Muscle Pathology Across a Spectrum: Tips to Diagnose Common Muscle Diseases with Varied Presentations

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Case-Based Questions (please see page 3 for answers)

1.	You receive a muscle biopsy from a 62-year-old female with limited clinical history available. There are subtle pinpoint basophilic foci within the sarcoplasm. What stain would be most helpful to confirm the presence of very small vacuoles?	
	a.	Acetylcholinesterase
	b.	Alkaline phosphatase
	c.	Gomori trichrome
	d.	NADH

2.	You are reviewing a muscle biopsy and there is a concern for immune-mediated necrotizing myopathy. What histopathologic finding would be supportive of the diagnosis?	
	a.	Extensive endomysial chronic inflammation
	b.	Infarct of skeletal muscle fibers
	c.	Perifascicular necrosis
	d.	Sarcolemmal deposition of complement C5b-9

3.	You are reviewing a muscle biopsy from a 1-year-old child with a highly elevated CK and there is extensive endomysial fibrosis, fiber size variation, and necrosis/regeneration. There are no groups of atrophic fibers. Out of the entities listed below, which should be considered in addition to a muscular dystrophy?	
	a.	Congenital myasthenic syndrome
	b.	Congenital myopathy
	c.	Mitochondrial myopathy
	d.	Spinal muscular atrophy

Scroll to Page 3 for answers

Correct Answers and Rationales

Question 1 Correct Answer and Rationale: **A: Acetylcholinesterase**

Rationale: Vacuoles with sarcolemmal features will be highlighted with acetylcholinesterase staining. The other stains cannot identify vacuoles, specifically.

Question 2 Correct Answer and Rationale: **D: Sarcolemmal deposition of complement C5b-9**

Rationale: Out of all answer choices, the only consistent finding in immune-mediated necrotizing myopathy (IMNM) is sarcolemmal deposition of complement C5b-9. It is seen very commonly. IMNM is typically pauci-inflammatory, does not show evidence of infarcts, and the necrosis is scattered throughout without perifascicular localization.

Question 3 Correct Answer and Rationale: **C: Mitochondrial myopathy**

Rationale: Mitochondrial myopathies can present histopathologically similar to a muscular dystrophy, particularly those with mitochondrial DNA depletion syndromes. Congenital myasthenic syndrome and congenital myopathy do not typically present with these findings. The lack of grouped atrophic fibers makes spinal muscular atrophy (SMA) unlikely, although you can see necrosis/regeneration in SMA as a secondary myopathic change.