Management & Treatment of FSHD

FIELDS FSHD & Neuromuscular Research CENTER

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Fields Center Patient Day

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FIELDS FSHD & Neuromuscular Research CENTER
UNIVERSITY of ROCHESTER MEDICAL CENTER
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Management & Treatment

- Management:
  - Prevention/Treatment of complications:
    - Retinal vascular problems
    - Hearing loss
    - Breathing problems
    - Pain
  - Improving mobility & function:
    - Physical Therapy/Exercise
    - Braces and other adaptive devices
    - Surgical options

Management & Treatment

- Treatment: Slowing or stopping progression and/or improving strength
  - Improving muscle function by increasing the body's ability to repair and regenerate muscle fibers
  - Improving muscle function by reversing the effects of the underlying genetic defect.

Management

- Retinal vascular problems:
  - Rare but can result in hemorrhage into the retinal, retinal detachment and blindness.
  - Occurs mostly in early onset, severe FSHD.
  - Preventable with laser treatment if caught early.
  - Recommendation:
    - Good dilated exam to look at the retinal vessels
    - If abnormal follow up with Fluorescene angiogram
    - No need for repeated exams if initial exam is normal

Management

- Hearing Loss:
  - Occurs in about 60% of individuals with FSHD.
  - Usually minor and not noticable.
  - More severe in early infantile FSHD requiring hearing aid. Missing hearing loss in such children can lead to delayed language development.
  - Recommendation:
    - Hearing test should be done in young children diagnosed with FSHD.
    - No need for hearing test in adults unless there is noticeable problems with hearing.

Management

- Breathing problems:
  - Uncommon:
    - Less than 5% of individuals with FSHD develop breathing problems
    - Typically in severe infantile FSHD or adults in who are wheelchair bound and developing kyphoscoliosis
  - However slow loss of breathing capacity can occur and go unnoticed
  - Recommendations:
    - Get baseline lung function test when diagnosed
    - Get lung function test before surgery under general anesthesia
    - Yearly followup testing for anyone who is wheelchair bound or with severe infantile FSHD

Management

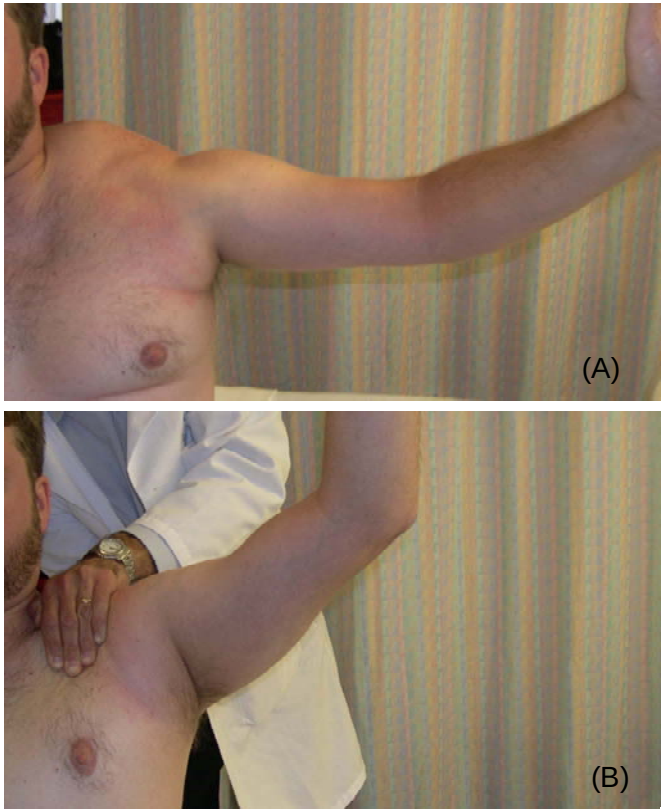
- Pain
  - Pain in FSHD occurs mostly around the shoulders, neck and lower back and hips
  - Causes: weak muscles result in lax joints and overuse stress on joints and tendons
  - Treatment should be individualized:
    - PT and stretching
    - Exercise
    - Medications: non-steroidal anti-inflammatory drugs (ie: ibuprofen) for acute pain; anti-depressants or gabapentin for chronic pain.
    - Role for surgical fixation of the scapula?

