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-Rick Newcombe, Creators Syndicate...

SHOULDER PAIN?

The Solution & Prevention

Fourth Edition The Kauai Study

With New Content from :

Rick Newcombe, Creators Syndicate

Roleigh Martin M.A., Researcher

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SHOULDER PAIN?

THE SOLUTION & PREVENTION

FOURTH EDITION

Revised & Expanded

BY

JOHN M. KIRSCH, M.D.



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“Let us affirm what seems to be the truth...”

– Plato, *“The Republic”*, Bk VIII

*“Science is about defining truths about nature, through
experiment, or; experience.”*

– Richard Feynman (nuclear physicist,
author, artist and bongo drum musician)

**The exercises in this book are simple.
The book is not.**

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With gratitude to my wife Joy for her encouragement and belief in the importance of this book, and to the CT technologists of the Beaver Dam Community Hospital, Beaver Dam, Wisconsin, who taught and guided my studies of the CT scans made for this book.

And to Rick Newcombe, (www.Creators.com) whose story of struggle and success in restoring the health of his shoulder in the summer of 2011 has contributed so much to validate the Kirsch Institute exercise protocol.

And to Roleigh Martin, M.A. who has provided so much help gathering information on alternative equipment and methods for hanging.

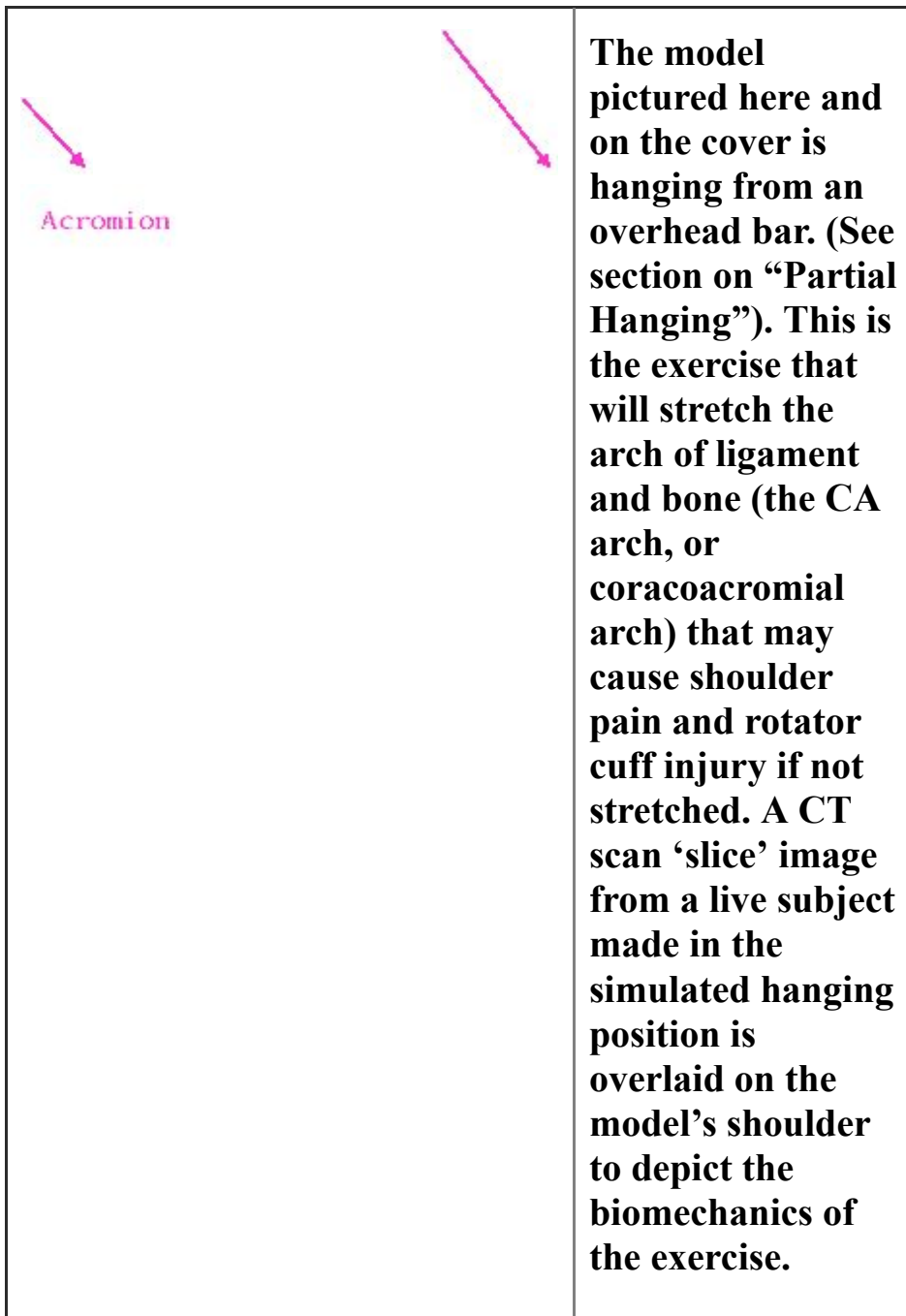
And to Matthew Brown, journalist, who so perfectly captured the essence of this book in one single newspaper article in the Portage County Gazette (Wisconsin).

And to Tom Honl DDS who has clarified the link between shoulder pain, sleep apnea and sleep position.

And to all who have validated the Kirsch Institute's exercise protocol by restoring the health of their own shoulders.

Foreword

This is the book that will teach you a new exercise that will remodel your shoulders to prevent pinching and tearing the rotator cuff, relieve stiffness and pain and restore normal flexibility. Along with simple weight lifting, the exercise will heal and maintain the health of your shoulders.



Humerus



In this figure, notice how the humerus is positioned to lean against the acromion part of the scapula in the hanging position.

Prologue

This Fourth edition of the book “*Shoulder Pain? The Solution & Prevention*”. contains the first formal academic study of the Kirsch Institute Protocol that I presented this past March 22-25, 2012 at the 1st Combined Australian/American meeting of the respective hand & upper extremity surgery societies in Kauai HI. There are fewer testimonials and book reviews in this new edition, but those previously printed are still available at: these websites:

www.amazon.com

www.kirschshoulder.com

For the purpose of understanding why the hanging exercise is so effective, I made CT scans of the shoulder of live subjects, some in the simulated hanging position as well as others in various degrees of arm elevation. These studies present the live shoulder anatomy in 3D video. The videos captured the shoulder both in skeletal and soft tissue formats. The CT scan format allows a far more accurate study of the living body than cadaver studies, as the anatomy remains intact and is indeed, “live.” Study of these 3D videos will greatly enhance your understanding of shoulder anatomy and the dynamics of the hanging exercise. I have made these videos and many more still images of the shoulder also available on the website www.kirschshoulder.com I strongly recommend that you study the website for the science, testimonials, FAQ’s, and information about equipment available to assist with the hanging exercise.

This Fourth Edition has Three Aspects:

1. **FACT:** Hanging from a bar and light weight lifting

relieves most shoulder pain problems.

2. **THE EXERCISE PROTOCOL:** Hanging from an overhead bar and lifting light weights.

3. **THEORY:** My theory as to why the exercise protocol works to relieve shoulder pain. This section is optional reading, as it is **just my theory** as to why the hanging & weight lifting exercises are so successful in relieving shoulder pain.

These aspects are not strict divisions within the book, but are a general outline of the content. There is a necessary flow of information from one section to the other.

The Fact & the Study

FACT: The Protocol Works

In March 2012 I presented the first formal academic study of the Kirsch Institute exercise protocol at the 1st Combined Australian/American meeting of the respective hand & upper extremity societies on the island of Kauai HI.

The study included 92 carefully followed subjects with shoulder pain problems who used the Kirsch Institute for Shoulder Research exercise protocol to overcome their shoulder pain.

The majority of these subjects had been suffering with shoulder pain for many years and had tried many other methods of treatment at great expense with no relief. Most of these subjects were scheduled for, or advised to have shoulder surgery.

The Kauai Study

The subjects in the study had the following diagnoses:

- SIS (subacromial impingement syndrome):
70
- RC (rotator cuff) tears with MRI diagnosis:
16
- Adhesive capsulitis (Frozen Shoulder): 4
- Osteoarthritis of the glenohumeral (GH)
joint with severe SIS: 2

Of these 92 subjects, 90 were returned to comfortable ADL (activities of daily living) and remain so after variable years of follow-up (1–28 years). Two subjects with “shoulder pain” had been scheduled to have shoulder replacement surgery and were able to cancel that surgery. Two subjects quit the study for personal reasons.

One person, a 70-year-old woman with osteoarthritis of the GH joint, deserves special mention: *This subject was scheduled for a total shoulder replacement (euphemistically referred to as “resurfacing”). I was asked to evaluate her two weeks before the scheduled surgery. I did a complete shoulder exam and reviewed her pre-op shoulder x-ray that is shown below:*



*Indeed, this subject had osteoarthritis of the GH joint. But, the cause of her pain was severe SIS and weakness of the RC tendons and muscle. The GH joint arthritis was not the cause of her pain. She began hanging and weight lifting, cancelled her shoulder replacement surgery and one year later was completely pain free and returned to cross-country skiing. She has continued to improve since then and can again shift a standard transmission car five years after having had to stop. She observed, **“Little things mean a lot, but not having surgery is a big thing.”***

That this patient responded to the hanging exercise in spite of the presence of osteoarthritis of the GH joint presents a new challenge for those surgeons who perform total shoulder replacement surgery.

It is my sincere hope that all therapists who treat patients with shoulder pain caused by the SIS, RC tears, the frozen shoulder and osteoarthritis of the GH joint employ the hanging & weight lifting protocol outlined in this book.

Testimonials

*“My name is Dale Schroeder, I was having a lot of pain in my right shoulder. The pain was so bad I couldn’t pull my compound bow back. I decided to go to an orthopedic Dr. They did an MRI and the results were a torn rotator cuff. They said I needed surgery as soon as possible. It was my busy season so I was going to have to put it off until Sept. or Oct. I believe this was May 2006. Sometime during the next month or two I ran into Dr. Kirsch at the fishing dock. As we were talking, I told him about my shoulder problem, he said he didn’t think I needed surgery. He told me I should put up a bar in my basement and hang from it as long as I could, **he said it would hurt and it did.** He said after that I should get two five pound weights and lift them from the side of my body up over my head. In a matter of a few days my shoulder was feeling better. It wasn’t very long and the pain was gone and still is. I can pull my compound bow again and have no pain in my shoulder. As I am writing this it’s bow season 2009. I have told a lot of people about Dr. Kirsch’s method. In my experience Dr. Kirsch’s cure was a lot better than the alternative. Thanks Dr. Kirsch,”*

— Dale F. Schroeder, Two Rivers, WI

(Author’s note: The above testimonial will forever remain in this book as Dale’s testimonial was the “tipping point” that pushed me to write this book for the public.)

“Dear Dr. Kirsch, I would like to share with you my positive experience with hanging. I am a 70 year old woman. I have always been an athlete and expect my shoulder problem may be associated with decades of tennis, downhill and cross-country skiing. I have no pain in my left shoulder. But over the past 5 years I have had progressively greater pain in my right shoulder, to the point I was taking non-steroidal anti-inflammatory pain pills, for example, before

cross-country skiing. I was scheduled for resurfacing surgery in January 2011. Instead, I started hanging and lifting 1 pound weights and was able to decrease pain medicine and stopped it altogether by summer! I cross-country skied a lot over the Holidays just passed and never needed any pain medicine. While traveling last year I missed some days hanging, but have now found ways to hang most places most of the time and look forward to longer hangs and heavier weights. Thank you for your help.”

Sincerely,

— Older and wiser and healing

Those who have made the effort to use the hanging exercise have usually been rewarded with prompt relief. They also share a common appreciation for the exercise:

“Gravity is Free!”

Or is gravity really free? No. Gravity is a “*blessing and a curse.*” Our anatomy is subject to the force of gravity our entire lives. It pulls us downward, keeping us nicely planted on the earth; but at the same time applies destructive forces to our hips, knees and spinal elements...and our shoulders. There is not much we can do to escape this force. We can minimize the damage to our hips and knees by maintaining ideal body weight, but to overcome the damage to our shoulders we have another alternative: hanging from an overhead support! When we hang, simulating part of the brachiating exercise, we reverse the destructive force of gravity on the shoulder. As we shall see in the pages that follow, many elements of the shoulder are stretched to their limit while hanging...a normal human activity...and for those moments when we hang, we have defeated the destructive force of gravity on our shoulders.

The Shoulder Research Institute

The Kirsch Institute for Shoulder Research was established in 2010 to assist those with shoulder pain to work through their problems by explaining the Kirsch Institute exercise protocol. The Institute's open-line discussion is available at: kirschinstitute@gmail.com

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PART 1

INTRODUCTION

Why This Book?

This book is written to provide a new exercise program that will restore and maintain the health of your shoulders. People often ask me why I went out on a limb to write this book for the public.

The writing and publication of this book is a moral obligation. When I graduated from medical school, I, as my peers, took the Hippocratic Oath, which states in part:

“To consider dear to me, as my parents, him who taught me this art; to live in common with him and, if necessary, to share my goods with him; To look upon his children as my own brothers, to teach them this art; and that by my teaching, I will impart a knowledge of this art to my own sons, and to my teacher’s sons, and to disciples bound by an indenture and oath according to the medical laws, and no other. I will prescribe regimens for the good of my patients according to my ability and my judgment and never do harm to anyone.”

