

Sohag university
faculty of medicine
histology department

SMU 208 block

Muscle cases

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Case study (1)

- A 35 year old woman diagnosed with **myasthenia gravis (MG)**. The patient presents with fatigable weakness affecting mainly her upper limbs as well as diplopia. Due to an increased workload, the patient developed right shoulder pain, leading her to seek physiotherapy care.

- Myasthenia Gravis (MG) is a neurological condition involving dysfunction at the neuromuscular junction



Without
Myasthenia Gravis



With
Myasthenia Gravis

1. Released neurotransmitter which responsible of initiation of contraction is-----

2. The released neurotransmitter spreads from transvers tubules to sarcoplasmic reticulun through:
 - a-Desmosomes
 - b-Tight junctions
 - c-Caveoles
 - d-Nexus

- 3-Interference with activation of the neurotransmitter receptors resulting in:
- a- Skeletal muscle weakness
 - b- Skeletal muscle Hypertrophy
 - c- Skeletal muscle Hyperplasia
 - d- Skeletal muscle regeneration

4 -The neurotransmitter released at :

a-Sarcolemma

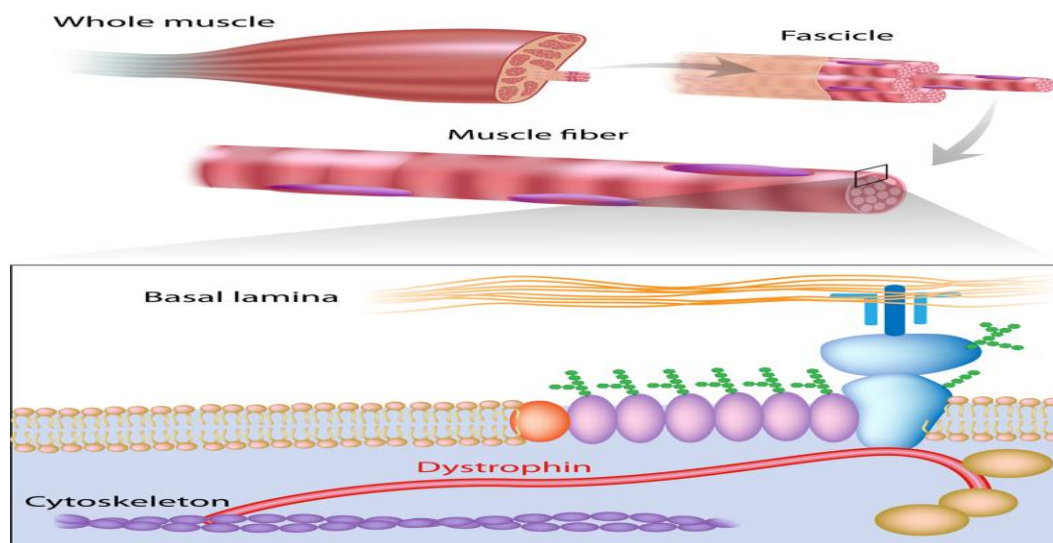
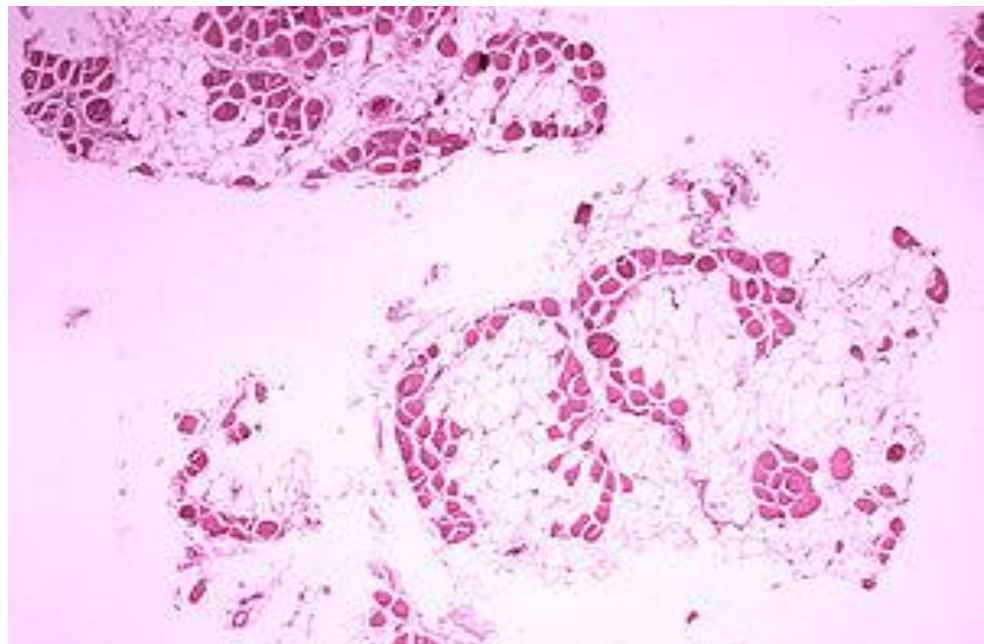
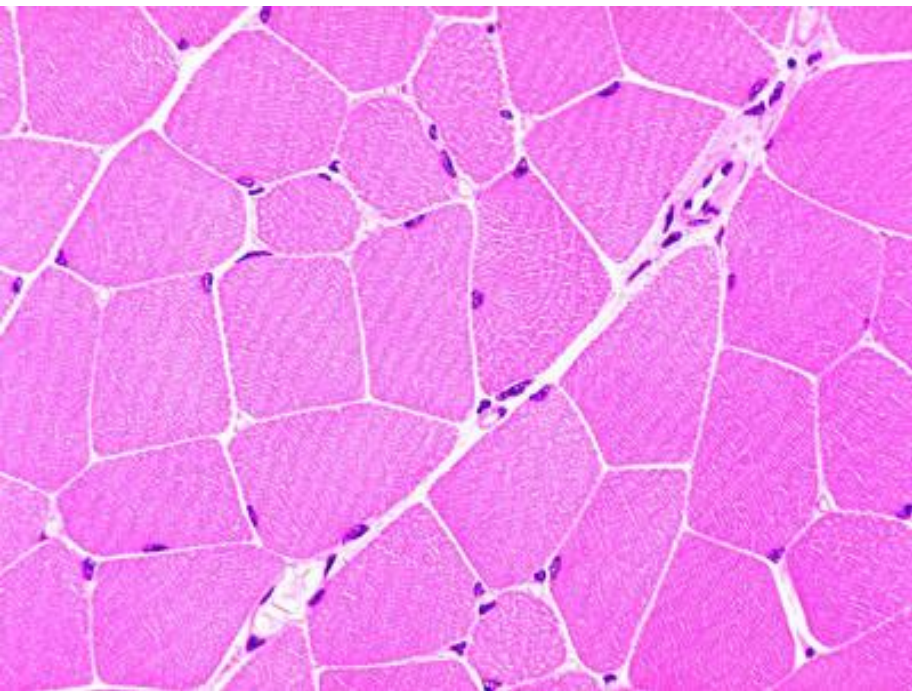
b-Sarcoplasmic reticulum

c-Sarcomere

c-Motor end plate

Case 2

- A 5-year-old male is diagnosed with **Duchenne myopathy** which is X linked disease. Mutation analysis shows large deletions in the specific protein gene .



