

Ronnie Coleman and his Mysterious Left Lat Atrophy

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First off, it's important to understand that the human body is not normally a symmetrical structure. One arm might be longer or bigger than the other, a calf may be shaped differently, or an areola may point one way or the other. The fact is, if you talk to a plastic surgeon, making the body perfectly symmetrical may make it look odd. On the flip side, bodybuilding focuses on perfect symmetry and any asymmetries that do exist usually create problems; especially in the pro-ranks.

Ronnie Coleman won the Mr. Olympia 8 times for a reason. He's always been freakishly huge, ripped, and **SYMMETRICAL!** However, this year, many fans noticed something disproportionate on Ronnie. His left latissimus dorsi muscle, his "lat", appeared smaller compared to the right. Some fans also noted, although less dramatic, that Ronnie's left tricep was also atrophied.

I'm quite sure that only a few close friends and his doctor really know what's going on; however, as an orthopaedic surgeon, bodybuilder, and bodybuilding fan, I was very intrigued by the asymmetry that Ronnie displayed. In this article, I intend to speculate on what might be going on with the ailing 8-time Mr. Olympia. I will describe the anatomy of the latissimus dorsi muscle and I will define what's meant by "muscle atrophy". Finally, I'll develop a fictitious history and physical exam with signs and symptoms that might potentially explain Mr. Coleman's problem. My portrayal of the 8-time Mr. Olympia Champ's history and physical exam is entirely made up for entertainment and educational purposes. I'll finish by sharing my differential diagnosis and treatment plan.

The Latissimus Dorsi Muscle:

The lat is a large muscle with a broad aponeurosis that originates on the spinous processes of the lower six thoracic and all of the lumbar vertebrae, the posterior crest of the ilium, the posterior sacrum, the lower 3-4 ribs, and as an attachment to the tip of the scapula. The lat then becomes a flat tendon that twists upon itself to insert into the inter-tubercular groove of the humerus; between the pectoralis and teres major tendons ("the lady between two majors"). The lat acts to extend, adduct, and internally rotate the arm. It also pulls the inferior angle of the scapula inferior and medial thus drawing the shoulder downward and backward.

The Latissimus muscle is innervated by the Thoracodorsal nerve from the posterior cord of the brachial plexus and derives it roots from C6, C7, and C8.

The lat muscle is stimulated by performing lat pull-downs, chin-ups, seated rows, dumbbell rows, standing straight bar rows, and many other exercises. In bodybuilding, the latissimus muscle is a major contributor to the elusive "V" symmetry in bodybuilding; therefore, when asymmetry is present, it's usually very noticeable. Luckily, this muscle is rarely injured. In fact, tendon tears that require surgical intervention are almost non-existent.

Muscle Atrophy:

All bodybuilders strive for muscle hypertrophy-- making the muscle larger either by producing more contractile proteins or by fusion of growing myoblasts. The opposite of this process, where the muscle gets smaller, is called muscle atrophy. Muscle atrophy can have many causes-- injured limbs that are not in use, tendon tears and pain (tendinitis), or tendon ruptures that result in a failure of the muscle to lengthen and thus experience tension. Remember, muscle stretch and tension are critical for stimulating muscle hypertrophy. Tendinitis or muscle strains cause pain that limits the use of that muscle and thus decreases the amount of weight that can be used. In bodybuilders, decreasing the heavy poundage stimulus can result in atrophy of that particular muscle group. Similarly, arthritis in a joint where a particular tendon crosses can result in atrophy of the muscle belonging to the tendon. This is due to the lack of range-of-motion and stretch of the muscle, and limited use of the extremity due to pain. Since the lat crosses the shoulder joint, shoulder arthritis can severely limit the ability to perform lat-stimulating exercises.

Besides stretch and tension, a muscle needs constant stimulation by nerve endings. Clearly, cutting or damaging a nerve can result in dysfunction, weakness, or paralysis of a muscle. Stab injuries or direct trauma to a nerve may result in profound muscle atrophy that is potentially irreversible unless the nerve is repaired. Furthermore, compression of a nerve can result in nerve dysfunction. This compression can occur anywhere from the nerve's origin to its motor endplate on the muscle.

Peripheral nerves, such as the thoracodorsal nerve (that innervates the lat), originate in the spinal cord. Roots arise from the spinal cord and leave through foramina, or openings, between the vertebral bodies. Bone spurs from degenerative arthritis and herniated intervertebral disks may compress nerves at the root level. This compression can manifest as pain and/or muscle weakness and atrophy. Muscle atrophy is a sign of fairly severe and chronic nerve compression.

Nerves can also be compressed by cysts or masses. For example, a large ganglion cyst or synovial cyst can form when fluid around tendons or joints escapes into their surrounding linings resulting in a balloon or outpouching of those linings. Masses come in many forms-- benign fatty tumors (or lipomas), abscesses (an infected or sterile fluid collection from an injection), or even cancer.

Nerves can also be compressed by hypertrophic surrounding tissues such as muscle! There are many described syndromes relating to nerve impingements as they pass through or between muscles. With regard to Ronnie Coleman, every muscle lying adjacent to the thoracodorsal nerve is excessively hypertrophied!

Other causes of muscle atrophy include systemic disorders and metabolic disturbances; however, these types of problems usually result in global (not local) muscle weakness and atrophy. There are rare diseases that result in atrophy

of individual muscle groups (various muscular dystrophies, immunological disorders, and rheumatologic diseases that attack muscle cells or block their nerve stimulus); however, the chance that Ronnie Coleman has one of these conditions is very slim.