Many also ask why, instead of publishing the information in a scientific journal, I wrote this book for the public. If I had done the former, the information in this book would molder in libraries for many years instead of reaching the people who need it **now**...those with shoulder pain.

My Story: Solving the Enigma of the Shoulder

In the late 1970's, I was performing many knee arthroscopies in my orthopedic practice. In those years we did not have the luxury of small video adapters and we were required to sit at the foot of the table looking through an arthroscope holding the 'scope up with the arms elevated for long hours. By the early 1980's I had developed severe impingement pain in both shoulders and puzzled over what to do: then I stumbled upon an idea that changed my life.

I was hiking in Peninsula State Park in Door County, WI, with my two young boys when we came upon a horizontal ladder. The boys climbed to the ladder and swung across like little monkeys. Then it was my turn. As I reached for the second rung of that ladder, I realized I would never reach it; and I sensed immediately that the reason I could not “do” the ladder was because I had not been **doing it!** *I was not hanging, or brachiating. If you want to be able to do something, you must do it. If you want to run a marathon, you must run & run & run. The same is true of the human shoulder. If you want to be able to use your arm for overhead activity, you must use the arm for overhead activity! You must use the shoulder for what it was designed to do: brachiate! Or, at least simulate brachiating, by hanging from a bar and doing light weight lifting.* I also sensed that the hanging involved with this brachiating maneuver might be the solution to mid-life shoulder pain. Being an orthopedic surgeon with knowledge of the anatomy

helped with this insight. I reasoned that if I could reshape and strengthen my shoulder anatomy by hanging, I might be able to avoid surgery.

I installed a bar from some ceiling beams and began hanging as long as I could. At first I could only hang for a few seconds, but as time went on, I was able to hang for longer and longer periods. Even after a few days, my shoulders began feeling better. At the beginning of each daily session, the first effort to hang was painful. But 15-30 seconds into the exercise, I noticed that the pain had stopped. When I returned to the bar each repetition became easier and easier.

Then I began lifting 5 lb dumbbells to strengthen the RC tendons and muscles. At first this was painful and I could only lift a 5 lb dumbbell about 20 times. After a week or two I had much less pain and after about 3 months my shoulder pain was gone and I could lift an 8 lb dumbbell doing 50 repetitions in each of three directions.

Fast forward to the present: I am now 74 years old. Four years ago I was bowled over by two large dogs and suffered a complete tear of my rotator cuff. The supraspinatus tendon was completely torn and the muscle retracted. I could not lift my arm. But...after some weeks I began the painful process of hanging from my overhead bar and trying to lift light weights. This exercise was accompanied by painful crunching and grinding in the shoulder. At first I could barely elevate the arm to the horizon. Then I attached some elastic bands to the ceiling and used them to pull my arm up after I pulled the bands down. Then I gradually began “helping” the elastic bands lift my arm. This gradually strengthened my arm and after these four years of hanging and weight lifting I can

now lift a 10 pound weight 150 times to a full overhead position each day. I have no pain in either shoulder. I can play tennis with a hard serve, throw anything, pull my 60 lb archery bow, dig ditches, throw dirt from my shovel.....well, you get the idea. I have no supraspinatus tendon or muscle, yet I am able to use my injured shoulder just as if it had never been injured.

I believe this story of my recovery is best explained by the redundancy built into the human body that can substitute for the lost function of the injured parts. Nature provides us with backups.

Back to the past: Having had this personal success with the exercises, I began incorporating them into my practice. These exercises have helped many people avoid shoulder surgery. For the past 28 years I have continued to research the effect of these exercises on the shoulder and have decided to share this information here.

The cost of medical care in the United States is astounding. *In 2008 the annual direct and indirect costs of bone and joint health in the U.S. were \$849 billion. More recent surveys show even higher dollar figures. Musculoskeletal disorders are the leading cause of disability in this country. Of these conditions, shoulder pain is the third most common disorder.*

This book describes the exercises that I used to heal my own shoulders. They relieve most shoulder pain quickly, sometimes in days or several weeks. These exercises involve simply **hanging from an overhead support such as an**

exercise bar or pipe and lifting dumbbell weights. It is that simple.

This book is not intended to be an academic discourse. Even as it is primarily written for the public; my hope is that those healthcare workers treating persons with shoulder pain receive and understand the information in this book. There are a few references to the orthopedic and other scientific literature, but I have kept these to a minimum. I hope that interested readers use the internet for further study. There is no other text that puts forward a hanging exercise to overcome the degenerative changes of the shoulder caused by time, gravity and disuse. You will also find that many of the ideas and some of the images are repeated in different sections. This is deliberate.

My hope is that these repetitions will emphasize the importance of the various ideas.

The anatomy of the shoulder is complex and the medical terminology difficult for the average person. For this reason I have simplified the wording wherever possible.

The usual professional recommendations for relieving shoulder pain are rest, ice, anti-inflammatory drugs, various exercises considered safe because they do not increase the pain. When you seek care with your doctor for shoulder pain, he will usually make a diagnosis, order medication and refer you to a physical therapist. The physical therapist will initiate and supervise various treatments or what are called “modalities” such as the use of heat, vibration, or electric current applied to the shoulder area. They may apply cortisone to the skin, do massage or stretch your shoulder.

Some “safe” stretching exercises will be ordered, but usually you will be advised to avoid pain while doing these exercise routines. Strengthening exercises will be ordered, but limited to weight lifting without raising your arm above the level that causes pain.

After 2-3 weeks, you might be referred back to your doctor who will then order scans of your shoulder (usually expensive MRI studies) and then may recommend more physical therapy, cortisone shots or surgery. What I just described is the usual available treatment for the shoulder. While some of these treatments are helpful, they usually require repeated visits to the therapist or physician and all too often do not solve the shoulder problem. Going through this medical routine is expensive and for many with shoulder pain unnecessary.

Why a hanging exercise has not been previously recommended in standard shoulder treatment programs is understandable. To my knowledge, there has been no research conducted on a hanging exercise other than the study upon which this book is based.

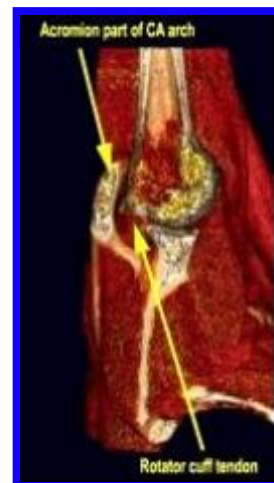
Surgeons will perform an expensive operation that removes about 5–8mm of bone from the shoulder to make more room for the rotator cuff. This surgery also removes important tissues from the acromiohumeral joint (see section on “The forgotten joint). The hanging exercise will provide the same increase in “roomy-ness” by remodeling or reshaping the shoulder bones and ligaments and by restoring the normal flexibility to these structures.

Judging from comments on the hanging exercise by therapists and physicians, it seems to be the common thought that you will injure the rotator cuff when you perform the hanging exercise. The CT scan images on page 9 should make it clear that the rotator cuff is safe during the hanging exercise. In fact, in the hanging position, the rotator cuff muscles are totally relaxed and in what one expert, A.E. Codman [1], termed “the position of rest.” Codman was not referring to the hanging position, but what he called “the hammock” position that a person assumes when they clasp their hands over and behind their head as when relaxing in a chair. This position is similar to the hanging position as far as the rotator cuff muscles are not active, but totally relaxed and far behind the bone and ligament of the coracoacromial arch (CA arch). The CA arch will be discussed in detail in a later section of the book.

It is clear from more than 28 years of clinical research on the hanging exercise that it is not only safe, but extremely effective in relieving and preventing the most common causes of shoulder pain. Until I discovered the hanging exercise in 1983, I followed the usual physical-therapy-followed-by-surgery routine in my practice. Up until then, I had no alternative treatment options. After 1983, I became far more conservative and performed far fewer surgeries for the shoulder. Many of those treated with the hanging exercise had relief from their pain within days of beginning the hanging exercise.

There is a fear in the therapy community that hanging will pinch the RC and cause damage to this structure. The

images on the next page should make it clear that this is not the case.



Figs. 1 & 2 Here one can see the rotator cuff tendon and muscles in their “position of rest” These images taken from a CT scan (computer assisted tomographic, or “CAT scan”) of a normal live subject simulating the hanging position without editing. The image on the right was made with a CT setting to show soft tissue. Note the position of the rotator cuff tendon (long yellow arrow). The tendon and its insertion are well behind the acromion bone of the CA arch that could pinch or injure the tendon. This position of the rotator cuff tendon makes it impossible to injure this tendon during the hanging exercise.



Fig. 3 This series of images demonstrates the joint between the humerus and the acromion and the **artist’s rendering** of the soft tissues between these two bony parts of the shoulder. These soft tissues include the coracoacromial ligament (white arrow) as it inserts on the undersurface of the acromion, the subacromial bursa (yellow arrow), and the rotator cuff tendon and muscles (red arrow). Note the safe positioning of the rotator cuff tendon insertion.

Rick Newcombe's Story: Struggle and Success in Overcoming Shoulder Pain

“A MIRACLE THAT CHANGED MY LIFE”

By Rick Newcombe

After years of lifting weights, you can expect shoulder pain. It goes with the territory.

I say this as a 62-year-old man who has been lifting weights his entire life — and as one who has seen countless others in the gym either quit working out altogether or succumb to shoulder surgery. Just last year, there was a famous photo on the Internet showing Arnold Schwarzenegger and Sylvester Stallone sharing a hospital room during their recoveries from the shoulder surgeries they had undergone.

Mr. Olympia Frank Zane writes about having shoulder replacement surgery. Mr. Universe Dave Draper tells of his commitment to training after his shoulder surgery. There are countless others.

For many years, I worked out at World Gym in Santa Monica, California, and saw all of these bodybuilders and hundreds, perhaps thousands, of other bodybuilders and weight lifters come and go. I can't tell you the number of times people told me that they would have to take a layoff for a while because they were going to have shoulder surgery.

“My doctor says I have bone on bone” was the usual way of phrasing the problem at the gym. I had heard and read about many different theories for the cause of this problem. The most common explanation was worn-out cartilage. Another theory was that weight lifters created an unhealthy imbalance because they developed

muscles that were much stronger than their ligaments and tendons.

My first encounter with shoulder pain occurred when I was 50. It was my right shoulder, and the pain was very severe, forcing me to use light weights. I did a ton of high-rep shoulder exercises using 2- and 3-pound dumbbells. The pain finally subsided after three months.

Then, five years later, the pain came back with a vengeance. Wow, did that hurt! I could not lift a bar off a bench for bench presses because it felt as if someone were driving a nail through my right shoulder. I dealt with it by doing sets of 50 and 100 reps of extremely light-weighted, or freehand, physical therapy movements. I could still work my legs, abs and back, but that's it. No shoulders, chest or arms, because my right shoulder was in some way involved with every exercise. I should mention also that I tried alternative treatments, such as acupuncture and Chinese medicine, but to no avail. I found the best treatment was time and rest, and a year and a half later, I was finally able to resume my normal workout routine.

But it wasn't quite normal, because I was secretly dreading another injury to that same shoulder. Consequently, I would not work so hard as I did before. And then it came, one month before my 60th birthday. I was climbing into the driver's seat of my car, holding a heavy briefcase horizontally in my right hand. As I sat down and simultaneously laid the briefcase flat on the passenger-side seat, I heard something go "POP!"

Oh, no! There goes my shoulder again! I couldn't believe it. Three times in ten years! I thought I would never get back to my workouts again. I felt all washed up. For years my disciplined

workouts had made me feel young for my age, and now suddenly I felt like an old man because I could hardly raise my right arm.

I saw an orthopedic surgeon, who said, after a series of tests, that I had a rotator cuff tear and was a candidate for shoulder surgery. I would get cortisone shots and feel relief for a few days, and then the pain would return. I babied my right shoulder because it hurt so much, and I was living in a state of constant fear of damaging it more. I had won a contest in high school for doing 75 pushups in one minute, and now I could not do a single pushup. I could not even do one on my knees; that's how bad my shoulder pain was.

During this time, I started reading everything I could find on the subject of shoulder injuries. I read dozens of books and hundreds of articles, and then, at some point with all this reading, I discovered an earlier edition of the book you have in your hands, and my life was changed.

What I loved about Dr. Kirsch's approach was that he was saying it was up to me to heal my shoulder — not some passive solution like lying unconscious on a hospital bed while a surgeon chipped away at my shoulder bone to create more room. Dr. Kirsch said that, by regular hanging, I could create the room between bones myself.

Initially, I found it difficult to hang with full body weight for more than 10 seconds. So I would stand on a stool or bench, grab the bar and hang with as much body weight as possible, but always using my feet on the bench underneath to take a little pressure off. I would do hanging exercises for between 15 and 20 minutes per day, with each hang followed by the dumbbell exercises recommended in the book. I used very light dumbbells for those because I regarded

them as flexibility movements rather than strength training exercises. In fact, I often used Indian clubs rather than dumbbells for those exercises.