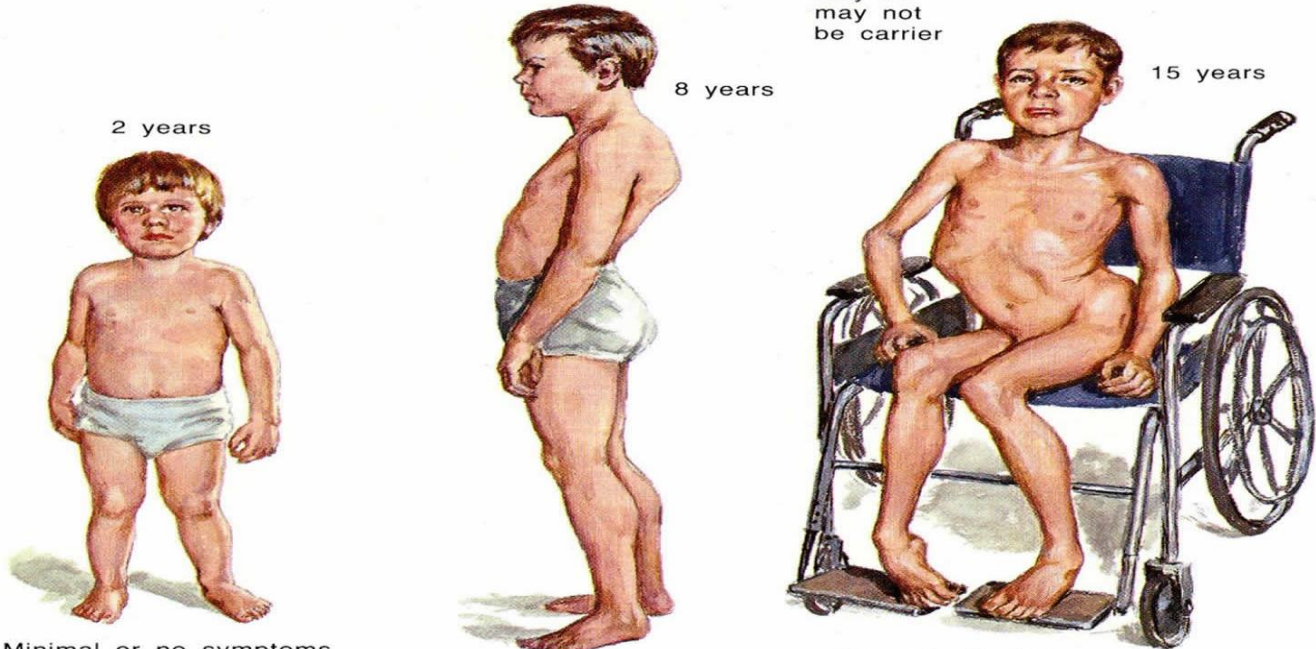
Duchenne's Muscular Dystrophy

Sex-linked recessive inheritance

Mother normal, carrier

Father normal

Only males affected, but females may be carriers



Minimal or no symptoms

Severe crippling deformities and contractures

Progression with age { Weakness, especially of pelvic girdle muscles; marked lordosis, enlarged calves



