Atypical Swelling On Extremities of A Newborn Due To Iatrogenic Calcinosis Cutis

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Abstract

Observation: This case report describes atypical presentation of iatrogenic calcinosis cutis in neonate. Iatrogenic calcinosis cutis usually presents by swelling erythema, induration, and soft tissue necrosis. Thus calcinosis cutis is usually easy to diagnose for clinicians. However, when extravasation is minor, the etiological relation of extravasation and calcification may not be obvious. Because of these reason, radiological findings are very important and they are usually the key to the diagnosis. A careful differential diagnosis from hematoma, abscess, or cellulitis prevent the patients from misdiagnosed and overtreatment.

Introduction

Calcinosis cutis, which is also called subcutaneous calcium deposits, is characterized by abnormal deposits of calcium salts in the dermis and/or hypodermis [1]. This uncommon disorder has been reported only as case presentation in newborns and it is classically categorized into three types: metastatic, dystrophic, and idiopathic [2, 3, 4]. We here report an atypical iatrogenic calcinosis cutis case without local erythema and ulceration of intravenous calcium therapy in a term newborn.

Case Report

A 3550-g male newborn was born vaginally to a 20-year-old mother at 396/7 gestational weeks after an uneventful pregnancy. He had neonatal hyperbilirubinemia due to ABO incompatibility and underwent phototherapy on the 2nd day of life. Routine clinical biochemical analysis on 3rd day of life revealed hypocalcemia (6.8 mg/dl, N: 8.5-10.1), hyperphosphatemia (7.2 mg/dl, N: 2.5-4.5), hypomagnesemia (1.26, 1.8-2.6 mg/dl) in addition to mildly high serum parathyroid hormone (PTH) (65.9 pg/ml, N:15-65) and low 25 OH-vitamin D levels (9.3 μg/L, N:25-80). The other laboratory analysis including serum alkaline phosphatase (ALP), thyroid function test, renal functions and urine analysis were normal. Maternal laboratory analysis were normal except for low 25 OH-vitamin D level.

The patient received 10% calcium gluconate (300 mg/kg/day) intravenously and 1200 U/day vitamin D (D-vit 3®, Deva, Istanbul-Turkey) orally for early neonatal hypocalcemia due to maternal 25 OH-vitamin D deficiency. Daily calcium gluconate was infused intravenously as divided into four doses in 4 ml of normal saline. Elementary oral calcium lactate (50 mg/kg/day) was started after 4 days of intravenous calcium and lasted upto two days prior to discharge. The patient was discharged with only vitamin D supplement as 1200 U/day on postnatal 11th day of life.

He was rehospitalized to the neonatal intensive care unit due to fever (380C) and swelling on the...
dorsum of right wrist, left forearm and medial side
of right ankle 8 days after the discharge. Swellings
were confined properly without erythema or ulcer-
ation and were non-fluctuant with the largest size
of 2x3 cm (Figure 1a). Lesion sites on extremities
were appropriate with application of intravenous
calcium infusions on his previous hospitalization.
The patient had sign of rapidly increasing swelling
without erythema on the right wrist within one
day.

Radiographs of the right forearm showed extra-os-
seous calcification extending over the right uncle
(Figure 1b). Ultrasonography revealed hypert-
rophy of subcutaneous soft tissue without cystic
or solid mass. His abdominal, renal and cranial
ultrasonographies and echocardiography were
normal. His laboratory evaluation was also in nor-
mal ranges and therefore hematoma, abscess and
cellulitis were excluded in differential diagnosis.
Iatrogenic calcinosis cutis was diagnosed both cli-
cinally and radiologically. Vitamin D treatment
was reduced to 400 IU/day and he was discharged
after 4 days of hospitalization. All swellings on ext-
remities disappeared without any treatment within
two month on outpatient follow-up.

Discussion

The clinicoradiological diagnosis of this case
was iatrogenic calcinosis cutis due to intra-
venous calcium therapy. Although iatrogenic
calcinosis cutis with extravasation of calcium
therapy or secondary to trauma have been re-
ported in the literature, cases without eryt-
hema or ulceration were very rare especially
in newborns [2, 4, 5].

Calcinosis cutis is separated into five subty-
types as dystrophic calcification, metastatic
calcification, idiopathic calcification, iatroge-
nic calcification, and calciphylaxis according
to recent data [6]. Dystrophic calcinosis cutis
occurs in damaged and traumatized tissues
and the serum calcium and phosphorus levels
are normal ranges. Calcium deposits ap-
pear in previously inflamed, degenerated,
or neoplastic tissues, and cutaneous involve-
ment is a common feature [1, 7, 8]. Metasta-
cic calcification is characterized by an
abnormal calcium and/or phosphate metabo-
lism, leading to the precipitation of calcium
in cutaneous and subcutaneous tissue. Idio-
pathic calcification occurs without any un-
derlying tissue damage or metabolic disorder.
Calciphylaxis presents with small vessel cal-
cification mainly affecting blood vessels of the
dermis or subcutaneous fat. Disturbances in
calcium and phosphate metabolism and
hyperparathyroidism can be observed [6].

Iatrogenic calcinosis cutis has various causes
including intravenous calcium therapy which
can occur with or without extravasation of
calcium solution. Tissue damage and transi-
tent elevation of the local calcium concentra-
tion are the theories for iatrogenic calcinosis
cuts. Some of these lesions are observed in
low birth-weight babies subjected to multiple
heel pricks in intensive care units. Local tis-
 sue injury increases cell membrane permea-
bility, allowing cytosolic influx of calcium that
exceeds the capacity of mitochondria to se-
quester calcium and phosphate. Thus, cal-
cium phosphates are precipitated in the
cytoplasm. In calcinosis that is caused by ext-
ravasated calcium, the primary pathologic al-
terations described are collagen degeneration
and soft-tissue necrosis [1].

Swellings were observed 8 days after the end
of intravenous calcium therapy in our pati-
ent. The lesions generally appear with an ave-
rage of 13 days after the extravasation of the
calcium solution, with a range of 2 h to 24 days [1, 5]. Radiological changes are seen as early as 4–5 days and maximal radiological changes are present at about 2 weeks. The radiological findings are of great importance because they are usually the key to the diagnosis, which may be otherwise not clinically suspected [3]. Gradual resolution usually takes several months like our patient [1]. There is no specific mode of treatment except supportive management and (if necessary) a skin graft. Most infants completely recover without functional deficit [1, 3, 6].

When massive extravasation of calcium infusion is followed by swelling, erythema, induration, and soft tissue necrosis, calcinosis cutis is usually easy to diagnose [3]. However, when extravasation is minor, the etiological relation of extravasation and calcification may not be obvious. In such cases, calcinosis cutis has been diagnosed as a hematoma, abscess, or cellulitis and treated as such; therefore, a careful differential diagnosis is necessary [8]. In our case, lesions presented as soft tissue swelling without erythema, necrosis or ulceration. In order to avoid over-diagnose and unnecessary treatment, calcinosis cutis should be considered especially in patients who experienced intravenous calcium treatment.

References