At some point, 10 seconds became 20 and then eventually 30, which meant that I could hang from a bar comfortably for 30 seconds.

I corresponded almost immediately with Dr. Kirsch. He asked to see my X-rays, which I sent. He then wrote out detailed instructions for the medical imaging lab to take CT scans of every nook and cranny of my shoulder. After he had studied the results, he said that my subacromial arch was curved more than was natural (“hooked” is the word he used) and at times was touching the rotator cuff — creating that “bone on bone” sensation that the weight lifters at the gym experienced. No doubt this was the same source of the problem for many other athletes as well, such as swimmers and tennis players, where their CA arch gets bent down over the years and touches the rotator cuff, creating an impingement that feels like a pinched nerve.

Dr. Kirsch’s advice was to keep hanging. He also encouraged me to talk to some of his patients, which was telling. It was amazing how they all got rid of their shoulder pain by hanging. But what struck me was how they succeeded in a relatively short period of time, with much less hanging than I was doing.

Initially, Dr. Kirsch could not explain this, and he said he was frustrated because I was doing so much hanging and the impingement was still there.

Then one night, just before going to bed, an idea flashed into his head, and he raced to his computer and sent me an email in red type, saying: “You have been a heavy weight lifter for

all these years and your skeletal structures are massive in comparison with folks who seldom lift more than groceries. Your X-ray studies confirm this: You have strong, solid, hard bone, and your CA arch is certain to be very rigid. So there it is: the answer! And it ... will ... simply ... take ... more ... TIME for gravity to bend your CA arch and for Wolff's law to act. You are doing it right, doing a lot of hanging from your bar."

Well, that is what I did, and now, one year later, I hang at least six days a week for a minimum of 30 seconds, for three sets, with each set super-setted with one of the three dumbbell exercises, doing 30 reps in each of those sets. Sometimes I will hang for a full minute, just to test myself. When I hang with full body weight, with my feet several inches off the ground, I visualize my CA arch straightening out. I weigh 195 pounds with 15 percent body fat, which means there is a lot of weight pulling my very dense CA arch a little higher, which is creating space between my CA arch and my rotator cuff.

There are other benefits from hanging, as well, such as improved posture, better balance and relief of pressure on the lower back. I don't mind the calluses on my hands, but if you do, you can always wear weight lifting gloves. I have noticed that my body actually gets taller during a hang, where if I start with my feet three inches off the ground, by the end of 30 seconds my shoes are practically standing flat while I hang. I am not saying that hanging will make you taller, but I suspect it will help in slowing down the natural shrinking that comes with old age.

This treatment has been life-changing because I feel young again. After one year of daily hanging, I have total flexibility with both shoulders, and I can do windmills, jumping jacks,

yoga, archery, throw a football, swing a baseball bat, play tennis and golf, swim — you name it. And of course, I am working out with weights harder than ever, knowing that my shoulder has been remodeled and will never again be injured because of my daily hanging. Talk about a miracle!

Who Should Do These Exercises?

Everyone should do these exercises; because not only do the exercises relieve most shoulder pain problems, they prevent them from occurring.

We humans, along with some of the great apes (the gorilla, gibbon, orangutan and the chimpanzee) possess the unique innate ability to hang by our hands, or to “brachiate.” Like it or not, we humans, if healthy, and these great apes share nearly identical arm/shoulder anatomy and prehensile function, i.e.; the ability to grasp a bar or tree limb and swing from bar to bar, limb to limb.

As children we hung from the “monkey bars” and other playground equipment. Infants are capable of hanging from various supports. Moving on from childhood, most of us turn to other activities including various sports. Very few sport activities require brachiating or hanging. Thus, in time we lose this facility that we were given at birth. Even so, most otherwise healthy persons, if motivated, are capable of regaining the ability to simulate brachiating by hanging from a bar. If they could only find one! Look around you.....you will find it difficult to find something to hang from....suitable hanging bars have been removed from most playgrounds and not provided in most work-out centers.

The exercises described here are for those who want to maintain healthy shoulders, or for those who already have shoulder pain and who have been given a diagnosis of the **subacromial impingement syndrome (SIS), rotator cuff injury or frozen shoulder**. The exercises may be used even in

the presence of rotator cuff tears. If you can lift the arm to the horizon with good strength, you should be able to begin the exercises. If you cannot lift the weight of your arm to the horizon with a natural motion, your rotator cuff tear may be too far advanced for rehabilitation and surgical repair may be your only choice. If the arm can be lifted to the horizon, the rotator cuff will not be further pinched or irritated by the exercises. These exercises are for persons of all walks and ages of life; whether you are a business man, laborer, athlete, man or woman.

The athlete who uses the shoulder for overhead activity will find the hanging exercise very helpful in healing and preventing injury. Swimmers, football, baseball and basketball players all depend on painless repeated arm elevation for their sport. The exercises described in this book will insure maximal freedom and strength with repeated arm elevation.

The hanging exercise is not recommended for persons with unstable or dislocating shoulders, for those in precarious physical health or with severe osteoporosis (fragile bones). If you have shoulder pain that goes unexplained for several weeks, it is wise to obtain a proper diagnosis from your physician.

The typical person that will use the hanging exercise is otherwise healthy but has shoulder pain that appears for no apparent reason. They might suddenly notice that putting on a coat causes pain in the shoulder, or sitting at their computer work station they begin having pain in the shoulder holding the mouse, or doing overhead work of any sort causes shoulder

pain. Others may find that their shoulders begin to feel stiff and have pain that limits their range of motion.

All this being said, the hanging exercise will not cure all shoulder ailments, nor will all persons choose to attempt to hang from a bar. ***The hanging exercise is not a panacea!!!*** The exercise ***will*** stretch the arch of ligament and bone covering the rotator cuff and subacromial bursa (the CA arch), improving or preventing injurious compression of these tissues. There are many other parts of the body that are stretched during a hanging exercise, some of which I will mention later in the book.

The Most Common Shoulder Problem

The rotator cuff is a complex tendon in the shoulder that helps to lift the arm. 95% of rotator cuff tears are caused by the subacromial impingement syndrome (SIS). This condition is caused **by tightness or contracture of the arch of ligament and bone (the CA arch, see Figs. 4 & 5) that covers the upper arm and rotator cuff tendons that lift the arm.** The tightness or contracture of the CA arch causes painful and destructive “pinching” of the rotator cuff. The cause of the contracture of the CA arch is uncertain, but most likely related to disuse and gravity. The average human arm weighs about 10 lbs. The continual pull of gravity on the arm, transferred through ligaments and muscles, very gradually may cause the CA arch to become deformed in a downward direction ultimately pinching the rotator cuff that is already weakened by disuse.

Decreased mobility of the shoulder blade will also increase pinching between the CA arch and the rotator cuff. In the 1966 words of F.J. Kottke [2], a noted exercise physiologist, *“Normal motion in joints and soft tissue is maintained by the **normal movement** of the parts of the body which elongate and stretch joint capsules, muscles, subcutaneous tissues, and ligaments through the full range of motion many times each day.”*

Without overhead arm activity, the space between the acromion bone and the humerus undergoes slow contracture resulting in degenerative changes. This is illustrated by the artist on the next page.

Time, Disuse (not hanging)



Gravity

Fig. 4 This image shows parts of the CA arch and scapula (artist's work adding the rotator cuff tendons to the original bare CT scan image) demonstrating how gravity and disuse may over time produce a hooked deformity of the acromion (**my theory**). It is this hooked deformity that pinches the rotator cuff and the subacromial bursa and may be overcome by the hanging exercise. The view is of a right shoulder.

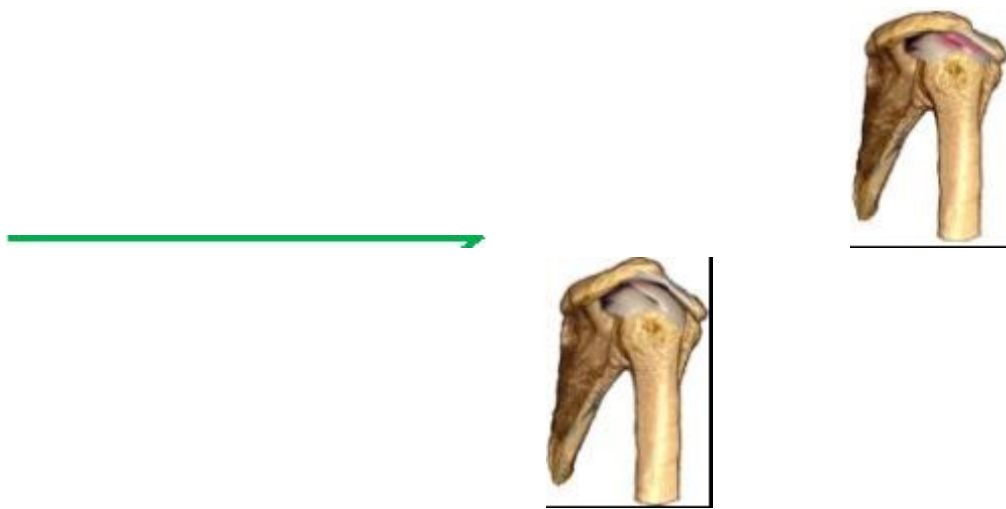


Fig. 5 This deformity may be reversed (**artist's rendering**) by the **Kirsch Institute protocol: Hanging from an overhead bar and lifting light weights.**

As the Twig is Bent...

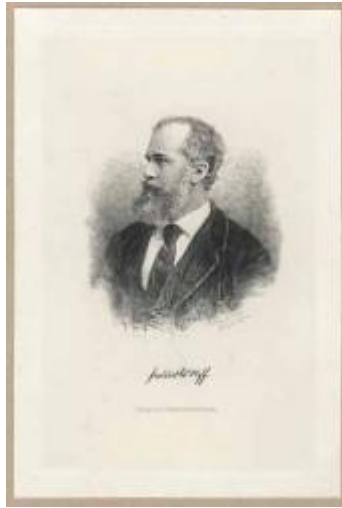
A tree may be reshaped by bending or training its branches. The secret to the most common shoulder problem, the subacromial impingement syndrome (SIS), is that the contracted CA arch tissues can be stretched and reshaped. This we know from a number of facts:

- 1. Bone and other tissues will be reshaped as a result of stresses applied to the tissue. It is the same principle that Orthodontists rely on to straighten teeth by moving them around in the jaw bones. This principle is called Wolff's law [3].**
[\[1\]](#)

We know from laboratory cadaver evidence that the acromion bone of the CA arch will bend and the coracoacromial ligament will stretch when the arm is lifted by a force. In these experiments, strain gauges were placed in the acromion bone of the CA arch to measure the bending [4].

That the coracocromial ligament is stretched with arm elevation was demonstrated by Yamamoto et al in 2010 [5].

- 2. Repeated prolonged bending and stretching employing Wolff's law (see photo on next page) will reshape these structures, providing more room for the rotator cuff.**



Julius Wolff

3. From the radiology laboratory studies (CT scans) upon which this book is based we know that the arm, when fully elevated as while hanging, is positioned to lift and stretch the CA arch.

4. We can also see from the CT images made of the shoulder during the hanging exercise that the scapula undergoes dramatic mobilization with full rotation and elevation, thus reducing the inertia of this structure during arm elevation.

5. We humans all share nearly identical skeletal anatomy (there is a classification of different acromial shapes in the literature that is arbitrary: acromial shapes lie on a continuum from less hooking to more hooking, but all will *bend & remodel* when one hangs) and will respond to the same exercise forces.

Proper stretching of the shoulder will restore the flexibility (compliance) of the CA arch and scapular restraints, relieving the rotator cuff tendon from the destructive effects of its being pinched.

Traditional therapy exercises are not sufficient to stretch and reshape the CA arch or increase the room beneath the arch for the rotator cuff tendon. The usual physician-recommended treatment includes anti-inflammatory drugs that have various side effects, cortisone injections that may weaken the rotator cuff tendon, or surgical removal of important parts of the acromiohumeral joint to make more room for the rotator cuff tendon. Surgery is always an option, but it is not always successful, is an invasive expensive undertaking, and may weaken the CA arch or disrupt the normal function of the CA arch/rotator cuff complex.

The exercises recommended in this book have four goals:

- 1. Reshaping the CA arch tissues (bone and ligament covering the rotator cuff tendon) and restoring the flexibility of these structures.**
- 2. Stretching the shoulder joint lining (the capsule) to relieve the frozen shoulder.**
- 3. Stretching the shoulder blade restraints to allow full rotation and elevation of this structure.**
- 4. Restoring the health and strength of the rotator cuff tendon and muscles that lift the arm.**

Many of the images in this book are taken from CT scans made for the purpose of studying the live anatomy during a simulated hanging exercise. **They are presented in the book to help you visualize and understand how it is possible for the hanging exercise to stretch and reshape the CA arch reducing pressure on the rotator cuff. It is by viewing the shoulder in the hanging position from many different angles that will allow readers to understand what**

is happening in their shoulder while they hang. It is well said that “A picture is worth a thousand words.”

The hanging position is *simulated* as it is not possible to make CT scans in the upright hanging position. The scans were created by having the live subject hold a 40–60 lb weight with the arm fully elevated while lying supine in the CT scanner bed.

