

# MRI of subcutaneous granuloma annulare: a series of four cases

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## INTRODUCTION

- Group of benign dermatoses – cutaneous or subcutaneous lesion
- Children between 2-5 years old
- Clinically: painless, nonmobile subcutaneous lump (+/- skin manifestations)
- US and MRI -> ill-defined mass with various vasculazation patterns
- Clinical diagnosis can be challenging -> unnecessary invasive work-up (biopsy)

## CASE REPORT

- 9-year old girl presented to the dermatologist – one month history of a lump at the dorsal side of the forefoot
- Nonmobile elastic painless mass between the 2. and 3. metatarsals with no overlying skin manifestations
- US -> hypochoic non-vascularized subcutaneous mass (Figure1)
- Simultaneously – lesion at the level of the tibiotalar joint (Figure2)
- MRI of foot and ankle-> ill-defined subcutaneous masses of the 2. MTP joint (Figure 3) and talocrural joint(Figure 4)
- One year monitoring of both lesions -> moderate change of overlying skin was noted (dermatoscopically typical for SGA)
- Locally treated with methylprednisolone aceponate -> complete regression afeter five years

## COMPANTION CASES

- 5,6 and 10 years
- MRI of the ankle
- Two were similar to the first case (Figure 5 and 6)
- In a 10-year old girl it was mildly hypointense and heterogenous on fluid-sensetive sequences (Figure 7)

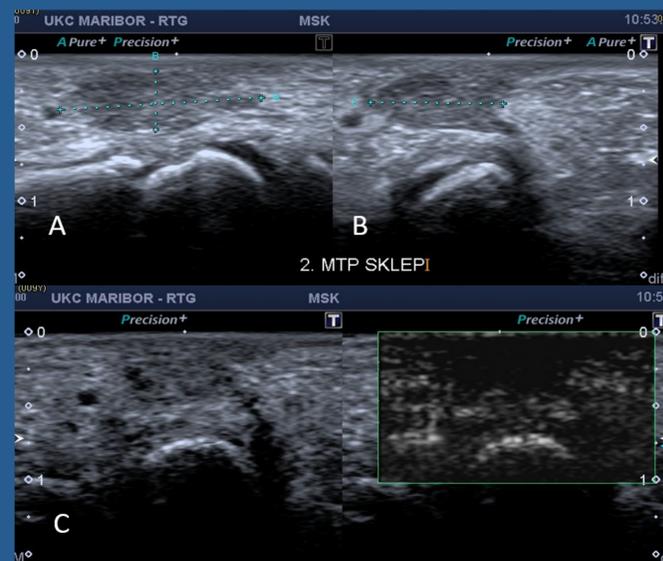


Figure 1: Ultrasound (US) image of the right forefoot demonstrates oval mildly hypochoic heterogenous subcutaneous mass dorsally at the level of second metatarsophalangeal joint in sagittal (A) and transverse (B) plane (between blue markers). Doppler examination (C) does not demonstrate vascularity.

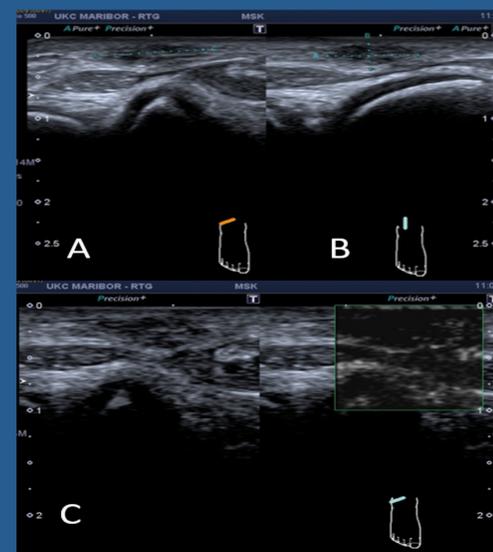


Figure 2: US of the right ankle. Additional subcutaneous mass is demonstrated anterolaterally at the level of the talocrural joint (between blue markers) in the transverse (A) and sagittal plane (B). Again, no vascularity is demonstrated on the Doppler examination (C).

