



## Subcutaneous Fat Necrosis of the

### Newborn

Subcutaneous fat necrosis of the newborn (SCFN) is an uncommon disorder characterized by firm, erythematous nodules and plaques over the trunk, arms, buttocks, thighs, and cheeks of full-term newborns. The nodules and plaques appear in the first several weeks of life. Subcutaneous fat necrosis of the newborn usually runs a self-limited course, but it may be complicated by hypercalcemia and other metabolic abnormalities.

The exact pathogenesis of subcutaneous fat necrosis of the newborn is not known. It is postulated that cold or stress-induced injury to immature fat results in the development of solidification and necrosis. A granulomatous infiltrate forms subsequently and nonrenal absorption of calcium increases. Staining of biopsy specimens demonstrates increased levels of 25-hydroxyvitamin D<sub>3</sub> -1 alpha-hydroxylase within the granulomatous infiltrate as is seen in other granulomatous conditions such as [sarcoidosis](#).<sup>1</sup> No other organ systems are involved, unless hypercalcemia intervenes.

Frequency is unknown; subcutaneous fat necrosis of the newborn is rare.

Subcutaneous fat necrosis of the newborn is a harmless, self-limited condition. Significant morbidity (seizures, blindness, [failure to thrive](#)) and even mortality (from infection and cardiac arrest) can result from the associated hypercalcemia.

Race does not play a role in this condition.

Sex does not play a role in subcutaneous fat necrosis of the newborn.

Subcutaneous fat necrosis of the newborn occurs in the first several weeks of life. Hypercalcemia, if it occurs, begins in children aged 1-2 months.

Newborns who develop subcutaneous fat necrosis of the newborn usually are healthy and full-term at delivery but have had some antecedent obstetric trauma, meconium aspiration, asphyxia, hypothermia, or peripheral hypoxemia. Within the first several days to weeks of life, hard, indurated nodules and plaques with ill-defined overlying erythema develop on the trunk, arms, buttocks, thighs, or cheeks. The lesions are not warm. Pain may occur, with a frequency as high as 25% in one series.<sup>2</sup> Congenital ulceration has been reported.

The infants usually appear well and are afebrile. The condition begins as an area of edema and progresses to variably circumscribed nodules and plaques that have a deep, indurated feel, implying a panniculitis. The overlying skin may be red, purple, or flesh-colored and may look taut and shiny. Lesions may become fluctuant and spontaneously drain necrotic fat. If mild hypercalcemia is present, findings might be absent, or the child may display weight loss, irritability, apathy, or hypotonia. Examination may reveal growth and mental retardation, hypertension, seizure activity, and tissue calcification with more severe hypercalcemia.

The cause of subcutaneous fat necrosis of the newborn is not known. Neonatal stress and hypothermia from various sources, such as Rh factor incompatibility, meconium aspiration, placenta previa, umbilical cord prolapse, anoxia, seizures, preeclampsia, maternal cocaine abuse, and hypothermic cardiac surgery, play some role in instigating the process. Some

evidence implicates a maternal hypercoagulable state, such as protein C deficiency and antiphospholipid syndrome, but this is quite variable.<sup>2</sup> One infant developed subcutaneous fat necrosis of the newborn after ice-bag placement for treatment of supraventricular tachycardia. Three possible mechanisms for the development of the necrosis have been proposed.

- An underlying defect in fat composition or metabolism may be present, whereby inadequately developed enzyme systems involved in fatty acid desaturation result in increased saturated fatty acids within the subcutaneous tissue. Neonatal stress may exacerbate this defect and increase the susceptibility to subcutaneous fat necrosis of the newborn.
- The fat of neonates is composed of saturated fatty acids (stearic and palmitic acids) with a relatively high melting point. Neonatal stress resulting in hypothermia may induce fat to undergo crystallization, leading to necrosis.

Local pressure trauma during delivery from macrosomia, forceps, or prolonged trauma may play a role in the induction of necrosis. Subcutaneous fat necrosis of the newborn has been reported in children delivered by cesarean delivery, suggesting that pressure necrosis cannot be the only cause