

Subcutaneous Fat Necrosis in a Newborn

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Abstract: *Subcutaneous fat necrosis (SCFN) is a rare fat tissue inflammation of the newborn. Risk factors include cord prolapse, perinatal asphyxia, therapeutic hypothermia, meconium aspiration and sepsis. When present, hypercalcemia comes with lethargy, hypotonia, irritability, vomiting, polyuria, polydipsia, constipation and dehydration. Kidney injury must be avoided. SCFN is often completely autoregressive.*

Keywords: Hypercalcemia, newborn, perinatal asphyxia, subcutaneous fat necrosis.

1. Background

Subcutaneous fat necrosis of the newborn is an uncommon panniculitis of neonates and its precise incidence is unknown. Classically, red, red - brown, or violaceous subcutaneous nodules and indurated plaques develop on the back, buttocks, proximal extremities, or cheeks within the first few weeks of life. Although SCFN is a self - limiting condition, recognition of this entity is important, as affected infants require monitoring for associated hypercalcemia or other complications. Generally, SCFN has a good outcome, with spontaneous resolution of skin lesions over weeks to months.

Patient Information

A female baby weighing 2.7kg was delivered vaginally at a gestation age of 38 weeks from a pool of meconium; the Apgar score was 7 and 9 at 1st and 5th minutes respectively. Antenatal visit was unremarkable.

The baby was admitted in the neonatal unit due to risk of infection and was given antibiotics empirically as per Hospital guideline.

On the 4th day post admission the baby developed jaundice. Clinically the jaundice was grade 5. Laboratory testing revealed total bilirubin of 295.75micromole/litre, direct bilirubin was 164.85 micromole/litre. Full blood count revealed elevated white blood cell count with thrombocytopenia (platelet count 22.6 per microliter) Serum calcium was slightly increased (11.0 mg/dL) but further monitoring showed spontaneous normalization of serum calcium. She was put on high intensity phototherapy for 4 days. The jaundice subsided on 8th day of life with return of bilirubin to normal ranges.

On 9th day of life the baby presented with painful subcutaneous nodules covered by erythematous skin on both buttocks, measuring 8 to 6 cm in diameter, tender, firm in consistency and fluctuant at some points (picture 1). Initial diagnosis was thought to be infected haemangioma however incision and drainage revealed necrotic fat tissues on both gluteal regions, with approximately 5mls of blood. Hence the diagnosis of **Fat necrosis of the newborn** was made. Necrosectomy was done and the baby was kept on daily wound care.



Picture 1

Post incision and drainage, the wounds continued to have active bleeding for 3 days necessitating blood transfusion of 4units given in different days together with injection vitamin K.

On 13th to 19th day of life she was put on phototherapy again since the jaundice recurred. From 20th day of life the baby continued with daily wound dressing using paraffin gauze till the wounds healed. The child was discharged home on 36th day of life.

On the follow up visits 3, 6 months and 1 year post discharge, she was in good clinical condition appropriate to age growth and neurological development with healed scars on previously SCFN sites (picture 2). The future plan is to excise the scars and flap coverage.



Picture 2

2. Discussion

Subcutaneous fat necrosis of the newborn (SCFN) is a benign condition occurring in the neonatal period, characterized by inflammation with subcutaneous purple bluish hard nodules. Lesions may appear isolated or clustered and are typically located on the shoulders, back, buttocks and face; nodules may evolve into subcutaneous calcifications. (10, 12)

Etiology of this disorder is unknown, but it is linked to multiple neonatal and maternal risk factors (table 1).13, Pathophysiology of SCFN may involve a precocious phase of impaired tissue perfusion with subsequent tissue hypoxia leading to crystallization of neonatal subcutaneous fat, followed by tissue necrosis and granulomatous reaction.12.

Maternal and neonatal risk factors for SCFN of the newborn:

Maternal risk factors	Neonatal risk factors
Preeclampsia	Umbilical cord prolapse
Gestational diabetes	Placenta previa
Use of calcium antagonist	Macrosomia
Rh incompatibility	Meconium aspiration
Use of cocaine	Perinatal asphyxia
Smoking	Neonatal sepsis
	Therapeutic hypothermia
	Familial dyslipidemia and thrombophilia
	Seizures

Subcutaneous fat necrosis is usually a benign condition. Nevertheless it may be associated with thrombocytopenia, hypoglycemia, hypercalcemia and hypertriglyceridemia 1, 3; these metabolic derangements may in turn represent a possible risk for serious complications.8.

Thrombocytopenia is usually synchronous with the appearance of subcutaneous nodules and it is possibly

caused by peripheral platelet sequestration into the lesions.3, 11. This was the case for our patient

Hypoglycemia is reported in literature as another risk factor linked to SCFN but rather than being a cause of SCFN, it seems to be itself a consequence of hypoxia.3.

Hypertriglyceridemia is caused by mobilization of fatty acids from adipose tissue.1.

Hypercalcemia is found in 25% of cases and represents the most serious potential complication, associated with significant mortality and morbidity.5. The first 6 weeks of life represent the time frame at highest risk for clinically significant hypercalcemia in SCFN with 40% of cases occurring in this period.2, 4.

Usually, serum calcium starts to rise as SCFN lesions begin to regress; sometimes hypercalcemia is already detectable before the onset of subcutaneous lesions.10. Neonates with hypercalcemia tend to present with lethargy, hypotonia, irritability, vomiting, polyuria, polydipsia, constipation and dehydration.3. Hypercalcemia is caused by increased prostaglandin activity, release of calcium from necrotic fat tissue and increased secretion of 1, 25 - dihydroxyvitamin D3 from subcutaneous lesions, leading to an increased intestinal uptake of calcium. If left untreated, moderate to severe hypercalcemia may lead to complications as nephrocalcinosis, nephrolithiasis, renal failure; calcification of falxcerebri, skin, myocardium and gastric mucosa may also occur.7.8.

Treatment of hypercalcemia consists of hyperhydration and diet with low levels of calcium and vitamin D; sometimes other drugs like furosemide and prednisolone are needed to decrease serum calcium; bisphosphonates (e. getidronate) may also be employed to treat moderate to severe hypercalcemia when other measures have proven ineffective.13.

In children with a personal history of SCFN it is recommended to evaluate serum calcium levels periodically until the age of 6 months.3.13.

Rarely fluctuant areas of fat necrosis may require needle aspiration or surgical incision and drainage, like in this child.6. Consultations include a dermatologist, a plastic surgeon or pediatric surgeon may be needed if aggressive debridement is needed.

3. Conclusions and Final Remarks

Subcutaneous fat necrosis is usually a transient and self - limited condition. However it may be complicated by a number of metabolic alterations like thrombocytopenia, hypoglycemia, hypercalcemia, and hypertriglyceridemia. It is necessary to monitor newborns with SCFN to avoid the risk of serious complications, with particular reference to hypercalcemia. Regular monitoring of serum calcium is recommended until the age of 6 months, in infants with personal history of SCFN.

Conflict of Interest: No conflict of interest declared.

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