Early Diagnosis and Intervention in DMD

Patient #1: DMD Early Diagnosis & Treatment

18 y/o Male

Case contributor and commentary:
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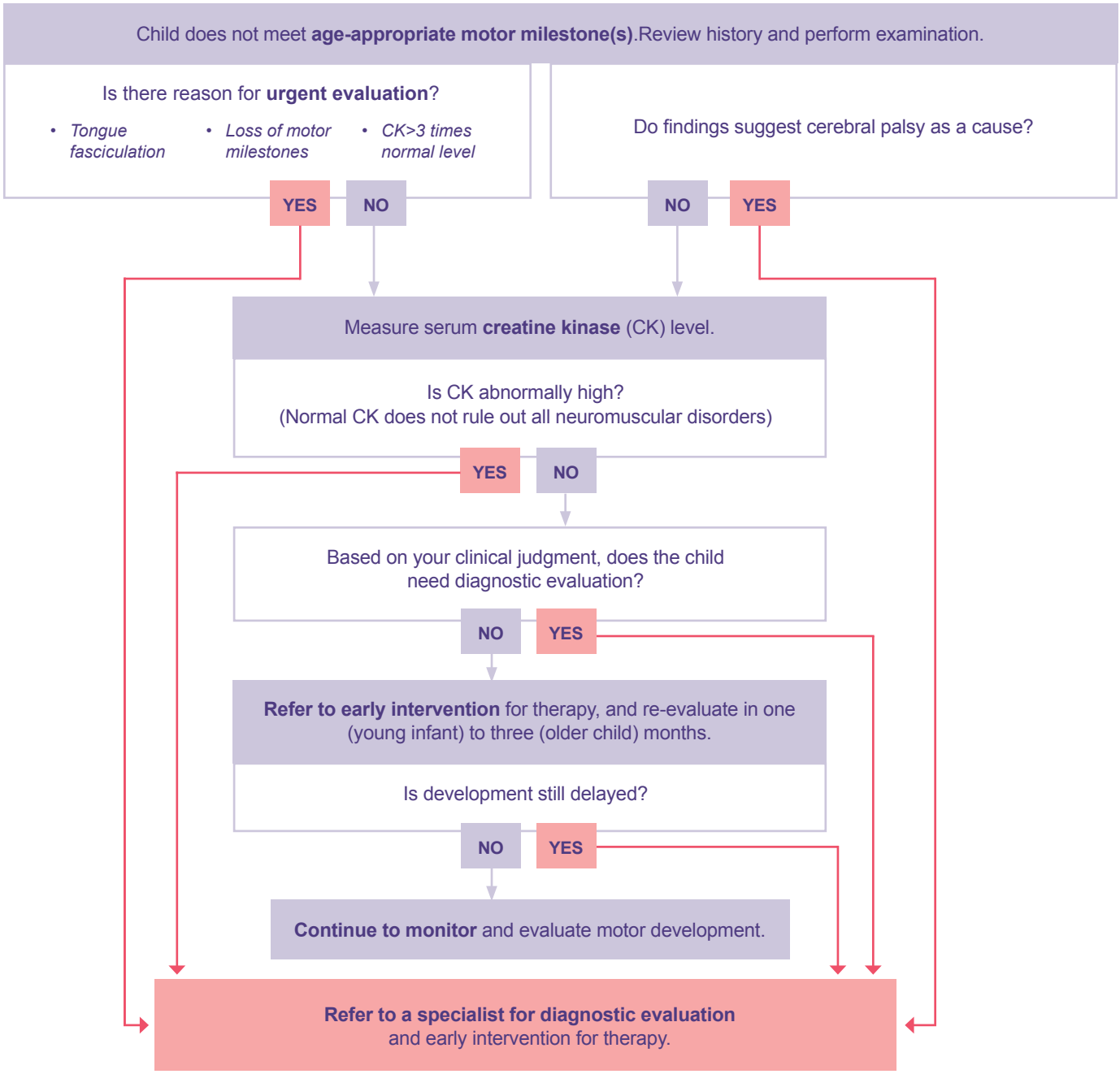
Age 4

