Case 4
Bony plaque on the leg

Patient: A 22-year-old Thai woman from Lopburi

Chief complaint: Bony consistency plaques on left leg since the age of 7

Present illness:
The patient has developed a slowly progressive hard indurated plaque on her left leg since she was 7 years old. She denied previous major trauma to her left foot and leg. The plaques progressed over time, extended from left foot to below knee region. There was bony-like material extruded from the lesion when she scratched. She also had loose, lax skin over the hard plaques.

Past history:
- She was born at term following as uneventful pregnancy to nonconsanguineous parents.
- She has no underlying disease.

Family history:
No similar skin lesion among family members

Physical examination:
Height 160 c.m., Weight 52.5 kg.
HEENT: No heliotrope, no alopecia, normal hearing
Cardiovascular and respiratory system: WNL
Abdomen: Soft, not tender, no hepatosplenomegaly
Central nervous system: WNL
Musculoskeletal: Mild limit ROM of left big toe, no sclerodactyly, no brachydactyly, no scoliosis and kyphosis
Skin examination:
- A large indurated skin–colored bone-like plaque with multiple hard brownish papulonodular surface extending from dorsal surface of left foot to lateral aspect of proximal part of left leg
- The overlying skin is loss of elasticity

Histopathology: (S14-17627, left leg)
- A proliferation of loose connective tissue composed of thin collagen bundles, scattered wavy small spindle cells with abundant mast cells
- Bone trabeculae composed of osteocytes and central fatty tissue among loose connective tissue

Investigation:

Laboratory tests
- Serum calcium, phosphate, parathyroid hormone: Normal
- 25-OH vitamin D level: 17.7 ng/ml (≥30 ng/ml)
- GNAS1 gene mutation: Pending

Imaging study
- Film X-ray left foot and leg:
  - Extensive patchy/plaque-like skin and soft tissue calcification along the distal left leg and foot
  - Deformities of 3rd and 4th metatarsal bones left foot

Diagnosis: To be discussed

Treatment: To be discussed

Discussion:
Cutaneous ossification is a rare lesion of the skin encountered as both primary and secondary process. Primary cases are seen in the absence of any other preexisting lesion, whereas secondary cases are seen in relation to either neoplastic or inflammatory processes.1

Primary cutaneous ossification have included entities such as progressive osseous heteroplasia (POH), fibrodysplasia ossificans progressiva (FOP), Albright hereditary osteodystrophy (AHO), plate-like osteoma cutis and miliary osteoma of the face as describes in table 1.2-5 Therefore careful evaluation of calcium-phosphate metabolism, combined with an assessment for associated systemic abnormalities, family history of unusual cutaneous ossification are necessary for the correct diagnosis.

Secondary cutaneous ossification have been reported in a variety of diseases, including pilomatricoma, basal cell carcinoma6, acne, melanocytic nevi, cellular blue nevus, scars, cutaneous mixed tumors, cylindromas, subcutaneous nodules of mixed connective tissue disease, dermatofibroma7, ossifying plexiform tumor8, pyogenic granuloma, cutis laxa–like pseudoxanthoma elasticum, organoid nevi, epidermal and dermoid cysts, and sites of trauma or injection.1

The investigation for calcium-phosphate metabolism should be done in cutaneous ossification patient including serum levels of calcium, inorganic phosphate, alkaline phosphatase, parathyroid hormone (PTH) and vitamin D metabolites. Histopathology of cutaneous ossification shows well formed bony spicules with prominent cement lines and calcification. They may demonstrate
osteoblasts, osteoclasts, osteocytes and occasionally may even reveal bone marrow elements.

Our patient has developed progressive cutaneous ossification on her left foot and leg since she was 7 years old. She has neither anatomical nor significant laboratory abnormality. Histopathology of the lesion shows proliferation of loose connective tissue composed of thin collagen bundles, scattered wavy small spindle cells with abundant mast cells, bone trabeculae composed of osteocytes and central fatty tissue.

Currently, the results of GNAS1 gene mutation testing and special stains of the lesion (S 100, neurofilaments, factor 13a) are pending. Consequently the diagnosis for this patient will be discussed in the conference.

Table 1: The differential diagnosis of primary cutaneous ossification

<table>
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<tr>
<th></th>
<th>FOP</th>
<th>POH</th>
<th>AHO</th>
<th>Plate-like osteoma cutis</th>
<th>Miliary osteoma of the face</th>
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<td>Mechanism of ossification</td>
<td>Endochondral</td>
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<td>Obesity, brachydactyly, short stature, PTH resistance</td>
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<td>Genetic mutation</td>
<td>ACVR1 gene</td>
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References: