

Short Reports

Prenatal Sonographic Diagnosis of Cephalohematoma Due to Pre-Labor Trauma

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Abstract. A case of neonatal cephalohematoma secondary to fetal trauma prior to the labor and delivery is presented. History of blunt maternal abdominal trauma by an automobile steering wheel is cited as the etiology. Fetal scalp mass diagnosed by sonogram is illustrated. Pathogenesis, diagnosis and management are discussed.

Key words: Cephalohematoma – Neonatal – Trauma – Sonogram

The presence of an occipital or parietal scalp mass is a common finding in the newborn. The most common causes of this are caput succedenum and cephalohematoma, which are usually related to the processes of labor and delivery [1]. A case is presented here which describes a fetal scalp mass diagnosed before the onset of labor and which was temporally related to blunt abdominal trauma to the mother.

Case Report

The patient was a 31 year-old gravida 1, para 0, woman whose gestation was at 32 weeks based on last menstrual period. She was admitted to Columbia Hospital for Women with premature rupture of membranes of 12 hours duration and no vaginal bleeding. The woman reported the incidence of hitting her abdomen on the steering wheel of her automobile approximately one week prior to admission. Physical examination of the mother indicated no signs of trauma. A soft mass was palpable in the occipital area of the fetal scalp. Sonar scanning showed a single fetus in cephalic presentation with a posterior placenta. A soft tissue structure was identified at the apex of the fetal skull (Fig. 1). No other anomalies were noted. Pitocin was started because of failure-to-progress. When membranes had been ruptured for twenty-four [24] hours, a primary Cesarean section delivery was performed. Apgar scores were 6 and 7 at one and five minutes respectively. Physical examination

showed a 1.65 kg. male, approximately 32 to 33 weeks gestational age. There was a soft tissue swelling in the occipital area of the scalp. The mass was $4 \times 5 \times 3$ cm. in measurement, soft and boggy with erythema of the overlying skin. It was non-pulsatile without auscultable murmur, and transillumination was negative. The fontanelles and sutures were normal. Head circumference was 29 cm. which was within normal limits for age. Neurological examination was normal. Initial laboratory evaluation revealed hemoglobin and coagulation studies to be within normal limits. Skull x-ray showed an occipitoparietal scalp mass without fracture (Fig. 2). Based on neurosurgical, neonatological and radiological opinion, the mass was judged to be a cephalohematoma typical of a traumatic lesion. The mass decreased in size after birth and resolved completely within three weeks. Head growth was normal and neurological examination remained unremarkable. Bilirubin level rose to a peak of 10 mg/dl

Discussion

This case illustrates the fact that an occipital scalp mass in the fetus and newborn is not always due to the forces of labor and delivery. In this situation, history, physical examination and sonar scanning diagnosed the mass and related it to blunt abdominal trauma prior to onset of labor. Injury to the fetus caused by blunt abdominal trauma is unusual. The incidence has been estimated at less than one per 10,000 births [4]. After the first trimester of pregnancy, the uterus extends out of the pelvis, and becomes more accessible to direct trauma. However, the pregnant uterus is fluid-filled and protected by abdominal wall, bowel and bladder in the anterior direction. The fetus is protected by the cushioning effect of the amniotic fluid and the elasticity of the uterus. In addition, the effects of inertial forces are offset by the amniotic fluid. In most reported instances, fetal skull injury was due to maternal pelvic fracture in which the dislocation of the pelvic bones during the fracture process crushes the entrapped fetal skull [3]. There was no evidence of ma-

