Subcutaneous granuloma annulare, multiple lesions - MRI findings

A 5-year-old female patient with rapidly growing, painless, multiple subcutaneous nodules, on both pretibial areas, was admitted to our department. The patient's past medical history was unremarkable and there was no history of trauma. An MRI examination of both tibial regions was requested due to the rapid growth of the subcutaneous nodules.

MRI examination revealed multiple subcutaneous nodules on both pretibial areas. The lesions had irregular margins and appeared isointense to the muscle on T1-weighted images. On T2-weighted images and STIR images the lesions demonstrated high signal intensity. On diffusion-weighted imaging (DWI), the lesions demonstrated restricted diffusion. On T1-weighted images after gadolinium injection, the lesions showed strong homogeneous enhancement. There was no evidence of calcium inside the lesions. There was no pathological signal intensity nor pathological enhancement in the cortex and bone marrow of both fibula and tibia. The MRI findings, in combination with clinical history, were indicative of multiple lesions of subcutaneous granuloma annulare. A biopsy was performed which confirmed the diagnosis of subcutaneous granuloma annulare.

Granuloma annulare is an uncommon, palisading, benign inflammatory dermatosis which may be generalized, localized, perforating, or subcutaneous. The first three types are cutaneous and are diagnosed and managed by dermatologists. The subcutaneous form is the most frequently encountered by radiologists and is seen almost exclusively in children, with the greatest frequency of occurrence at 2–5 years of age. Children are usually healthy without significant previous history.

Subcutaneous granuloma annulare (SGA) most often manifests as a solitary, painless, non-mobile, superficial mass with no associated overlying cutaneous abnormality, located usually in the pretibial region. Other sites of involvement include the upper extremity, buttocks, and face or scalp.

SGA can present a diagnostic challenge, especially when the physician is unfamiliar with this clinical entity. It is the
most frequently biopsied benign soft tissue mass in the lower extremity of children under the age of 5. Ultrasound is useful, but MRI provides the greatest amount of diagnostic information about the characteristics of soft tissue abnormalities. The MRI features are non-specific, but MRI can help exclude other entities which can present similarly, and can be helpful when the clinical features of SGA are atypical or are not recognised.

On ultrasound, SGA appears as an ill-defined hypoechoic nodule without internal vascular flow or cystic lesion. MRI mostly reveals a subcutaneous mass with indistinct margins. SGA demonstrates decreased signal intensity on T1-weighted images and may be of variable signal intensity on T2 weighted sequences, with peripheral high signal intensity due to perilesional oedema. There is diffuse enhancement of the lesions after gadolinium injection. DW images show high signal due to diffusion restriction.

Many cases of SGA resolve spontaneously within a few years. The radiological appearance of SGA is characteristic and, combined with the age of the patient and location of the lesion, can suggest the diagnosis. Occasionally, in atypical cases, the patients undergo biopsy to confirm the radiologic diagnosis. Both radiologists and physicians must be aware of this entity in order to avoid excessive diagnostic testing and inappropriate therapy.

**Differential Diagnosis List:** Subcutaneous granuloma annulare, Rheumatoid nodules, Foreign-body reactions, Fat necrosis, Haematomas, Abscesses, Inflammatory granulomas

**Final Diagnosis:** Subcutaneous granuloma annulare

**References:**

Sunny Chung, MD, Donald P. Frush, MD, Neil S. Prose, MD, Christopher R. Shea, MD Tal Lair, MD, George S. Bisset, MD (1999) Subcutaneous Granuloma Annulare: MR Imaging Features in Six Children and Literature Review. RSNA (PMID: 10207490)


Description: Multiple ill-defined nodules of subcutaneous granuloma annulare on both pretibial areas. The nodules are located in the subcutaneous tissue and demonstrate high signal intensity on STIR images. Origin: Ippokrateio General Hospital Thessaloniki, MRI Department
Description: The lesions appear isointense to the muscle on T1–weighted images. Origin: Ippokrateio General Hospital of Thessaloniki, MRI dep.
Figure 3

Description: The lesions demonstrate restricted diffusion on DWI. Origin: Ippokrateio General Hospital of Thessaloniki, MRI dep.
Description: The lesions demonstrate restricted diffusion on DWI. Origin: Ippokrateio General Hospital of Thessaloniki, MRI dep.
Description: The lesions demonstrate intense and relatively homogeneous enhancement after gadolinium administration. There is no evidence of cortical and bone marrow involvement of both tibia and fibula. Origin: Ippokrateio General Hospital of Thessaloniki, MRI Dep.
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