Using computer analysis and editing software, most of the images have had other skeletal parts deleted to allow you to focus on the relationship between the humerus bone and the CA arch. I believe the average reader should be able to understand the anatomy as presented. The skeletal images are straight forward. The “slice” images may be a little confusing at first, but with some study should be understandable. The slice image is no different from cutting a branch from a tree and counting the rings. That would be “the anatomy” of a tree, or a “slice” of tree seen on end or cross-section.



Fig. 6 The technique used to simulate the overhead hanging position. The subject lies supine in the CT scanner holding a rope attached to a bucket holding 40-60lbs weight. The supine position is the only position possible with current CT scanners. This position does allow a close simulation of the anatomy in the vertical hanging position.

The CA Arch

The CA arch is a curved structure in the shoulder that overlies the rotator cuff tendons and includes the coracoacromial ligament, the acromion, the coracoid process and other ligament's connecting the acromion and the coracoid process. An understanding of the CA arch is central to this book. This section of the book is devoted to help you visualize what the CA arch is and why it may be stretched during the hanging exercise, and why this is of such importance. It will take some time to become familiar with the unusual angles of view in these images. Because of the difficulty in presenting these three dimensional structures, it is hoped that viewing the shoulder from many perspectives may help overcome this difficulty. For that reason, I have included in the book an overabundance of images to depict the CA arch. Viewing the volume (3D) images and videos at www.kirschshoulder.com from which many of the figures in this book are taken will be well worth your time.

It is the contracture of the CA arch that is responsible for most of our troubles with our shoulders. It is the CA arch, if not stretched by overhead use of the arm including a hanging exercise, that will contract, pressing on the rotator cuff and producing irritation, inflammation, degeneration of the tendon, and pain.

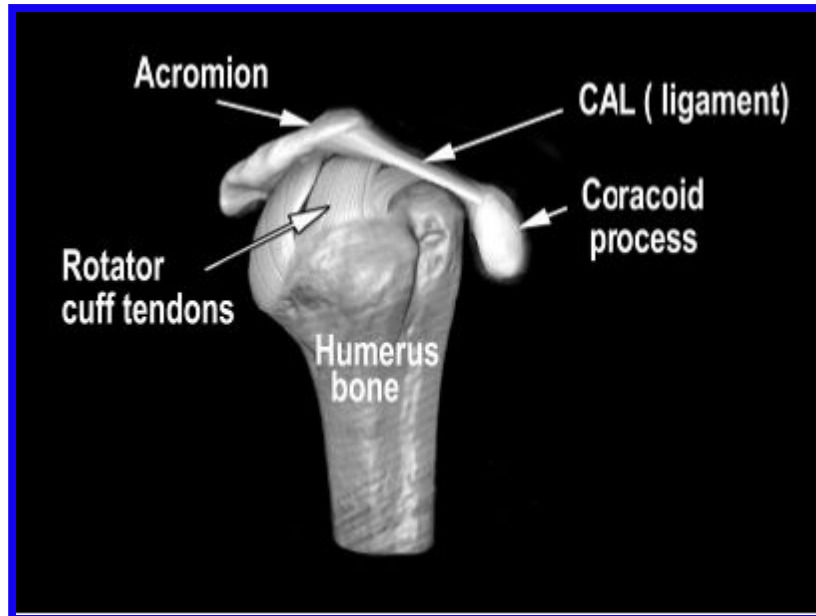


Fig. 7 An artist's rendering of the CA arch. The CA arch (solid white arrows) is highlighted. The outlined arrow indicates the tendons of the rotator cuff. The upper arm bone, the humerus, is labeled. For clarity, the bursa beneath the CA arch is left out (the sub-acromial bursa). The view is of a right shoulder from the side. The image was created from a combination of the artist's work overlaid on CT imagery of the skeletal parts.

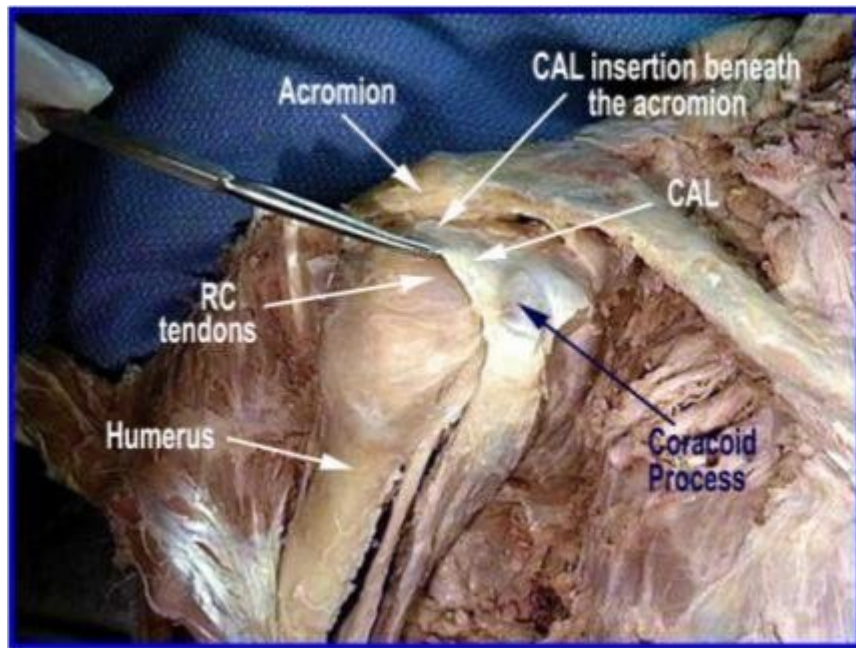


Fig. 8 A *cadaver view of a right shoulder showing the CA arch (the CAL, Acromion & Coracoid Process). A probe has been placed beneath the coracoacromial ligament (the CAL) to lift this structure for demonstration. Notice that the ligament inserts on the **undersurface** of the acromion. This position of the CAL allows it to provide a gliding surface for the acromiohumeral joint. Notice how the CAL overlies the rotator cuff (RC) tendons and may compress the RC if deformed by contracture.

***(Cadaver dissection performed by the author for this book in the cadaver lab at the Christine M. Kleinert Institute for Hand and Microsurgery, Louisville, KY)**

Beneath the CA arch is the space for the rotator cuff tendon that lifts the arm and a thin sac of tissue called the subacromial bursa. If this space becomes too tight, the rotator cuff tendon moving beneath this CA arch will be “pinched” resulting in various degrees of pain and inflammation, degeneration and tearing of the tendon as well as some degree of irritation of the subacromial bursa. For practical purposes, the bursa beneath the CA arch will be ignored in this section of the book and attention focused on the rotator cuff tendon and the CA arch. The bursa will be discussed later in the book.



Figs. 9 & 10: This CT scan was made with the subject holding the arm at the side, or in the “anatomic” position. This CT study was done to compare the

structures in this position with the simulated hanging position. Fig.10: The side view of the shoulder with **the CAL (coracoacromial ligament) added to the image by the artist**. It should be easy to understand from the position of the ligament that it covers the structures beneath it and if the **compliance** of this ligament is not maintained by repeated stretching, it may contract and press on the underlying rotator cuff causing degenerative changes and tearing within the tendons of the rotator cuff.



Fig. 11 In this image the rotator cuff tendons have been **added by the artist**. It should be easy to see how from the position of the CA arch ligament and bone it may compress and irritate the rotator cuff tissues if deformed by gravity, time and disuse.

When a person raises their arm above the horizon, the rotator cuff is no longer beneath the CA arch and will not be pinched. **In fact, while doing the hanging exercise, the rotator cuff tendon is fully relaxed and far behind the CA arch.**

The inflammation in the irritated tissues may also cause shoulder stiffness resulting in a “frozen shoulder.” The exercises in this book will stretch the joint lining (the capsule)

to relieve this condition. In **Fig.12** on the next page, you can see that once the arm is raised to about 90 degrees or level with the ground, the attachment area for the rotator cuff tendon is behind the CA arch .and out of harm's way.

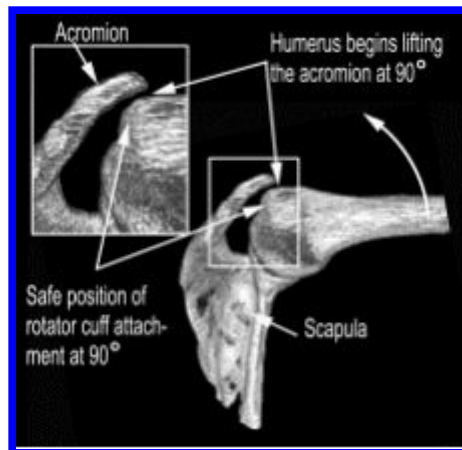


Fig. 12 A CT scan image of the left shoulder of a live subject holding the arm at 90 degrees elevation. **This CT study was made for the sole purpose of demonstrating the safe position of the rotator cuff with the arm elevated to the horizon.** The view is from the side of the subject. Notice that the rotator cuff attachment area has already passed behind the acromion part of the CA arch that could cause pinching of the rotator cuff. When the arm is elevated a little higher, notice how the upper part of the humerus bone will come to a position to contact and lift the acromion.

Once the arm is brought above the horizon you begin stretching the CA arch with the upper part of the humerus (upper arm bone). When the arm is elevated by the hanging exercise, the scapula is rotated and elevated to its fullest extent, positioning the CA arch for maximal stretching. The repeated hanging exercise will restore the mobility of the scapula (shoulder blade), reducing the pressure on the rotator cuff during initial arm elevation.

The daily life of modern man does not provide sufficient opportunity to properly stretch this important part of the shoulder, the CA arch. The hanging exercise, using the force of gravity, will provide the force and stretching that will reverse the process that led to the deformity and inertia of the CA arch. Hanging from an overhead support is an important normal human activity that modern man has neglected.

Journalist Matthew Brown's Summation of the Book

“Making his mark on shoulder pain one monkey bar at a time” by Matthew Brown

(Originally published in the *Portage County Gazette*, June 29, 2012)

Dr. John Kirsch, Stevens Point, was hiking with his kids in Peninsula State Park in Door County in 1983 when he stumbled upon an idea that helped change his thoughts about the human shoulder. “We hiked and we came across a horizontal ladder station...the kids went across like monkeys,” said Kirsch, an orthopedic surgeon who practiced in Stevens Point for many years. “I attempted to get to that second rung and I knew, I immediately knew, why I was having trouble with my shoulder.”

Kirsch's realization was that human shoulders in their modern contexts become misshapen, weak and prone to injury over time. The solution, said Kirsch, both as treatment and prevention, is to re-engage the shoulder's natural movement by hanging from an overhead bar. “I cured myself in six months, but I didn't fully understand it,” said Kirsch.

In 2004, while working in Beaver Dam, Kirsch used a CT machine to study the shoulders of live subjects in hanging positions. Kirsch's research led him to a deeper understanding of the shoulder and spawned a manuscript and a 600-slide power point presentation that evolved into a book called *“Shoulder Pain? The Solution and Prevention.”*

After publishing the second edition of the book, Kirsch founded the **Kirsch Institute for**

Shoulder Research as a way to reach out to more people

“I’ve had many hundreds of people whom I’ve helped help themselves,” said Kirsch, who has received emails from people with shoulder issues from all over the world, including everyone from a violin teacher to a one-time Mr. Universe contender.

Kirsch’s idea, as one critical review on Amazon points out, is fairly simple, “Fix your shoulder by hanging from a pull-up bar.”

Kirsch said the simplicity is part of the point. “I didn’t write this book to make money,” said Kirsch. “I wrote this book because it is a moral obligation to share something as simple as this solution... people do not use the shoulder as it was designed to be used. Kirsch said “Humans – in the same family of primates as orangutans, gorillas, chimpanzees and gibbons – are built to swing from tree limb to tree limb, a means of locomotion called brachiation. “Man has not adapted from his arboreal past and men still have the shoulders of an arboreal creature,” said Kirsch. “It’ll be millions of year before man adapts to walking on two legs... (Meanwhile) Humans have gone from rocks to computers in a few thousand years.”

This evolutionary disconnect, represented in his children’s success and his failure at the horizontal ladder, began Kirsch down a road of further research into the human shoulder and the development of a way to simulate the brachiation absent in modern human life.

The Kirsch’s Institute protocol calls for hanging from a horizontal overhead bar and light weight lifting. For most people this means hanging for about 30 seconds three times a week, and lifting

a light weight over their head with each arm for 30 to 40 repetitions a couple of times a week.

This amount of effort, said Kirsch, is sufficient to remodel the shoulder, reducing shoulder pain, while also strengthening the muscles that move the arm. Kirsch claims that this protocol can be expanded to deal with more complicated issues including rotator cuff tears and frozen shoulder.

*“It’s equally beneficial to maintain floor contact and do **partial weight hanging**,”* said Kirsch of partial hanging for people with limited hand strength or excess weight. He said the hanging itself is initially painful as it reshapes bone in the shoulder, but the pain is not harmful to the shoulder’s tissues as believed by other shoulder therapists and surgeons.

Kirsch has relied heavily on testimonials to support his claims. In the fourth edition of the book, the title will be appended as “The Kauai Study” in reference to a study Kirsch presented this spring at the first combined Australian/American meeting of the American Association for Surgery of the Hand in Kauai, Hawaii, that showed 90 of 92 subjects with shoulder problems were “restored to comfortable activities of daily living” using Kirsch’s non-surgical approach to the shoulder.