Symptoms:
- Family first noticed abnormal gait (mild waddling while walking, toe walking)
- Family promptly informed pediatrician of symptoms

Background:
- No family history of neuromuscular disease

Initial Workup by Pediatrician:
- Pediatrician immediately recognized motor delay "red flags" and ordered CK test
- CK was 10,100
- Patient was immediately scheduled for a neurology appointment

Motor Delay Algorithm



National Task Force for Early Identification of Childhood Neuromuscular Disorders (https://childmuscleweakness.org/motor-delay-algorithm)

Supported in part by an independent educational grant from PTC Therapeutics

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Age 4 1/2

Neurology Workup:
Neurologist ordered genetic testing, which showed 22-34 exon deletion.

Treatment:
Steroid treatment (daily prednisone 0.75 mg/kg) was promptly initiated.

Patient has maintained good adherence with glucocorticoids regiment since initiation.

Side Effect:
Marked weight gain (~5 lbs) during the first 6 mos, which then stabilized.

Glucocorticoids *increase appetite, which can exacerbate* ***weight gain*** *in DMD patients who are already at increased risk for obesity. Excess weight gain is the most frequently reported side effect of steroid treatment in DMD and is the* ***most common reason for discontinuation*** *in my practice. Prior to initiation, the benefits and risks of steroid use should be discussed extensively with the patient and his family or caregiver.*

Multi-Disciplinary Care:
Patient has been adherent with multi-disciplinary care, and is routinely followed by a nutritionist and other multi-disciplinary providers.

The ***multidisciplinary care*** *model is the standard of care in DMD. The multidisciplinary team should include an endocrinologist and a nutritionist, who can appropriately manage the weight-related side effects of GCs and formulate a nutritional plan. This plan should include specific recommendations for calorie, protein, micronutrient, and fluid intake.*

Healthy eating habits should be followed by the entire family. If a patient experiences excessive weight gain after starting steroid treatment, an ***obesity management plan*** *that addresses both diet and physical activity should be put in place, and the patient should be seen by a nutritionist regularly.*

Patients with DMD Manifest Predictable Loss of Strength and Function.

Ambulatory Milestones	Gowers sign	Unable to stand from floor	Unable to sit from floor	Unable to climb stairs	Unable to stand from sitting position	Loss of independent ambulation	Unable to maintain standing position
Non-Ambulatory Milestones	Unable to reach overhead	Unable to touch scalp	Impaired ventilation during daytime (<50% FVC)	Impaired hand to mouth movement/ ability to self-feed	Unable to lift hands to table	Impaired nocturnal ventilation without support (>30% FVC)	Unable to use keyboard

Disease Progression

Age 9

Cardiovascular Prophylaxis:
Losartan initiated per treatment guidelines.

Age 14

Respiratory Symptoms:
Started cough assist at age 14.

Cardiovascular Symptoms:
Cardiomyopathy diagnosed at age 14. Carvedilol and furosemide were added as standard of care for cardiomyopathy.

Age 17

Ambulation Status:
Loss of ambulation at age 17. Currently wheelchair-dependent.

Respiratory Symptoms:
Nocturnal BiPAP for sleep apnea started at age 17.

Age 18

Musculoskeletal:
Positive for osteoporosis and scoliosis.

Currently treated with alendronate; no surgical procedures thus far.

It is important to routinely monitor for other ***side effects of long-term steroid use*** *such as behavioral problems, insulin resistance, blood sugar elevations, and osteoporosis by careful questioning, blood work, and imaging studies.*

Steroids are shown to slow disease progression in DMD. If a patient experiences ***intolerable side effects*** *on their current steroid regimen, an attempt should be made to first try a different dosing regimen by* ***modifying the dose, dosing frequency, or steroid agent*** *before the decision to discontinue steroids completely is finalized.*

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