Management

- Improving Mobility & Function:
  - Physical therapy and use of Adaptive Devices:
    - Will be discussed in subsequent presentation
  - Surgical fixation of the scapula to improve shoulder range of motion.

Management

- Before considering surgical fixation:
  - Test for improvement in shoulder range of motion with manual fixation

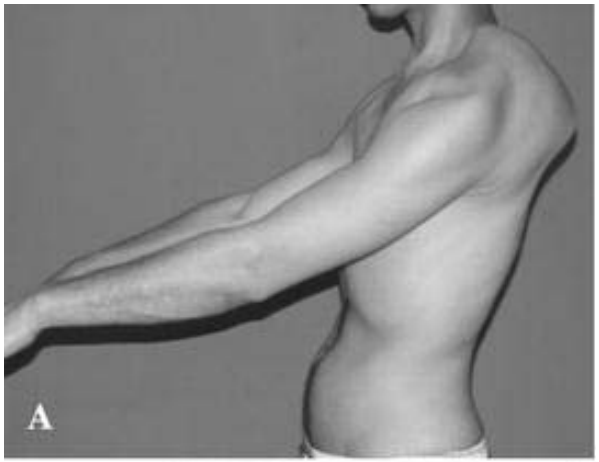


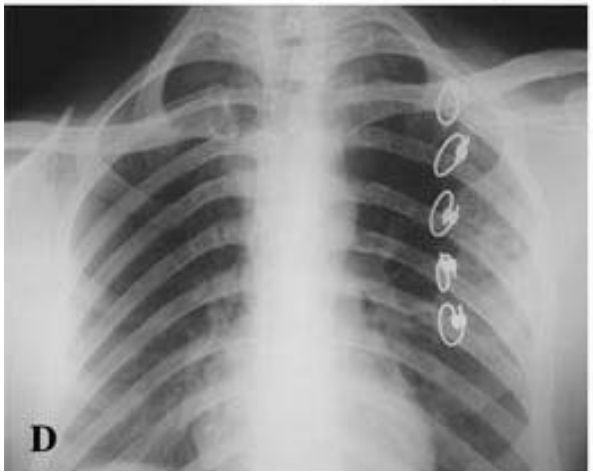
Tawil et al. M&N, 2007

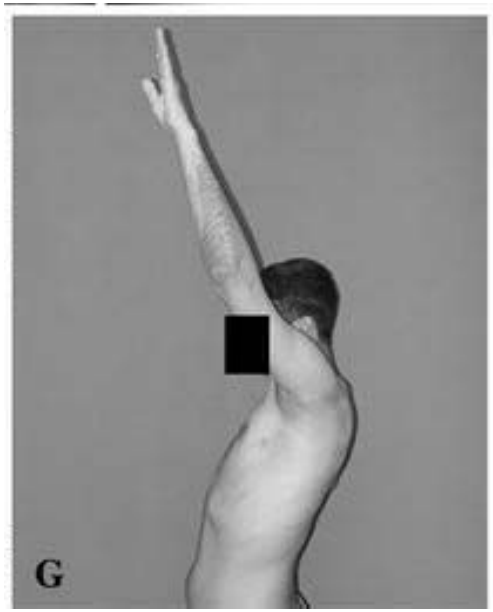
Management

- Before considering surgical scapular fixation:
  - Consider whether range of motion improves with manual fixing of the scapula
  - Consider the overall strength of the arm muscles:
    - If the biceps and triceps are very weak, the benefit from scapular fixation may be marginal
  - Consider the speed of progression of FSHD
    - Benefit may be short-lived if there is rapid loss of strength in the arms.
  - Consider risk-benefit of surgery:
    - Potential complications: non-union of bone graft, breakage of wire requiring a second surgery; prolonged immobilization of shoulder following surgery.

Management & Treatment







REF: Demirhan M et al. Clin Orthop Relat Res (2009) 467:2090-2097

Management

- Outcome of Scapular fixation:
  - Reviews indicate that most patients are happy with the outcome of surgery
- Other indications for scapular fixation in FSHD:
  - Droopy shoulder may cause pressure on the nerves of the brachial plexus leading to number and weakness in the involved arm. Fixation of the scapula to relieve the pressure on the nerves may be indicated.
  - Some patients with FSHD develop severe shoulder pain that is relieved by manually pulling back and lifting the shoulders. Such patients may also benefit from scapular fixation.