Kirsch said many in his profession are skeptical of the approach, though it is gaining some momentum. “Some physical therapists are starting to understand the need to simulate brachiating,” said Kirsch, who said he recently received his first email inquiry from an orthopedic surgeon interested in the technique.

Kirsch, an early member of the American Arthroscopy Association of North America, began his career at the Rice Clinic in Stevens Point in 1979 when the demand for his

arthroscopic surgery services, a procedure that allows doctors to repair joints with minimally invasive surgery, was high. Kirsch's work, mostly on knees, meant elevating his arms up to eye-level for long periods of time, which is when his shoulder issues first began.

For more information about the book and the Kirsch Institute for Shoulder Research visit www.kirschshoulder.com

Sleep Apnea and Sleep Position

By Thomas J. Honl, DDS MAGD FAACP AADSM Diplomat
Eligible

Obstructive Sleep Apnea (OSA) is a serious medical condition affecting nearly one in four Americans today. It is a disorder that affects both men and women, and surprisingly 90% of those affected remain undiagnosed and untreated. The two most common indicators of OSA are snoring and excessive daytime sleepiness.

Obstructive Sleep Apnea presents during sleep, in which a sufferer struggles to breathe as the result of a blocked airway. This blockage occurs in the throat at the base of the tongue when the muscles relax, causing the airway to collapse. As a result, snoring commonly occurs, but people who suffer from OSA can also stop breathing completely for measurable periods of time. Oxygen in the blood can then plummet to harmful levels, stimulating the brain and triggering a response to awaken many times throughout the night. This decrease in available oxygen produces tremendous stress on the body, contributing to serious health problems such as high blood pressure, heart disease, stroke and even death. Other related co-morbidities of OSA include acid reflux, depression, dementia, cancer, decreased sex drive, cloudy thinking, obesity, diabetes, daytime sleepiness.

Continuous Positive Airway Pressure (C-PAP) is a common first line treatment in cases of moderate to severe OSA. C-PAP uses pressurized air to prevent the airway from collapsing during sleep. C-PAP is effective in all sleep positions, however many patients cannot tolerate C-PAP.

Oral Appliance Therapy (OAT) is an effective treatment for mild to moderate OSA. It is also

recognized as a first line of treatment for people who are intolerant to C-PAP, or for people who simply prefer OAT. Appliances must be properly fabricated and fitted by an experienced dentist who practices dental sleep medicine.

Controlling sleep position can sometimes aid in the effectiveness of Oral Appliance Therapy. In some OSA patients, sleeping on the back contributes to the natural pull of gravity on the relaxed tongue, causing it to fall into the airway and block airflow. Therefore, it is sometimes necessary to encourage a side sleeping position. A device that wraps around the waist and resembles a small backpack is comfortably worn by patients while they sleep to keep them off their backs.

However, side sleeping requires pain free shoulders. In my experience, the least invasive, least costly and most effective remedy for painful shoulders is the hanging technique introduced and taught by John M. Kirsch, MD in "Shoulder Pain? The Solution & Prevention". In conclusion, pain free shoulders can make the difference in the success of Oral Appliance Therapy for patients with Obstructive Sleep Apnea, a debilitating and deadly sleep disorder.

Dr. Kirsch's contribution to shoulder rehabilitation has allowed me to increase the effectiveness of Oral Appliance Therapy for my patients.

The Exercises

The first and by far the most important exercise that will relieve shoulder pain by reshaping the bone and ligaments that pinch the rotator cuff is **hanging from an overhead bar**. [2] This is the **only** shoulder exercise that will effectively stretch, bend and reshape the CA arch to provide more room for the rotator cuff. If you already know that you have a tear of your rotator cuff from an MRI study or some other tests, the hanging exercise will not worsen the tear. While hanging, the rotator cuff is relaxed and far behind the offending CA arch. Be sure to remove any hand jewelry that might interfere with hanging onto the bar (rings, etc.). Weight lifting or golfing gloves may be helpful if the support bar is roughly textured or too slippery. Weight lifting hooks that strap to the wrist may also help in grasping the bar. The bar may be wrapped with rubber foam tape to ease the pressure on the fingers. As time goes on with your hanging program, you will notice that calluses will form on the palmar aspect of your fingers and palms. This is a normal response to the hanging exercise but may be diminished using the gloves and bar padding.

Partial Weight Hanging

At first you may not be able to hang with full body weight. You may begin by keeping the feet on the floor and grasping the bar positioned lower, and stretch by “partial” hanging until strength an strength an strength and reach improves.



Fig. 13 Partial weight hanging. A fitness instructor on the left demonstrates partial hanging using a support ladder.

If you decide to do the partial hanging exercise, keeping your feet on the floor or stool, it is imperative that you allow gravity alone to act on your shoulder. Do not attempt to regain your mobility by pressing the arm or hand against a wall, or force the arm backward with the bar. As you will see later in the book under the section “The Human Pendulum,” you cannot over-rotate the shoulder using gravity alone.

The hanging exercise is done over a ten to fifteen minute period during which you hang for 10–30 second intervals using both hands as tolerated, applying full or partial body weight. You should hang for brief intervals at first, taking rest breaks for a minute or so. While hanging, the shoulders and body should be relaxed allowing gravity to act on the shoulder muscles, bones and ligaments. Allow gravity to do its job. The only body parts which should be active are the hands for gripping the bar. The hands must be in a position with the palms forward, not in the chin-up position. The chin-up arm position will not stretch the CA arch, as in this position, the arm bone (the humerus) cannot be raised high enough to lift and rotate the scapula and apply a bending force to the CA arch.

Most persons **will have a fair amount of pain** or discomfort when first attempting to hang. The exercise is in this sense counter-intuitive, or paradoxical: *paradoxically, the pain experienced while hanging from a bar will not injure the shoulder, but must be accepted* to overcome the contracture of the CA arch and stiffness of the scapular restraints. If you do not have pain while hanging, the exercise is still important to *prevent* contracture of the CA arch! Remind yourself while you are hanging that **you are S-T-R-E-T-C-H-I-N-G the CA arch. You have taken the first step in reshaping the CA arch.** On the next three pages are pictures of people doing the hanging exercise using bars and even a tree limb...nature's hanging bar!



Figs.14-16 People hanging. On the left is a young woman lap swimmer who developed shoulder pain from the subacromial impingement syndrome, a common problem for swimmers. She erected her own hanging bar on the back porch, performed

the hanging exercise and successfully treated her own shoulder pain.



Figs. 17-19 People doing the hanging exercise and a ceiling mounted hanging bar. The author hangs from a handy tree.



Fig. 20 On the left a physical fitness director demonstrates hanging using a ladder to reach the overhead bar. The subject on the right solved her 35 years of shoulder pain with the partial weight hanging exercise.

Making a Hanging Bar

Making and erecting your own hanging bar needn't be costly, but it is a challenge to erect a suitable bar at the right height that you may hang with your feet hanging free of the floor or ground. Any sturdy pipe, weight lifting bar or similar material 3–4 feet long will do. It may be hung with strong rope or chain. If you do not install eyebolts to hang the bar, be sure to tape the chain or rope so they won't slip off the ends of the bar.

Warning!

Do not pass the rope through the drilled holes in the bar! The holes will cut the rope and you may be seriously injured when they break!



Fig. 21 A simple hanging bar design & a free-standing aluminum bar. Both of these hanging bars are available at:

www.kirschshoulder.com

www.trapezeartist.com

www.hangingbar.com

A free-standing hanging bar may also be built from simple common pipe materials as in the design on the next page.

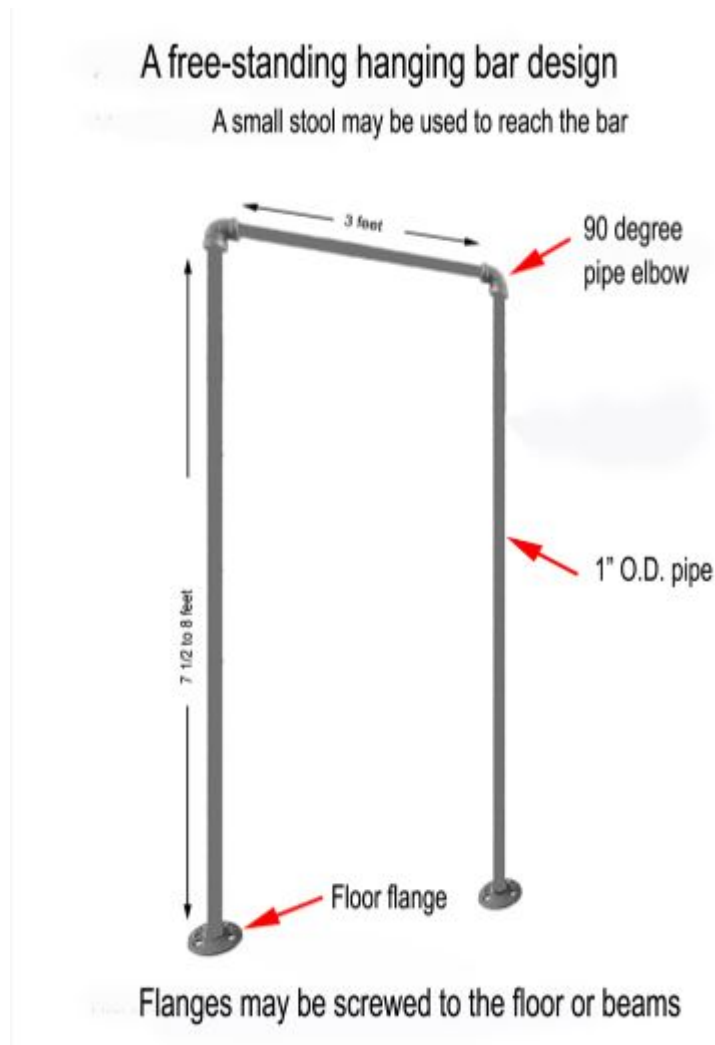


Fig. 22 A free-standing hanging bar design.

You must decide where you will do the exercise. Find a space where you can suspend your whole body height with your arms up grasping the hanging bar. Although it is tempting to place the bar in a doorway frame, this space will usually not allow the full hanging exercise force. Ideally it should be indoors in a heated space that is easily accessible. You will not be doing gymnastics with your hanging bar, only suspending your body from the bar for a few minutes each day.

Hanging a bar from ceiling joists in the basement or garage is probably the most convenient place, unless you have the luxury of an exercise room. If you live in an apartment, there is usually a commons area in which the building superintendent will allow you to install the bar. Your office may also be a good site for the hanging bar, or your gym may already have such a bar in place. Other suggestions are to hang the bar outdoors between trees or well-fixed posts. Attaching the hanging bar to an indoor ceiling is possible, but you will need to be certain that hooks will be securely screwed through the ceiling into solid joist material.

Lifting Weights

The hanging exercise is followed with weight lifting exercises that are best performed immediately after the hanging exercise; for it is then that the CA arch has been stretched allowing the rotator cuff tendon to move more freely beneath the arch. These simple weight lifting exercises are important for strengthening the rotator cuff muscles and other muscles that raise the arm. Strengthening these muscles will balance the forces around the shoulder and restore the rotator cuff tendon and muscles to a robust healthy condition. The weight lifting exercises, while straight-forward, require more effort than the hanging exercise. Hanging from an overhead bar is largely a passive exercise employing only the fingers to hold the bar. Lifting weights, on the other hand, requires the active use of many muscles about the shoulder, most importantly, the rotator cuff tendon and muscles. And, this requires work and discipline!

The weight lifting program is begun when one is able to raise the arm above the horizon with no added weight. Dumbbell weights of 1–8 lbs are used, doing as many repetitions and weight as tolerated, increasing the repetitions and weight as time goes on. A realistic long term goal for most persons is 30 to 45 repetitions with 5–8 lb weights. These exercises should include at least forward, lateral and extension arm elevations with the arm positioned with the palms down and brought to full elevation with each repetition. The palms down position is important, as it positions the upper part of the humerus bone to contact and stretch the CA arch ligament and bone.

If you already know that you have a rotator cuff tear, the weight lifting exercise should be performed with some precautions. By lifting lighter weights, doing fewer repetitions and avoiding arcs of motion that are painful, you should be able to “work around” the area of the rotator cuff tear and strengthen the parts of the rotator cuff that are still intact and healthy. Small rotator cuff tears may heal once the CA arch is stretched and remodeled by hanging relieving the pressure in the subacromial space (the space beneath the CA arch). The weight lifting exercises are shown below.



Fig. 23 Model doing the side weight lifting exercise. Your goal is to do 30–45 repetitions at any weight before increasing the weight of the dumbbell. Note the palms down position of the hands.

