



Canadian Association
of Neuropathologists
Association canadienne
des neuropathologistes

CANP Resident Workshop 2025 Interactive Microscopy in Neuromuscular Pathology

Objectives:

1. Review the key histological features of various neuromuscular diseases including inflammatory myopathies, muscular dystrophies, congenital myopathies.
2. Formulate differential diagnoses for various histopathologic patterns of neuromuscular disease.
3. Discuss the appropriate handling and workup of muscle and nerve biopsies.

Cases 1 to 4: Dr. Benjamin Ellezam

Provided are 4 cases of dermatomyositis.

Can you guess for each what is the autoantibody on serology?

What is the main histologic differential diagnosis for each?

Case 1 : 50-year-old female with mild weakness, Raynaud, Gottron and palmar papules, and pulmonary ground glass opacities. CK 500.

Slide: H&E

Case 2 : 59-year-old female with 2-month history of proximal weakness, periorbital rash, CK 6000.

Slide: HPS

Case 3 : 75-year-old female with subacute proximal weakness, severe DM rash, and ovarian cancer. CK 1800.

Slide: HPS

Case 4 : 66-year-old female with proximal weakness and myalgia. No obvious rash. Normal CK

Slide: HPS



Cases 5 to 7: Dr. Jeffrey Joseph

Case 5 (119)

History: 53-year-old man who developed joint pain about three years ago and over the last year began to notice lower extremity weakness mainly in hip girdle muscles. Myopathic features were identified in his EMG studies. Medications included methotrexate and hydroxychloroquine.

Laboratory Values:

- Creatine kinase (CK): normal to low elevated; range from 241 to 495 (normal 30-350 U/L);
- Autoimmune Myopathy/Myositis/Synthetase syndrome panel*: high positive anti-cytosolic 5'-nucleotidase 1A-Mup44 (150; high positive ≥ 90)

Scanned Slides: H&E
 Gomori trichrome
 CD8
 MHC-class II
 Phosphorylated TDP43

Case 6 (028)

History: 49-year-old man who noticed some balance issues and then began developing weakness in his finger flexors (gripping items) and knee extension several years ago. Weakness progressed to other muscles. His father also developed similar symptoms several years ago and had a muscle biopsy consistent with inclusion body myositis (IBM).

Examination demonstrated wasting of and weakness in the quadriceps bilaterally and weakness in his finger flexors.

Laboratory Values: Creatine kinase (CK): 622 (normal: 30-350 U/L)

Slides: H&E
 Gomori trichrome
 CD8
 MHC-class II
 Phosphorylated TDP43

Case 7 (118):

History: 74-year-old man with hypertension, atherosclerosis, obesity and multiple cardiac complications (dilated cardiomyopathy, atrial fibrillation, dilated ascending aorta); prostate cancer, a myopathy and neuropathy. History of alcohol use and on multiple medications.



A neuromuscular note indicated a two-year history of progressive weakness worse on his left. He first noticed handgrip weakness (holding things, screwing open bottles, opening a can of pop). He also noticed weakness in his arms when trying to shovel his driveway, and difficulty getting out of a chair and going up stairs. NCS compatible with a sensorimotor length-dependent axonal poly neuropathy and EMG demonstrated a combination of myopathic and neurogenic changes.

Laboratory Values:

- Creatine kinase (CK): 860 (normal: 30-350 U/L)
- Autoimmune Myopathy/Myositis/Synthetase syndrome panel*: weak positive for anti-Mi-2 beta (24; weak positive 11-29)

Slides: H&E
 Gomori trichrome
 CD8
 MHC-class II
 Phosphorylated TDP43

*Autoimmune myopathy/myositis/synthetase panel included Mi-1 alpha, Mi-2 beta, TIF1 gamma, MDA5, NXP2, SAE1, Ku, Mi-2, PM/Scl-100, PM/Scl-75, Jo-1, PL-7, PL-12, OJ, EJ, Ro52, SRP, HMGCR, antiMup44

Cases 8 and 9: Dr. Peter Schutz

Case 8 (Case PS 1)

Clinical Vignette: 41-year-old male; Slowly progressive weakness over decades; Lower extremities: proximal weakness, left greater than right (difficulties with stairs); Upper extremities: mild proximal, more pronounced distal weakness (grip; opening bottles); Ptosis; No dysphagia or choking

Slides Gomori trichrome
 NADH

Case 9 (Case PS 2)

Clinical Vignette: 41-year-old male, proximal muscle weakness; elevated CK
 Exercise intolerance with cramps, myalgias;
 Exercise tolerance improves after brief rest

Slides: Gomori trichrome
 PAS



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Case 10 and 11: Dr. Leslie Hamilton

Case 10 (LH Case 1):

Clinical Vignette: 69 year old man. Longstanding history of mild proximal weakness with mildly elevated CKs; no facial weakness.

Slides: H&E
Gomori trichrome
NADH

Case 11 (LH Case 2):

Clinical Vignette: 60 year old woman. History of profound progressive weakness and anasarca with rapid functional decline ?rheumatologic disorder. Labs: RF 124, ANA 1:160, ENA, anti-Smith, Anti-Ro, anti-La, Anti-Jo, anti-dsDNA and ANCA all positive. Myositis panels negative. Muscle biopsy showed type II atrophy only. NCS showed length-dependent axonal sensorimotor polyneuropathy. Clinical impression of motor neuronopathy or confluent mononeuritis multiplex.

Slides: H&E (paraffin)
Gomori trichrome (frozen)
Toluidine blue semithin