Treatment of Muscle Weakness

- Improving muscle function by increasing the body's ability to repair and regenerate muscle fibers:
  - Prednisone: effective in Duchenne dystrophy but not in FSHD
  - Albuterol: increases muscle mass but not enough to result in improved strength.
  - Diltiazem (Cardiazem): Shown not to be effective
  - Creatine dietary supplement: Evidence not clear but effect likely to be minimal.

Treatment of Muscle Weakness

- Experimental treatments: Blocking Myostatin:
  - In all tissues, there are checks and balances that turn on and off growth as needed. The on/off switches are proteins that regulate tissue growth.
  - Myostatin is a protein that turns off muscle growth.
  - Naturally occurring mutations in the myostatin gene result in unusually large and powerful muscles

New Experimental treatments

Belgian Blue Cow

New Experimental treatments

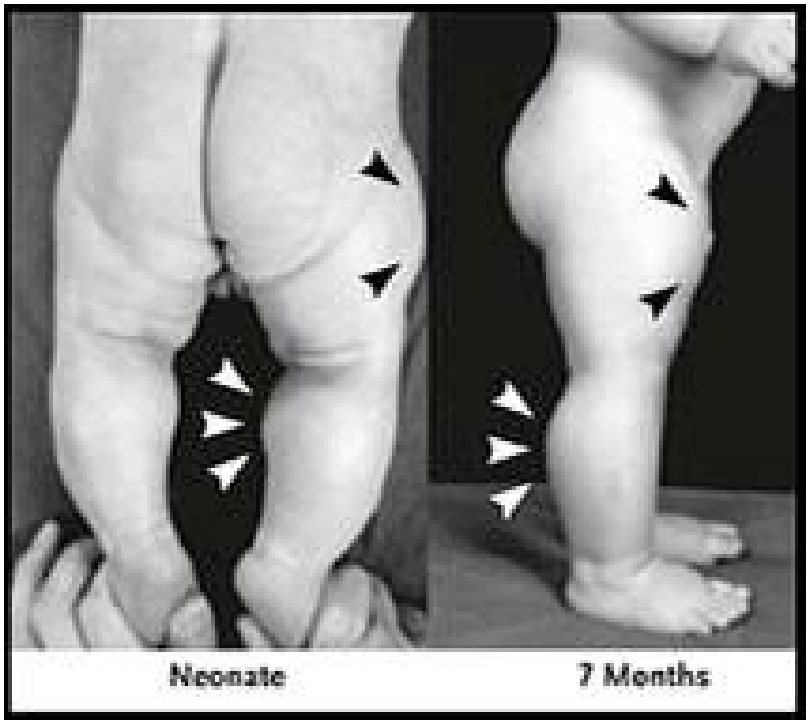
Whippets with Myostatin Mutation

No mutation	Single Mutation	Double Mutation
		
		
		

REF: Mosher DS, et al. (2007) PLoS Genet 3(5): e79. doi:10.1371/journal.pgen.0030079

New Experimental treatments

Humans with Myostatin Mutation



Schuelke M, et al. N Engl J Med. 2004 Jun 4;350(26):2682-8

Chronicle file photo/Cory Morse

New Experimental treatments

- Blocking Myostatin:
  - Wyeth developed an antibody, that blocks myostatin: MYO-029. However, it showed no benefit in patients with muscular dystrophy
  - Acceleron, a pharmaceutical company, is developing ACE-31, a protein that block the effects of Myostatin but also other inhibitors of muscle growth.

New Experimental treatments

- Blocking Myostatin:
  - Experiments with ACE-31 show that it is more powerful that MYO-029.
  - Clinical trials are in the planning stages.

Treatment of Muscle Weakness

- Improving muscle function by reversing the effects of the underlying genetic defect in FSHD.
  - Recent advances in our knowledge about the underlying defect in muscle cells caused by the defective DNA on chromosome 4 makes it possible, for the first time, to start thinking about specific, targeted treatments for FSHD

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