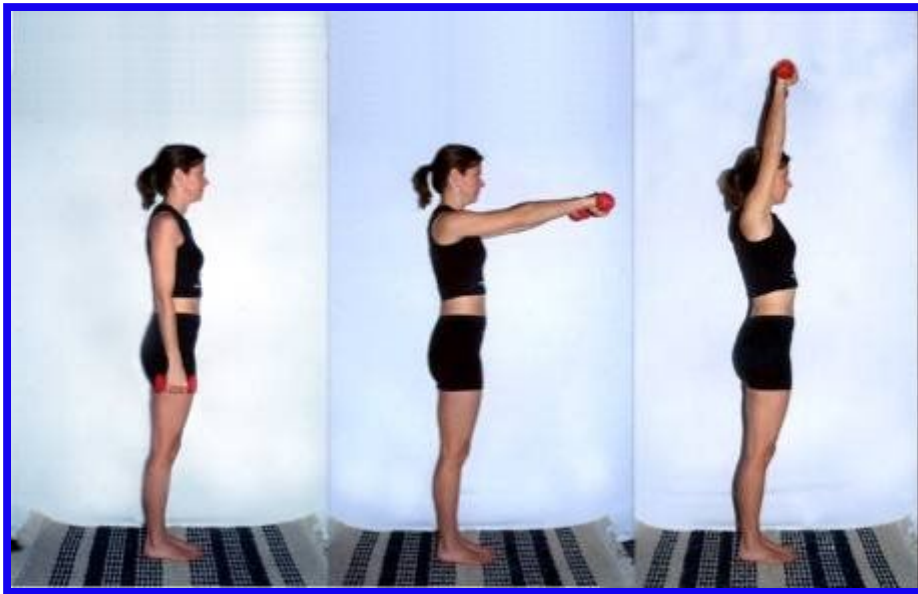


Fig. 24 Model doing the forward weight lifting exercise. Your goal is to do 30–45 repetitions at any weight before increasing the weight of the dumbbell. Note the palms down position of the hands.



Fig. 25 Note the palms down position of the hands while lifting weights. This position allows the humerus to lift and stretch the CA arch. Take your time with your program, and after some months go by, vary the program so that it will not become a boring routine.



Fig. 26 Model doing the extension weight lifting exercise. In this exercise, the weights are brought from a vertical position backward and upward into extension as high as possible. Your goal is to do 30–45 repetitions at any weight before increasing the weight of the dumbbell. Note the palms face the floor.

Doing these two exercises, **hanging from a bar** and **weight lifting** should require only 15–20 minutes of your time each day. When the shoulder symptoms decrease, the exercises may be performed less often (perhaps only 2–3 times each week), but intermittent hanging and weight lifting should be continued as a life habit. Do not be in a hurry to progress with the exercises. Take your time, but keep at it. Remodeling the tissues will continue for many years after you begin the program. Over time, you will find that your weight lifting program need not be so regimented, and you will develop your own pattern. As an example, perhaps you might lift in only one direction one day, and the next day another direction. Perhaps your weight lifting will be performed only a few times each week.

Listen to your body and follow its advice!

**Roleigh Martin's Tips for Hanging
Equipment & Hanging Technique:
Bar Hanging for Shoulder
Health – A Consumer Guide
to Therapeutic Bar Hanging**

By Roleigh Martin, M.A.

Dr. Kirsch graciously asked me to provide this chapter. At his institute, Dr. Kirsch gave me his PowerPoint presentation. It is amazing how little orthopedic medicine appreciates the benefit of bar hanging but it is understandable because it could eliminate much surgery, threatening one's income. I doubt if surgeons intentionally reject this knowledge. Their interest is in surgical improvements and likely focus on surgical journals and not on self-help books.

To see a nationwide change on how to dominantly cure shoulder problems, it will take the effort of readers who benefit from his protocol to spread the word.

This could be done by sharing the book and information in it with your local YMCA or fitness facility. By promoting this protocol to such facilities, you will find institutions who are or will be receptive to bar hanging.

At my YMCA, some trainers said they enjoyed the book and introduced others to the protocol. Some have helped their own shoulder problems. I cannot think of a more likely receptive professional audience who should be open to this book and might promote its concepts.

This original document has links and more. You can read it by visiting my Google Profile page at <http://tinyurl.com/3vno1h8>

Look for the link "My Shopping Guide to Shoulder Pain? book."

Background

In 2011 I developed a “Frozen Shoulder.” Wikipedia explains:

“Frozen shoulder, medically referred to as adhesive capsulitis, is a disorder in which the shoulder capsule, the connective tissue surrounding the glenohumeral joint of the shoulder, becomes inflamed and stiff, greatly restricting motion and causing chronic pain.”

Since then, I received non-surgical treatments and physical therapy (detailed in the above link). Progress was steady but slow. Then I read Dr. Kirsch’s book and greatly accelerated my recovery.

Within two months I was able to lift my right arm behind my back without my left arm assisting and am only about 1-2 inches short of being able to touch my right shoulder blade. I can remember when it was painful to lift my wallet out. No more!

I first started bar hanging (partial body weight) on a Monday and 4 days later I did my first full free hang totally off the ground (only for two seconds). Since June, 2012, I am hanging daily in 4 minute single sessions. I do use comfortable gloves with steel hooks in them (more later) to hang that long. With ordinary gloves, I can only hang for 30 seconds straight.

Equipment Choices

Most people can begin to hang from a bar without special gloves or equipment. Your local gym/YMCA is a good place to start. Do a partial hang from an overhead bar and see how it feels. If you seek more information about installing a bar in your home or using protective gloves or hooks, I provide the following information.

To do the hanging exercise, I recommend a setup where you use a step stool to get up to the hanging bar and are able to do a full body hang and when done, using the step stool to step safely back on the floor. (See the step stool behind me in the photo.) These are your choices:

- A. Obtain a hanging bar from the Kirsch Shoulder Institute.
- B. Build your own free-standing hanging bar rigged from 1" O.D. cheap plumbing steel pipe.
- C. Order a free-standing hanging bar setup.
- D. Order a ceiling attached hanging bar suitable for the garage or basement.
- E. Order a portable pair of triangular hanging rings (for traveling).
- F. If you have a backyard, weather is moderate year-round and you want a setup for children as well as adults, then consider outdoor equipment that supports multiple concurrent different heights.

I took option "C" and it is described first. I show the accessories I got as you would also probably want them for whatever option you choose.

Free Standing Hanging Bar Setup

Because I live in an apartment, I needed a free standing hanging bar setup and I did not want to make one out of plumbing pipe for aesthetic reasons.

I went with the Elite XL Pull-up Hanging Bar system at www.trapezerigging.com (see picture at left). Cost is \$350. The



hanging bar adjusts to 92". It is beautiful and I feel fantastic after doing a full hang using hook gloves and not touching the ground.

(Photo by Joanne Hihn) If you are taller than 5'8", consider the "Free-Bar" at steelfitstrength.com. Cost \$599. For just grip-hanging, the Elite XL bar is fine up to 5'10", it is hanging with the hook gloves that reduces it to 5'8". The SteelFit Strength bar adjusts from 2-9' high.

There are other free standing Pull Up Bar stations such as three models sold by Torque Athletic which have adjustable heights up to 9 feet but the diameter of their bar is 1.5" and the gloves I recommend work with diameters between 1" and 1.25". The SteelFitStrength bar is only 1.25" diameter and works. The Trapeze Rigging Elite XL bar has a 1" diameter and is perfect.

Accessories and Using a Pull Up/Hanging Bar

Get two pairs of gloves. One can perform two sessions of bar hanging, alternating the gloves you wear, giving yourself a break. For one session, I recommend using ordinary work or sport gloves that will protect you from getting calluses, as you are using your hands only.

For the other hang, I recommend the Haulin' Hooks "Onlys" at lpgmuscle.com. Ask via their "Contact Us" page for the wide hooks, as your four (non-thumb) fingers can fit over them. These comfortable gloves are guaranteed for life. They cost \$64. Avoid the optional colored tubes if the diameter of your bar is more than 1". I tried cheaper gloves but they only lasted 5 weeks before ripping.

The "Onlys" allow you to hang using the strength of your wrists instead of your hands. Note in the above picture how much foam cushion (5mm) there is around your wrist. No need to put on a wrist cushion wrap underneath these! They are rated for 650 pounds.



Avoid their Lady specific gloves, as they have a strap that is useful for weight lifting but not bar hanging. Get just the “Onlys”. When you contact and ask LPGMuscle.com for their wide-hook “Onlys”, also inform them of your wrist circumference (default is for 7.5” or wider).

When you get your gloves, ensure the hooks are inserted into the outer sleeve not the middle (left one shows how shipped). A little soap assists in removing/reinserting.



To effectively and comfortably use these gloves, hang as follows: About 80% of my hang is with 20% of my weight held by 4 fingers wrapped around the bottom part of the hook (see picture at right). About 20% of my hang is with my fists balled up and the gloves are holding me up entirely by wrapping around the outside ball of my wrist (see picture at below left). Those who like it feel a better stretch. I slightly rock my body and legs towards the end to get a better stretch. I always am off the ground by about 3”, it’s a full body weight hang. Note: the gloves are wrapped around the wrist 100% of the time for both methods.

A warning:

One reader dislikes these hooks. He said a 45 second hang, using either method, caused bruising on the hand. He hangs for a minute at a time and can do up to 10x1 hanging sessions a day. So my recommendation is suitable for some but not for all.

I presume you want to get your shoulder healthy fast. If you try these gloves and find them comfortable, you will be able to



hang longer and shoulder health should come faster. If you find hanging by grip is better, then consider selling your Haulin' Hooks on Ebay or return them to LpgMuscle.com if you discover you are not satisfied within 30 days per their stated return policy. Bar hangers are split between using either grip-strength or Haulin' Hooks, sort of like the Mac and PC world. Try to build up your grip

strength with the ordinary (no hooks) gloves.

A step is **integral** to bar-hanging with hook gloves and nice for grip hanging too. I have my Gold's Gym Multi-Function Step Deck and Balance Trainer which I acquired at Walmart for \$39. I have it set for maximum height which is 8" off the floor. I have it centered between the sides of the pull up station and pushed back against the side-stabilizer bar, so that the front of the step is six inches back of the Elite vertical bars. If you need more than 8", consider a steel Plyometric Box (7 heights) from adamantbarbell.com.

Keep track of your hanging progress. I found the Presto 04213 Electronic Digital Timer at Amazon for about \$7.

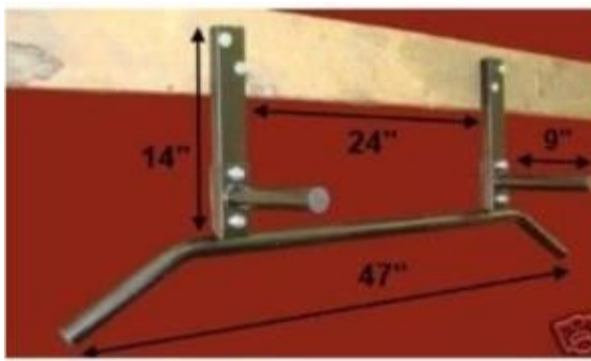
On the next page are pictures of the timer taped to the bar (with ordinary wrapping tape). One pushes the first (left-most) two buttons at the same time to reset the timer to zero seconds. One pushes the far right button once to start the timer, and another time to stop the timer. Use it to record the cumulative number of seconds done daily.



If you have a Garage or Basement with a Tall Ceiling



If you have a garage or basement, consider the Stud Bar Pullup Bar at www.studbarpullup.com. It comes in three sizes, each accommodating two different heights, and accommodates a wider range of ceiling heights (8', 9' or 10'). Cost is \$139.95. Diameter is 1.25" (OK for Haulin' Hooks).



If your basement's ceiling is about 8-9' high and you have an open joist (or a garage ceiling of similar height and open joists), consider the Joist Mount Chin Up Bar

Rafter Mounted Pull Up for P90x W/front Handles listed at Amazon. It does not support multiple heights that Stud Pullup Bar does but is cheaper, costing \$42. Diameter is 1.25" (OK for Haulin' Hooks).

A Traveling Solution – The Freestyle Trainer



I purchased the Freestyle Trainer Rings from Ringtraining.com so that I could easily bar hang while traveling. Some of the cited features are:

- Quickly setup anywhere, including beams, bars, power racks, swingsets, doorways and even trees
- High ceilings? No problem with

the 17' range straps

- Foot straps for challenging new core and lower body exercises
- Fast height adjustments with measurements to ensure rings are level

The complete set weighs 3.25 pounds.

You could just use this to do your shoulder exercises too. However, for an apartment renter, a free-standing solution is still the best permanent solution. But if you travel and have a way to easily setup this system at home, you could get by with just it.

In the picture I show it hanging from my pull up bar.

The Kirsch Institute Hanging Bar (for Travel or Home)



At www.kirschshoulder.com, or at www.hangingbar.com, two different length hanging bars can be ordered for \$39-\$49. They come with built-in eyebolts for attaching to beams in a garage or high ceiling basement. One is made for traveling that weighs 1.5 lbs (lightest solution known). Both have a diameter of 1.125" (OK for Haulin' Hooks). These bars need rope or chain to be used and are perfect for the do-it-yourself person. Be certain to use eyebolts for the rope. Do not pass the rope through holes drilled in the bar! The holes will cut the rope.

Outdoor Backyard Solutions – A Triple Horizontal Bar



Sportsplayinc.com has a Triple Horizontal Bar that is meant for outdoors and needs to be securely and permanently installed into the ground. It is adjustable for each of the bars up to one (or all) of

the bars to be 8 feet high. If you have children, you could set them to different heights. However, the horizontal bar has a 1.375” diameter, too large for the recommended Haulin Hooks. Cost is \$650-\$753.