Calf muscles usually but not always enlarged



Lordosis disappears when child sits

1. Which of the following protein affected in the sarcomere?

a-Titin

b-Filamin

c-Dystrophin

d-Actinin

2. Which of the following structures are normally attached to dystrophin?

1- Actin and myosin

2- Actin and sarcoplasmic reticulum

3- Actin and Sarcolemma

4- Myosin and sarcolemma

3. Muscle weakness accompanied by irregular fewer myofibers but increased----- connective tissue:

- a- Epimysium
- b- Endomysium
- c- Perimysium
- d- Periosteal

4. The most common cause of death is:

a- Renal failure

b- Cardiac failure

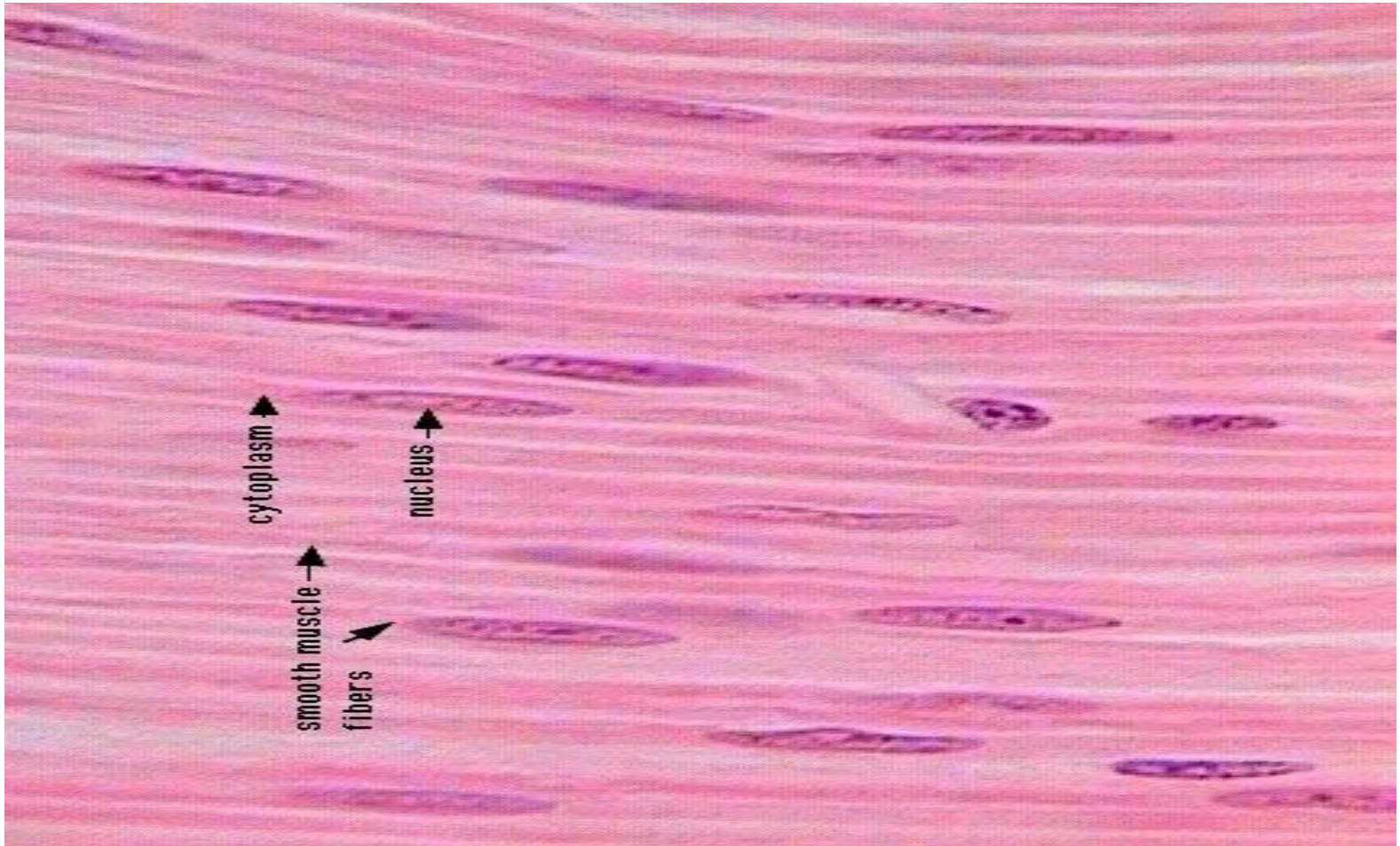
c- Respiratory failure

d- Renal failure

Case 3

- **Multisystemic smooth muscle dysfunction syndrome) MSMDs** (is a genetic disorder). It was characterized as a syndrome of congenital mydriasis , patent ductus arteriosis ,and aneurysmal arterial disease
- The disorder has variable severity, ranging from severely symptomatic and fatal in early neonatal period to a more benign and manageable course with surgical intervention .

Smooth muscle



1. In smooth muscle contraction, the majority of calcium (Ca^{2+}) needed for contraction enters the cell from the extracellular fluid.

a. True

b. False

2. Transverse) *t* (tubules are present in:

- a. Smooth muscle
- b. Skeletal muscle
- c. Cardiac muscle
- d. Both b&c
- e. Both a &c

3. Which one of the following is NOT true about smooth muscle?

- a. Both actin and myosin are found in the smooth muscle cell cytoplasm, but these are not arranged in sarcomere units
- b. The needed calcium (Ca^{2+} for contraction comes primarily from the extracellular fluid).
- c. Similar to skeletal muscle cells, smooth muscle cells are capable of only all-or-nothing twitches.
- d. Smooth muscle cell contractions are weak but sustained).
- e. Unlike the myosin molecules of skeletal muscle cells, the myosin found in smooth muscle cells is quite long, with its entire length covered with myosin head groups .