**Muscle Mayhem: MR Imaging Patterns of Myositis**

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**INTRODUCTION**

There are many causes of muscle swelling and pain, some of which can be serious. Imaging findings are nonspecific and demonstrate high signal intensity on the affected muscle groups on fluid-sensitive (T2 WI) images. The pattern and distribution of the signal abnormality is helpful in determining the cause of the swelling. Several conditions are outlined below, with an emphasis on dermatomyositis, rhabdomyolysis, and necrotizing fasciitis.

**RHABDOMYOLYSIS**

Rhabdomyolysis is a polymicrobial infection of the soft tissues that can lead to severe muscle injury. Causes include trauma, shock, sepsis, seizures, drug abuse and extreme exercise. Rhabdomyolysis may be complicated by compartment syndrome resulting in muscle infarction and necrosis. Findings on imaging include muscle enlargement, muscle edema and enhancement following intravenous gadolinium.

**DERMATOMYOSITIS**

Juvenile dermatomyositis is the most common type of idiopathic inflammatory myopathy in children. Patients present between 5-14 yrs with progressive symmetric muscle weakness and difficulty walking. It most frequently involves the gastrocnemius and soleus muscles and most commonly occurs in the first or second decade with a mean age of 9 years. In our experience with seven patients and present our findings.

**DEEP CELLULITIS**

Deep cellulitis may be complicated by compartment syndrome resulting in muscle infarction and necrosis. Causes include trauma, surgery, burns, insect bite or varicella infection; other causes include trauma, surgery, burns, insect bite or varicella infection. Imaging findings may overlap with necrotizing fasciitis.

**NECROTIZING FASCITIS**

NF is a rapidly spreading infection, leading to extensive polymicrobial infection of the soft tissues, characterized by Group A streptococcal infection. NF may be seen after recent infection, prior to recent bacterial infection, in elderly patients, diabetics or immunosuppressed individuals. The infection begins in the superficial fascial planes, but spreads rapidly to involve deeper fascial planes and overlying skin. Deep cellulitis, recognition of early signs and symptoms, and prompt surgical debridement is essential to prevent significant morbidity or death. MR is helpful in evaluating the extent of the process.

**CASE 3: RHABDOMYOLYSIS**

3 year old girl brought to ER in full cardiac arrest. Figure (a) and (b): Coronal and sagittal FS T2 WI; There is inhomogeneous, hyperintense signal in the enlarged pronator quadratus muscle (asterisk), the subcutaneous tissues and the deep fascial planes as well as in the periphery of the quadriceps muscle deep to the area of high signal on FS T2 WI in the thigh and pelvic musculature. Deep fascial edema, with little superficial fascial and subcutaneous edema is present. Figure (c) and (d): Axial and coronal T1 WI; There is enhancement of the pronator and the surrounding subcutaneous tissues to a lesser degree than the other causes of myositis. There is no significant muscle enhancement.

**CONCLUSION**

- FS T2 WI and post contrast T1 WI are useful in differentiating between the changes caused by muscle and surrounding tissue involvement in children with myositis.
- While the MR findings are not specific, the pattern of signal abnormality on T2 WI and post contrast images is helpful in determining the cause of childhood myositis.
- Graft-versus-host (GVH) related myositis and dermatomyositis involve the superficial soft tissue for a longer duration than the other causes of myositis.
- BACM, NF, dermatomyositis and rhabdomyolysis demonstrate significant overlap with imaging findings. Imaging correlation with clinical and laboratory findings is essential.
- MR is helpful in evaluating the extent of the process.

**REFERENCES**