At steelfitstrength.com, they have a “FREE-Grid 12’ Pull Up & Squat Rack System” which is a free-standing version of the above (but can also be permanently anchored), indoors or outdoors, and each of the three bars can be adjusted up to 9 feet high. Their diameter is 1.25” (OK for Haulin’ Hooks). Cost is \$1349 (without Squat Rack option).

The Zero-Cost Equipment Solution – Your YMCA

At the YMCAs I have used, they have many pull-up stations made by www.cybexintl.com. The “All in One”, “Dip/Chin Assist”, “Jungle Gym” or “Big Iron Multi Rack” are the 4 most common stations. You can use any. All you need are gloves (either style). You may need a stool and can borrow aerobic steps but ask a YMCA trainer. Other gyms may work.

Building Your Own Hanging Bar

Elsewhere in this book, Dr. Kirsch shows a full-size diagram of a build-it-yourself hanging bar.

Be Safe in Your Choice of Equipment

Regardless of your choice, double check that your body weight will not pose a risk. If in doubt, check the manufacturer’s specifications or if concerned about the load stress on what you are attaching to, consult your local building inspector. They have knowledge about load stress and rafters, etc. This is obviously more a concern the heavier you are.

Also pay attention to the minimal health considerations Dr. Kirsch recommends for following his protocol.

A Set of Dumbbells That Meet Dr. Kirsch’s Requirements

Elsewhere in this book, Dr. Kirsch recommends a simple weight lifting program which can be begun when one is able to raise the arm above the horizon. He recommends starting out with one pound dumbbells, incrementing with one pound weights, up to 8 pounds.

The online version of this chapter reviews many dumbbells, but here I focus on what to do for the weights of 1 through 5 pounds. Go to Amazon.com and search for “vinyl dumbbell set 10 pieces” (do not include the quotes). Many entries will come back, but make sure that the one you pick is for a set of five pairs of dumbbells: a pair each at 1, 2, 3, 4, and 5 pounds.

Once you are up to 5 pounds per dumbbell, refer to the online document for what is available beyond that.

Follow-Up

Dr. Kirsch has a FAQ (Frequently Asked Questions) page at his web site. For those who have more questions, sign up for the study program there.

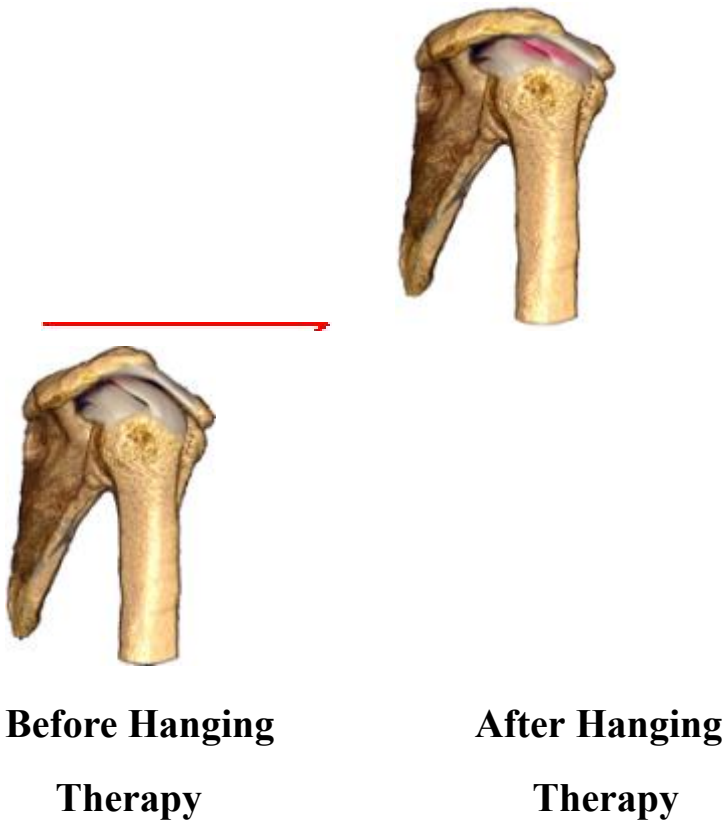
Eventually, if you feel up to doing more on your bar, Al Kavadlo has written a great, heavily illustrated book on all the ways to exercise while doing a dead hang (plus all the ways to do pull-ups): *Raising the Bar — The Definitive Guide to Bar Calisthenics*. It is available from www.DragonDoor.com.

If you have come this far in the book, you should have enough information to begin the exercises. The remaining pages of the book are devoted to **my theory** as to how and why “**hanging from an overhead support**” and **simple weight lifting** solves and prevents most shoulder problems.

PART 2

KIRSCH PROTOCOL THEORY

**Hanging Stretches the CA arch
Expanding the Subacromial Space**

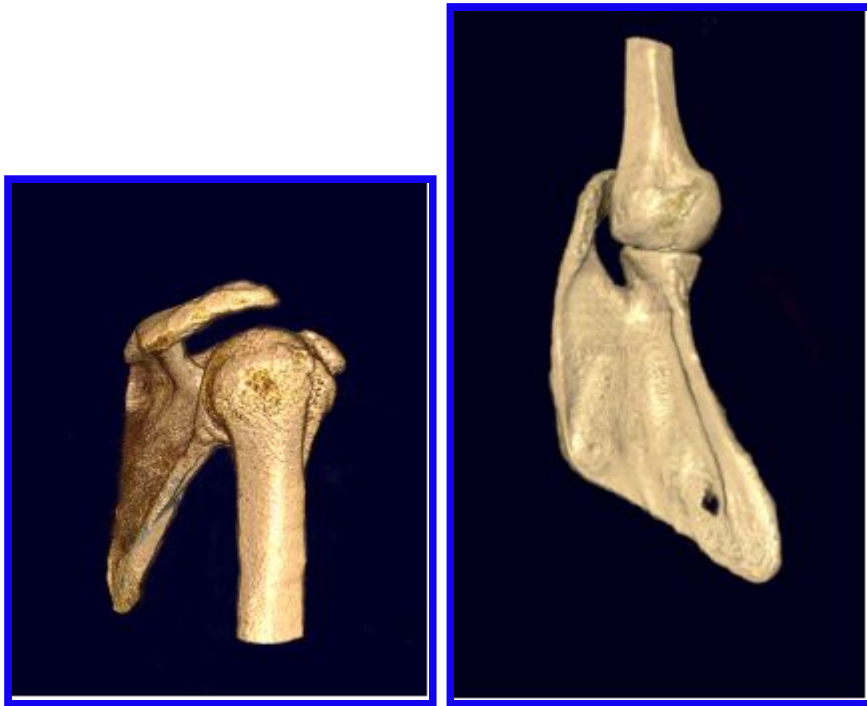


The Shape-Shifting-Shoulder

The anatomy of the shoulder is complicated and made more confusing when the position of the arm is changed. During the hanging exercise, the relationship between the arm (humerus bone) and the shoulder blade (scapula) changes. When the arm is raised fully the CA arch no longer covers the rotator cuff that moves to a position behind the CA arch, and the dense bone of the upper arm bone (humerus) comes to a position well suited to lift and apply a bending force to the CA arch.



Fig. 27 This image was created by superimposing two CT images: one with the arm at the side, the other in the hanging position. The dark grey shoulder is in the anatomic position, arm at the side. The light grey shoulder is in the hanging position. The arm rotates 180 degrees, the shoulder blade only less than half as great an arc. Once the arm is elevated above the horizon, the rotator cuff is no longer beneath the CA arch. In both CT images, the CAL ligament has been added by the artist.



Figs. 28 & 29 CT scan images. Notice the scapula rotates thru an arc less than the humerus. The size of this arc of motion is difficult to demonstrate in the two dimensions of this page. The 3D video imaging is considerably more descriptive. These videos and images are available at www.kirschshoulder.com.

Because of the difficulty in demonstrating the shoulder anatomy in two planes as in the book, the following series of images (on the next page) have been captured from a CT scan 3D volume file of a live 40 year old female subject while simulating hanging. The images have been captured from the rotating skeleton without editing out the thoracic elements to allow complete visualization of the shoulder/thorax relationships.

The “video” as presented here is rotating in a counter-clockwise direction as viewed from above. The images on the next page are intended to be viewed as a single continuing image file. “Read” the images from left to right as in reading text. Or, picture yourself walking around the skeleton in a clockwise direction. To see this video online, go to: www.kirschshoulder.com

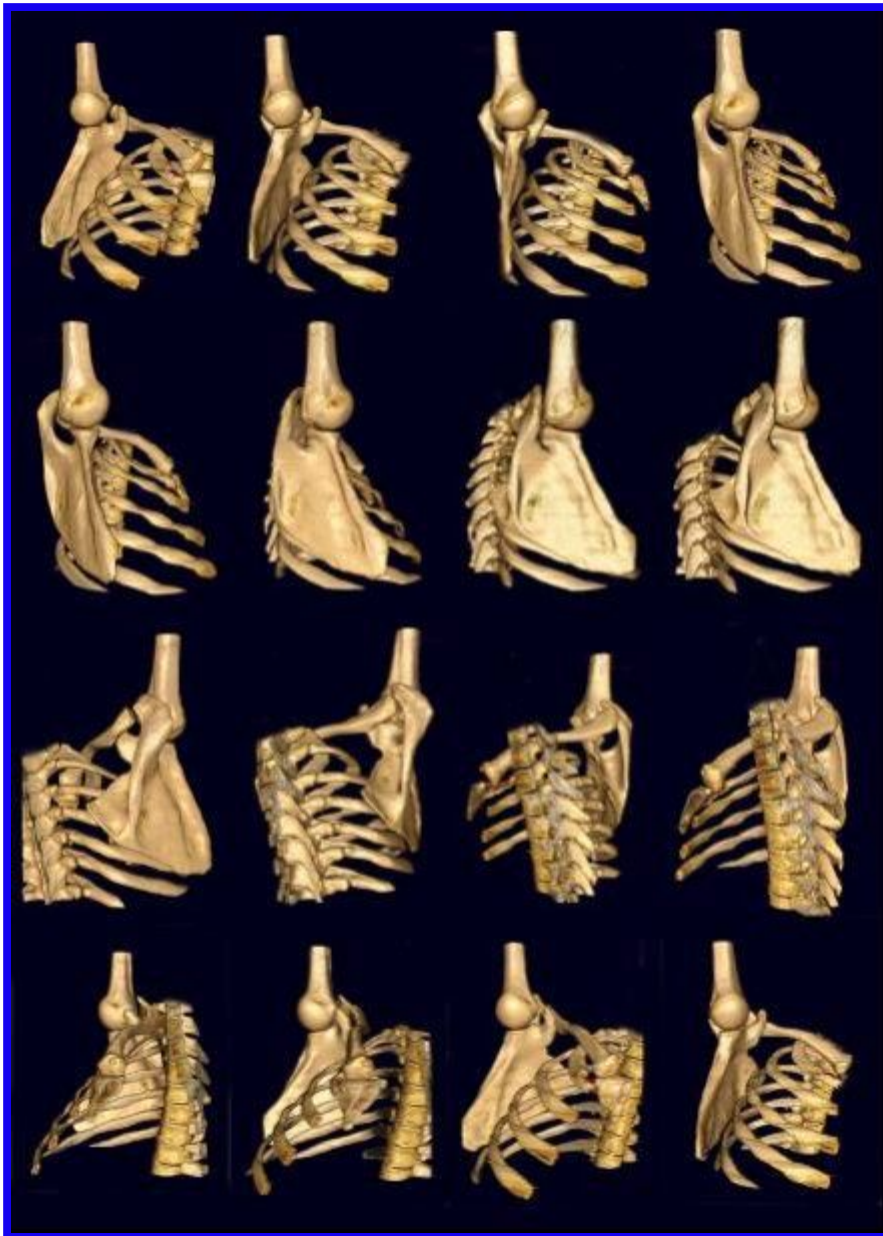


Fig. 30 The rotating skeleton with the shoulder in the hanging position taken from a CT scan.

