CASE REPORT

Iatrogenic calcinosis cutis in a neonate

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SUMMARY

Calcification of soft tissues occur, secondary to trauma sustained in the course of neonatal intensive care. They can present with swelling and inflammatory signs, which mimic serious infections of bone, joints and soft tissues. The etiology of the presenting inflammatory response is often unknown and the clinical picture is variable. Hence babies get subjected to more invasive procedures and medications. Recognition is by awareness and radiography the key to diagnosis. Masterly inactivity and vigilance during followup is suggested.

BACKGROUND

Calcinosis cutis is an uncommon form of healing following extravasation of intravenous medication in neonates.

CASE PRESENTATION

A 3-week-old male neonate was brought to the outpatient clinic, for the evaluation of swelling on the right lower limb. Conceived to non-consanguineous parents, with an unremarkable antenatal period, had fetal tachycardia at 39 weeks of gestation. Meconium staining of amniotic fluid was noted on rupture of membranes, and so delivered by emergency caesarian section with birth weight 3500 g, APGAR scores 6 at 1 min and 7 at 5 min, with good tone and perfusion. The baby was tachypnoeic with subcostal retractions, and so admitted to the neonatal intensive care unit. Laboratory investigations revealed moderate hypoxia, metabolic acidosis, mild hypocalcaemia and chest x-ray features of meconium aspiration, and so required ventilation. Antibiotics, parenteral fluids, and medications including calcium gluconate were initially administered using the umbilical vein followed by peripheral veins of both upper and lower limbs. He was discharged well, by the 14th day of life on exclusive breast feeds.

A week after discharge, his mother noticed a swelling develop on the right lower limb for which he was evaluated. Nodular swellings noted on the medial surface of the right lower limb were 5–10 mm in diameter, erythematous, with smooth surface and firm in consistency. There was tenderness on palpation, induration involved the whole right leg but joint movements were painless (figure 1). The leg was warm, with no fluctuation or regional lymphadenopathy. The baby had accrued adequate weight for age on breast feeds.

INVESTIGATIONS

Ultrasonography revealed soft tissue swelling of the right lower limb with no changes in the long bones. Incision revealed scanty clotted blood

Figure 1 Photograph showing swelling, erythema of the right leg on day 23.

stained fluid. Analysis of the aspirate revealed no pus cells, or microorganism by stain or culture. The leucocyte count $12 \times 10^9/\text{dl}$ showed 80% polymorphs.

DIAGNOSIS

A diagnosis of thrombophlebitis and early cellulitis was considered in the presence of inflammatory signs around the site of venipuncture above the medial malleolus of the right leg.

TREATMENT

The baby was started on a suspension of ampicillin and cloxacillin. Review after a week showed a progressive larger non-tender swelling, hard in consistency with normal joint movements. Radiograph of the right leg revealed subcutaneous calcification with normal bone contours (figure 2). Biochemical analysis of blood showed normal calcium phosphate and parathormone levels. The baby had grown appropriate for age. Oral antibiotics were stopped after making the diagnosis of iatrogenic calcinosis cutis (figure 3).

OUTCOME AND FOLLOW-UP

The infant was followed up till he completed primary vaccinations at 3 months. The swelling had resolved and disappeared with no residual deformity or disability at 12 weeks (figure 4). The infant was doing well on follow-up.

Figure 2 Radiograph of the right leg showing extra osseous calcification on day 30.

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Figure 3 Diminished erythema with persisting calcified swelling of calcinosis cutis day 55.

DISCUSSION

Virchow described calcinosis cutis in 1855. It is an uncommon disorder characterised by hydroxyapatite crystals of calcium phosphate deposited in the skin.

Etiopathogenesis

The pathogenesis of calcinosis cutis is multifactorial. Repeated attempts to insert a peripheral line, extravasation of solutions or blood into the surrounding tissues causes local tissue damage, temporary elevations of serum and/or tissue calcium, resulting in phlebitis. The extravasated soluble irritants cause coagulative necrosis of tissues and clotting within local blood vessels. Elevation of local tissue pH level cause calcium salts to precipitate. Free fatty acids released after fat cell necrosis contribute secondarily to the initiating process and insoluble calcium compounds get deposited within the skin.^{1 2}

Calcinosis cutis is classified into five major types according to etiology:³

- ▶ Dystrophic variety: It occurs in traumatised tissues with normal serum calcium and/or phosphorus ratio.
- ▶ Metastatic variety: It occurs in normal tissues in the presence of a disturbed calcium and/or phosphorus ratio.
- ▶ Iatrogenic calcinosis cutis: Rare but observed in babies who are subjected to multiple heel pricks, punctures for intravenous access in intensive care units, administration and extravasation of calcium or phosphate containing infusions or medications.
- ▶ Calciophylaxis: Calcification is induced here in small vessels of the dermis as a result of hypersensitivity, after exposure to certain challenging agents, and after a critical lag time.
- ▶ Idiopathic: None of the above mentioned is identified.

This prevailing classification has been critically reviewed.⁴

The pattern of calcification is determined by the site and extent of extravasation along the blood vessel sheaths or fascial planes. Soft tissue calcifications show distinctive patterns varying from an amorphous mass localised to the site of

Figure 4 Resolution of swelling with no deformity day 90.

injection to extensive areas of vascular, perivascular calcifications and rarely annular distribution as in this case. The mean period reported between infusion and appearance of a clinical lesion is 13 days (range, 2 h to 24 days). Massive extravasations may cause sloughing of the overlying skin with secondary infection.

Calcium solutions used therapeutically are radiolucent. Consequently only radiographs taken at 7 days to 3 weeks after infusion demonstrate calcification in the soft tissues. Local inflammatory signs are frequently present, which is mistaken for cellulitis, osteomyelitis, arthritis, abscess, periostitis, myositis ossificans and thrombophlebitis, etc. These patients consequently get subjected to various invasive procedures to determine etiology as in this case.

Management

Intralesional triamcinolone acetonide infiltration, diltiazem, and surgical interventions to reduce local signs have been proposed as treatments for calcification of tissues. However, treatment should remain conservative and based on the individual scenario, as the further course of calcinosis cutis is benign in neonates.

Prognosis

In most reported cases, progressive clearing of calcification occur without any special treatment 8 weeks after the onset or by 6 months, when all evidence of tissue calcification resolve,⁵ as noted in our patient.

Learning points

- ▶ This case report describes an uncommon diagnosis of calcinosis cutis in a neonate.
- ▶ Importance is on identification of this uncommon albeit innocent condition, and the avoidance of the unnecessary use of antibiotics or surgical procedures.
- ▶ Surgical intervention is clearly not indicated in this condition. Presence of fluctuation with radiographic features of calcification mandates only a needle aspiration to ascertain a pyogenic cause.
- ▶ Diagnosis rests on a hard consistency observed on clinical examination with radiological evidence of soft tissue calcification, present when local inflammatory signs are noticed.
- ▶ One should, however, maintain a high index of suspicion for pyogenic infections by keeping follow-up of the patient.

Competing interests None.

Patient consent Obtained.

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