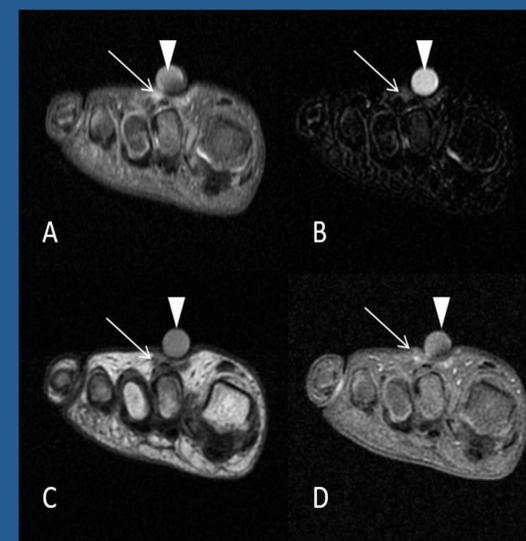


Figure 3: MRI of the right forefoot in the transverse plane at the level of metatarsophalangeal joints. An ill-defined subcutaneous mass of irregular shape (arrows). It is moderately hyperintense on fat-suppressed proton density (PDFS) (A) and short-tau inversion recovery (STIR) (B) images, T1 hypointense (C) with moderate inhomogeneous contrast enhancement on fat-suppressed T1 image (D). Note the compression of the lesion by a skin marker.



Figure 4: MRI of the right ankle. An ill-defined subcutaneous mass next to the tendon of the long extensor of fingers (arrow) is hyperintense in PDFS in the transverse (A) and sagittal (B) plane, hypointense on T1-weighted image (C) with intense enhancement after intravenous contrast administration on transverse fat-suppressed T1 image (D). Note that mass is enhancing more intensively and homogenously as the mass in the forefoot (Figure 3).

## DISCUSSION

- Soft tissue tumors in children are rare and mostly benign
- Most common benign masses represent haemangioma (15%), fibromatosis (11%), granuloma annulare (10%), infantile myofibromatosis (8%) and lipoblastoma (8%)
- Located in the lower limbs (but can also occur in the upper extremities, face, scalp, buttocks and heel)
- First imaging modality should be the US (clinical practice – MRI first)
- Typical US findings- > ill-defined moderately hypochoic mass, with various degrees of vascularity assessed with the Doppler examination
- Isointense or slightly hypointense to muscle on T1-weighted MR images
- On fluid-sensetive sequences the lesion appears hyperintense, with various degrees and patterns of contrast enhancement
- I.v. contrast was administreted only in first case (potential risk of paramagnetic contrast / low specificity!)
- At MRI, small lesions could be easily overlooked! (children – motion artifacts!) – placement of a skin marker (Figure 3)

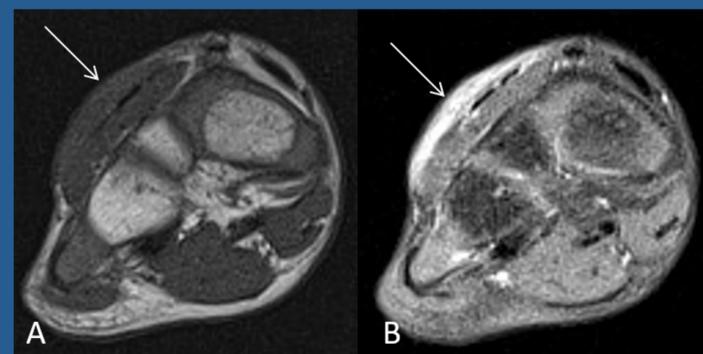


Figure 5: Companion case No. 1. A five-year old boy with a palpable lump. An ill-defined subcutaneous mass of the dorsal forefoot next to extensor tendons of fingers (arrow) is isointense to muscle on T1-weighted coronal image (A) and hyperintense on coronal PDFS image (B).



Figure 6: Companion case No. 2. A 6-years old boy with a palpable mass. A subcutaneous mass in the subcutaneous tissues of the anterolateral ankle is isointense to the muscles on a sagittal T1 image (A) and moderately hyperintense on axial PDFS image (B).



Figure 7: Companion case No. 3. A 10-year old girl with a palpable lump. Sagittal MRI of the right ankle (A) demonstrates hypointense subcutaneous soft-tissue mass (arrows) with T1 isointense signal to muscle on sagittal image (A), moderately T2 hypointense (B), and mildly hyperintense heterogenous PDFS (C) signal on axial images. A heterogenous and moderately hypointense signal on fluid-sensitive sequences (B, C) represents possibly a chronic lesion with fibrotic changes or hemosiderin after small bleeding into the lesion.

## CONCLUSION

SGA is a rare self-limiting benign subcutaneous soft-tissue mass typically appearing in lower limbs in early childhood. With a broad differential diagnosis, both detailed clinical data for location the lesion on MRI as well as proper interpretation of MRI findings are necessary for establishing the correct diagnosis without the unnecessary invasive work-up.

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