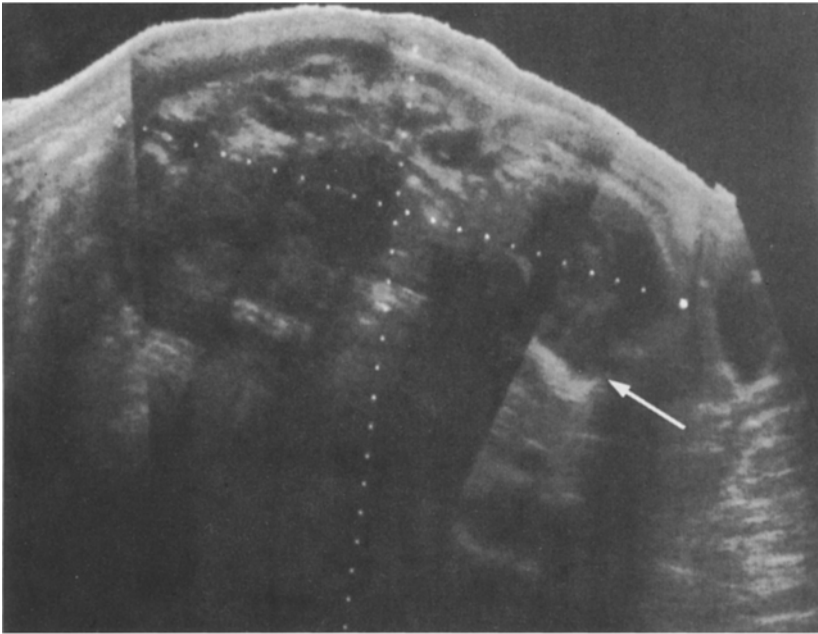


Fig. 1. Abdominal sonogram of intrauterine pregnancy at 32 weeks' gestation taken before the onset of labor. Soft tissue enlargement is present at the apex of the fetal skull

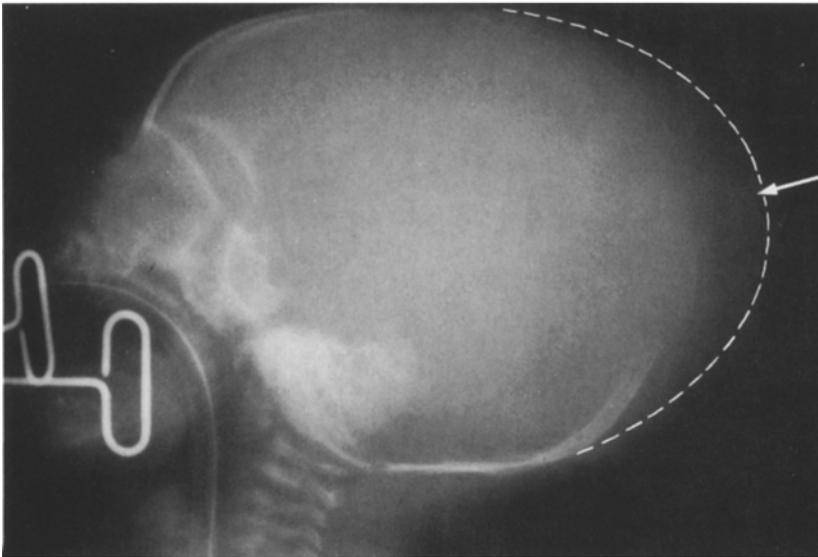


Fig. 2. Skull x-ray, lateral view at 6 hours of age. Occipital scalp mass is present

ternal injury in this case. The relationship of premature rupture of membranes and premature labor to the traumatic incident or to increasing fetal scalp mass is speculative.

Ascertaining the etiology and the timing of scalp masses in newborns is important for therapeutic reasons, as well as potential legal implications for the physician. Cephalohematomata acquired during labor and delivery often demonstrate an increase in size up to three days postnatally [5]. Caput succadenum usually decreases in size after birth and resolves with-

in a few days. The mass in this patient steadily decreased after birth, but took three weeks to resolve. Traumatic bleedings into the neonatal scalp may occur at the subcutaneous, subaponeurotic and the subperiosteal levels. The latter may be distinguished on physical examination through identification of sharp confinement by the edges of the bone which they overlie and shells of bone forming over them by the lifted periosteum which covers them externally [2]. If the fetal skull injury is thought to be secondary to a pre-labor incident, then examination of mother's ab-

domen and pelvis for signs of trauma should be done. Routine evaluation of the newborn includes skull x-ray, periodic hemoglobin, bilirubin (and coagulation studies if excess bleeding is suspected), and neurologic examination. Needle aspiration of the mass is contraindicated because of the risk of infection.

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References

1. Bell WE (1977) Perinatal trauma to the head. In: Schaffer AJ Avery ME: Diseases of the newborn, 4th edn. WB Saunders, Philadelphia
2. Caffey J (1972) Pediatric X-ray diagnosis, 6th edn, Vol 1. Year Book Medical Publishers, Chicago
3. Crosby WM (1979) Automobile injuries and blunt abdominal trauma. In: Buchsbaum HJ: Trauma and pregnancy. WB Saunders, Philadelphia
4. McNeil JP (1964) In: Parkinson EB: Prenatal loss due to external trauma to the uterus. Am J Obstet Gynecol 90:30
5. Scanlon JW, Nelson T, Grylack LJ, Smith YF (1979) A system of newborn physical examination. University Park Press, Baltimore

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