The Fictitious History and Physical:

The patient is a 44y/o massive bodybuilder who presents with new onset atrophy in his left Latissimus Dorsi muscle. The patient recognized the problem as he began preparing for his bodybuilding contest a few months ago. He has recognized an asymmetry in his left lat ever since he leaned out for his contest. He seems to think the atrophy is slowly progressive. He also noticed difficulty lifting extraordinarily heavy weights in rowing and chinning movements. The patient has tried NSAIDs, massage therapy, physical therapy, acupuncture, and chiropractic care without relief. The patient denies having any pain in his neck, back, shoulder, or left upper extremity; although, he does admit to having very high pain tolerance. The patient denies any numbness or paresthesias (symptoms of nerve compression), bowel or bladder symptoms (symptomatic spinal stenosis with cord compression), and any fevers, chills, night sweats, unexplained weight loss, or other constitutional symptoms (signs and symptoms of systemic illness or cancer).

Past Medical History: Denies any medical problems

Past Surgical History: Bursectomy elbow.

Medications: denies taking any medications

Allergies: No known drug allergies

[Allergic to weakness and losing contests-"results in large bumps forming all over his body"]

Family History: Noncontributory.

Social History: Retired police officer and professional bodybuilder, denies tobacco use, occasionally drinks alcohol, and denies recreational drugs and anabolic steroid use.

Review of Systems: Patient denies any other constitutional complaints, bowel, bladder, liver, endocrine, neurological, musculoskeletal, renal, pulmonary, or skin complaint at this time.

Focused Physical Exam:

General: Patient is a 42y/o, 5'11", 315lb massive bodybuilder in no acute distress. He's alert and oriented. Patient appears his stated age.

Left upper extremity:

Inspection and palpation: Noticeable atrophy of the left latissimus dorsi muscle in comparison to the right. Mild left triceps atrophy compared to the right. No palpable masses around left shoulder. No tenderness to palpation of cervical spine,

trapezius or latissimus. No palpable muscle defects. Tendons appear intact. Skin is intact without rashes, erythema or fluctuance. Compartments are soft.

Range of motion: Full to shoulder forward flexion and abduction, elbow flexion and extension, forearm supination and pronation, wrist flexion and extension and digital motion. No crepitus or pain with passive or active motion of those joints. Full cervical spine range of motion, with mild pain in left arm with neck extension.

Motor: 5/5 strength to shoulder abduction, elbow flexion, wrist extension, hand intrinsics, EPL and FPL. 4/5 strength to shoulder extension, elbow extension, and wrist flexion.

Neurologic: Light touch sensation C5,6,8 and T1 intact. Diminished subjective sensation in the C7 dermatome; middle finger. No long-tract signs-clonus, hoffmans, babinski (no spinal stenosis), globally diminished reflexes (often hard to get bodybuilders to relax). Negative Roos Test (no thoracic outlet syndrome). Normal rectal tone per the eager intern.

Vascular: 2+ radial pulses equal bilaterally with regular rate, brisk refill in all digits.

Assessment:

This is a 42y/o male bodybuilder with left latissimus dorsi and triceps atrophy and weakness.

Differential diagnosis:

- 1) Cervical Spine Degeneration and Foraminal Stenosis. Because of the patient's age and history of heavy weight-lifting the most likely diagnosis here is degeneration of his cervical spine. This may be a result of degenerative bulging or herniated intervertebral disks or facet hypertrophy with bony spurring causing compression of the exiting nerve root at the level of the C7 nerve root. This could result in latissimus and triceps atrophy.
- 2) Partial Latissimus Tendon tear: Although his tendon feels intact and he does have a functional lat, he may still have a partial tear of the tendon. Mr. Coleman has high pain tolerance and is quite stoic; thus his pain may not have been elicited on physical exam.
- 3) Peripheral Thoracodorsal Nerve Impingement: This diagnosis is less likely, especially if the triceps atrophy and weakness is a real issue. This could be a result of muscular impingement or a mass effect. If he ever had any site injections in the region of this nerve there may be a sterile abscess. No lipomatous masses appreciated on palpation.
- 4) Thoracodorsal Nerve Injury: This would be possible with a misplaced site injection.
- 5) Left shoulder and elbow arthritis, bursitis, tendinitis: less likely diagnoses without any loss of range of motion, crepitus, or pain to palpation/with motion
- 6) Cancer, systemic illnesses, and myositis: Even less likely with lack of consistent history and constitutional symptoms. [When you hear hoofbeats in Texas, don't look for Zebras.]

Plan:

The plan for Ronnie Coleman is to continue competing in the Mr. Olympia contest in 2007. In light of this, we need to find and address the source of his lat atrophy. Mr. Coleman has already failed conservative measures of physical therapy, chiropractic care, massage therapy, acupuncture, and rest. I speculate he doesn't rest like the average person. The lat atrophy should first be assessed by obtaining cervical spine radiographs and an MRI. The x-rays will allow assessment of cervical spine alignment, degeneration, disk spaces, foramina, and stenosis. The MRI will better evaluate the spinal canal, intervertebral discs, and foramina. Cord compression would also be noted. Nerve conduction studies may also be

warranted down the road. An MRI of the shoulder or brachial plexus would be reserved for a negative cervical spine workup.

Only Big Ron and his doctors can confirm any of this. I don't blame him for keeping this private. He's playing the game like a champion; never letting down his guard and keeping a positive outlook. I bet the champ will overcome this and return to the Olympia stage as promised. I wish him the best in the upcoming year. There are a lot of young pros out there who are ready to take the Olympia race away from Big Ron and Jay; however, I'll leave the Olympia predictions to Flex Wheeler!

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