if a score of two is given for respirations at five minutes and the records indicate the baby had been previously intubated and was being bagged, the score cannot be correct. Also compare the scores to the written progress note of the physician attending the resuscitation. The scores may not match the clinical description of the baby.

Umbilical cord gases

Delivery records should be reviewed for umbilical cord blood gas results. If the fetal monitor tracing has shown evidence of fetal hypoxia in labor and low Apgar scores persist beyond five minutes of age, an arterial umbilical cord gas should be obtained by the delivery room staff.

Obstetrical units should have written policies and procedures dictating the circumstances under which cord gases must be obtained and how the procedure is to be conducted, such as in the face of persistently low Apgar scores or complication during labor. These policies and procedures may be procured through a routine demand for inspection of documents and things. Policies usually call for the cord to be doubly clamped at delivery. Blood contained within the clamped cord should be stable for blood gas analysis for up to sixty minutes. If the baby continues to have a low Apgar score beyond five minutes of life, a blood sample is obtained from the cord artery and sent for blood gas analysis.

Expert opinions about what result is consistent with asphyxia vary. Many physicians believe that cord gases showing a pH of less than 7.1 and a base deficit greater than 10 are consistent with

asphyxia sufficient to cause permanent neurological injury in the neonate. Defense experts usually argue that the normal fetal umbilical arterial pH is as low as 7.0 and maintain that a base deficit greater than 12 is required to support a conclusion that the baby was asphyxiated during labor. The distinction may be important to your case. Be certain to determine which guideline your retained expert and the treating neonatologist apply in determining whether cord gases are consistent with asphyxia.

Neonatal Course

Babies who have sustained a birth injury in the perinatal period sufficient to result in irreversible brain damage typically manifest certain medical problems immediately after birth. These neonatal problems generally include inability to feed requiring tube feedings or total intravenous nutrition. They are often poorly responsive or comatose and require the assistance of mechanical ventilation. They exhibit abnormal tone and reflexes and have a high incidence of seizure activity in the neonatal period. Because the neonate has sustained a “sublethal” injury to the brain caused by insufficient blood flow and oxygen delivery, the records commonly reflect evidence of damage to other organ systems as well. Damage to the cardiovascular system commonly results in the need for vasopressors to maintain blood pressure. Abnormalities in blood counts and kidney function are common. Not all neonates suffering from hypoxic-ischemic encephalopathy will manifest all these disorders; however, neonatal seizures and respiratory depression are most strongly correlated with birth asphyxia.

Neuroimaging

Magnetic resonance imaging (MRI) is useful in assessing the severity of brain damage in neonates who have suffered hypoxic-ischemic injuries. For this reason, the neonatal medical records often contain the reports of one or more MRI examinations of the head. All films should be obtained through discovery and given to a pediatric neuroradiologist for review. The expert should confirm

whether the films were correctly interpreted by the treating radiologist and whether the pattern of injury seen is or is not consistent with perinatal asphyxia. If an MRI was never performed, consider obtaining a current study because evidence of intrapartum injury should persist.

It is important for the attorney evaluating a case to be aware of a few principles about findings on the MRI that may support or defeat a claim of perinatal asphyxia. If evidence of perinatal injury is present on the MRI, the pattern seen will depend upon whether the baby was full term or premature at the time it sustained the insult and whether the interruption of blood flow to the baby was complete or partial.

Areas of the fetal brain that have the greatest requirements for oxygen and glucose (metabolic rate) will be injured first. The thalamus and basal ganglion usually have the highest metabolic rates in the full-term infant. The basal ganglia and thalamus control movement. Therefore, damage to these areas of the brain can result in cerebral palsy. With mild-to-moderate interruptions in blood flow, evidence of injury may appear in the white matter of the cerebral cortex and in white matter surrounding the ventricles of the brain. The condition may be referred to on the MRI report as “periventricular leukomalacia.” Question your expert about whether the MRI shows evidence of injury in these areas.

Placental pathology

Standards of care dictate that hospitals establish policies and procedures about when the placenta should be sent for pathological examination; these should typically include perinatal asphyxia. Placental pathology reports make reference to the weight of the placenta, cord length, color and age of the placenta and whether there is evidence of infection.

If the records contain a placental pathology report, consider whether to retain a highly qualified pathologist specializing in interpretation of the placenta. Most hospitals do not have on staff a pathologist who is skilled in placental examination. Consequently, the interpretation and con-

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clusions contained in the report may not be complete or even accurate.

If you determine that a placental pathologist may be of assistance in your case, obtain access to the original pathology slides. Examination of re-cuts may yield erroneous or different information and your expert needs to examine the same slides as the treating pathologist in order for the testimony to be credible.

Like MRI findings, placental pathology may be used as a causation sword or shield in the birth injury case. Defendants will argue that the findings place the time of the injury at a point in the perinatal period when the obstetrician could not have known about or prevented its occurrence. However, the findings may also be used to bolster a plaintiff's case. For instance, a stressed fetus may pass stool (meconium) in response to hypoxemia and acidosis. The meconium first stains the amniotic fluid, then the placental membranes and eventually the cord. The pathologist may be able to time the injury roughly based on the location and degree of meconium staining. On the one hand, if timing by the pathologist coincides with findings on the fetal heart tracing, this is

compelling evidence that the injury occurred as a result of perinatal asphyxia. On the other hand, if pathology results show evidence of untreated infection, an aged placenta or placental abruption, making a case that the cerebral palsy occurred as a result of perinatal asphyxia during labor or delivery would be more difficult.

Practice tips

Events that occur in labor and delivery and in the baby's hospitalization immediately following birth can be used to make a strong case for perinatal asphyxia or may contain traps for the unaware at the time of trial. In evaluating causation in the birth injury case, review the fetal monitor tracing for evidence of an adverse event in the perinatal period sufficient to result in an hypoxic-ischemic event in the baby.

Review the delivery records for Apgar scores and umbilical cord gases to determine whether these findings support and are consistent with the diagnosis. Obtain and review the baby's neonatal records for evidence of "sublethal" injury to the brain, lungs, heart, kidneys and for neo-natal seizures. Have your experts analyze the

MRIs and placental pathology results so that you can determine as early as possible whether those findings bolster or weaken the case.

Not all elements in the causation analysis are necessary to make a successful claim. However, a baby with cerebral palsy exhibiting normal Apgar scores, a cord pH greater than 7.1, who was never admitted to the neonatal intensive care unit, is unlikely to have experienced an adverse event in the perinatal period sufficient to account for its neurological deficits. Although the outcome may be just as tragic, proving causation will be problematic and the odds greatly favor a defense verdict. Conversely, cerebral palsy preceded by complications that could have been prevented present a case worth consideration.

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