The Humerus and the CA Arch

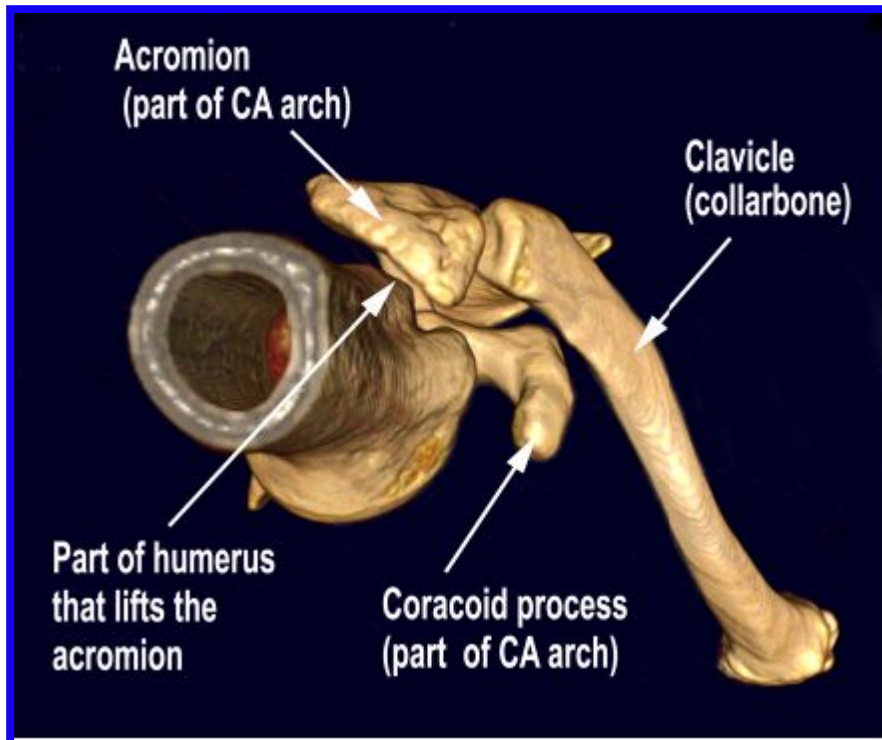


Fig. 31 This CT image was made with the subject in the hanging position. The view is from above the right shoulder with the subject facing the viewer. The CT image was manipulated to best view the CA arch. The CAL ligament part of the arch is not shown here.

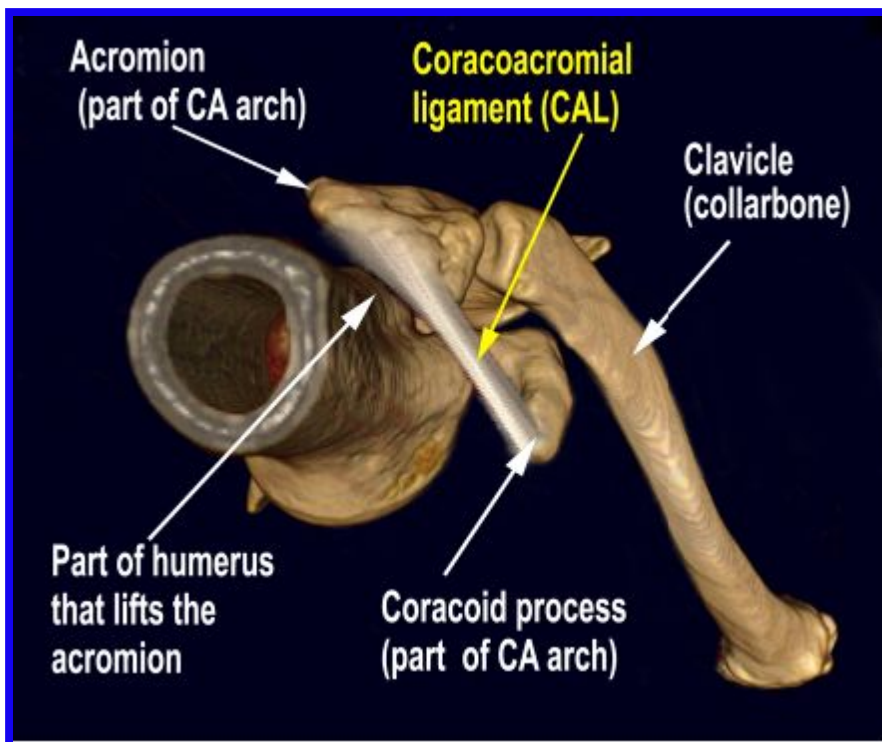


Fig. 32 This image is the same as in Fig. 31, but has had the CAL (coracoacromial ligament) part of the CA arch **painted in by the artist**. The view is of the right shoulder from above in the hanging position with the subject facing the viewer. Note that the humerus is well positioned to lift both the acromion and the CAL parts of the CA arch. The CAL (ligament) covers the undersurface of the acromion to provide a gliding surface for the humerus as it lifts and bends the acromion with overhead arm motion.

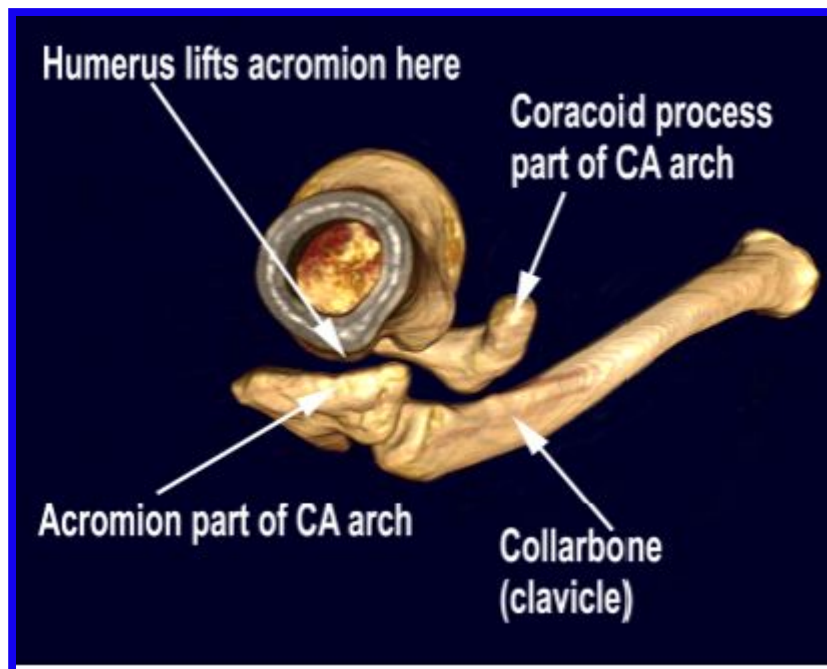


Fig. 33 This image shows the appearance of the left shoulder viewed from above in the hanging position with the subject facing forward, the back to the viewer. The image is taken from a CT scan study of a normal subject holding a 60 lb traction weight overhead to simulate the hanging position. Most of the humerus bone has been removed showing only the upper part of the humerus that presses on the acromion bone part of the CA arch. The ligament part of the CA arch (the CAL) has not been added to the image. Notice where the humerus bone nearly touches the acromion bone. There are some soft tissues in the small space between the humerus bone and the acromion part of the scapula. This space constitutes the acromiohumeral joint.

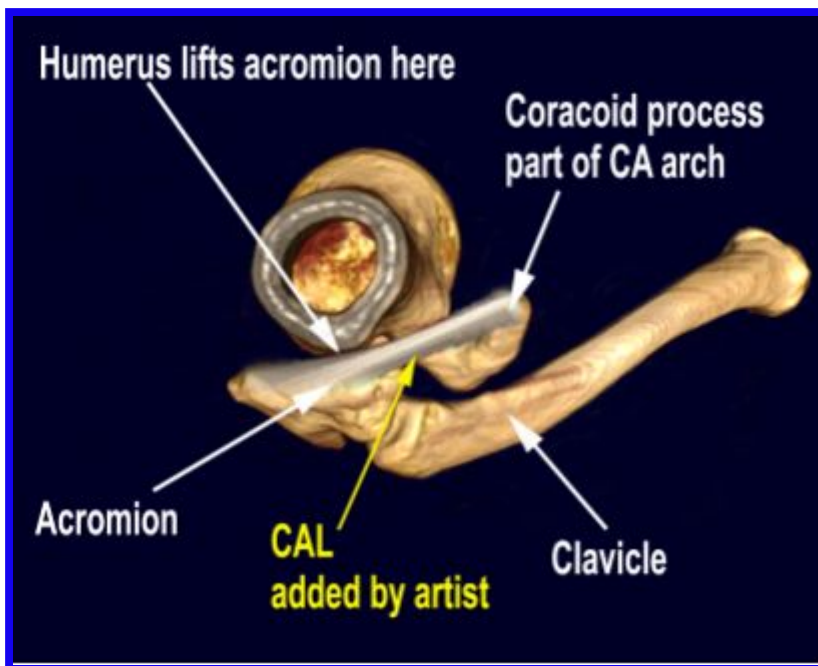
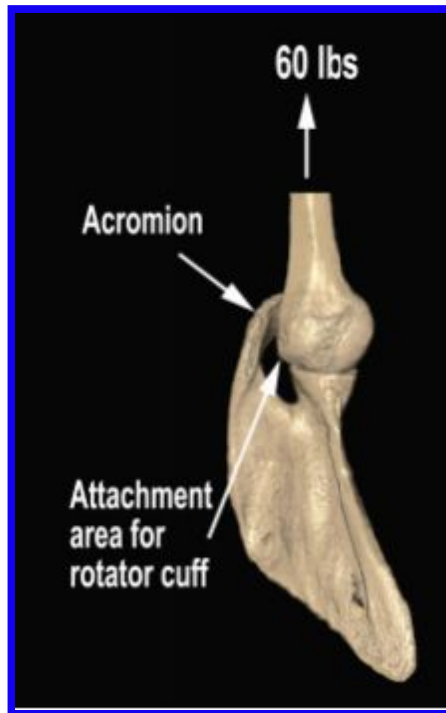


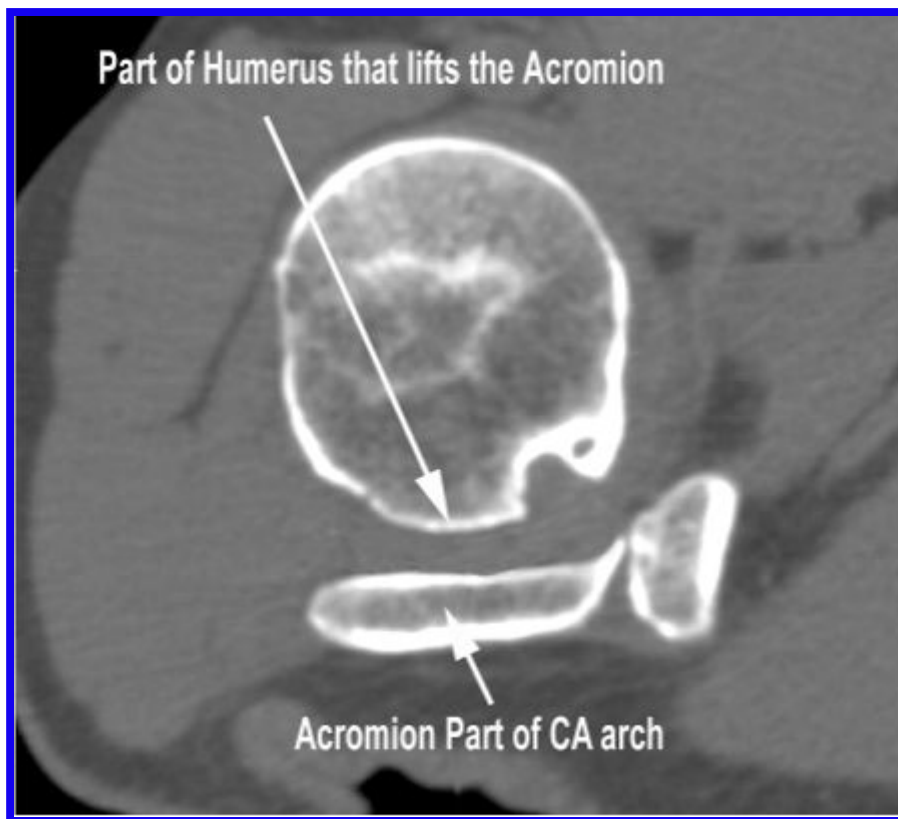
Fig. 34 This is the same image as on the previous page but with the CAL ligament part of the CA arch **added by the artist**. The view is from above the left shoulder with the subject facing forward with his back to the viewer. The CAL (ligament) connects the acromion and the coracoid process completing the CA arch. During the hanging exercise, this ligament is stretched along with the rest of the CA arch. The CAL has a broad insertion on the undersurface of the acromion that may well serve as a lubricating surface when the acromiohumeral joint is engaged with arm elevation or hanging from an overhead support. In fact, studies of the CAL tissue have found that the ligament inserting on the acromion has some of the properties of joint cartilage.

Rotator cuff



Figs. 35 & 36 Two images of the shoulder in the simulated hanging position with the subject holding a 60lb weight. On the left is the 3D image, on the right the sagittal or vertical 'slice' image selected for optimal viewing of structures. Note how the humerus bone is positioned to **bend the acromion** part of the CA arch and the safe relaxed position of the rotator cuff tendon. The horizontal

or axial images in **Figs. 37 & 38** below were taken from the level indicated by the horizontal white reference line. The CT scans of the live subject simulating the hanging position are a good deal more accurate than a cadaver demonstration. A cadaver demonstration would require removing many ligaments and muscles that act on the significant structures being studied.



Space ???



Fig. 37 This is an axial or horizontal 'slice' image made of the left shoulder in the hanging position. The level of the slice is referenced in **Fig. 36** by a horizontal white line. The subject faces away from the viewer. The view is from above. Notice the space between the humerus bone and the acromion part of the CA arch. This space is occupied by tough ligament tissue and parts of the bursal sac that eases the motion between the humerus and the CA arch.

As mentioned earlier in the book, the bursa sac beneath the acromion would be discussed. The subacromial bursa is a thin walled empty pouch-like structure that helps the humerus

bone and the overlying acromion bone glide smoothly when the arm is raised. In the image below, **the bursa and the CAL ligament have been painted in by the artist** to show their position.

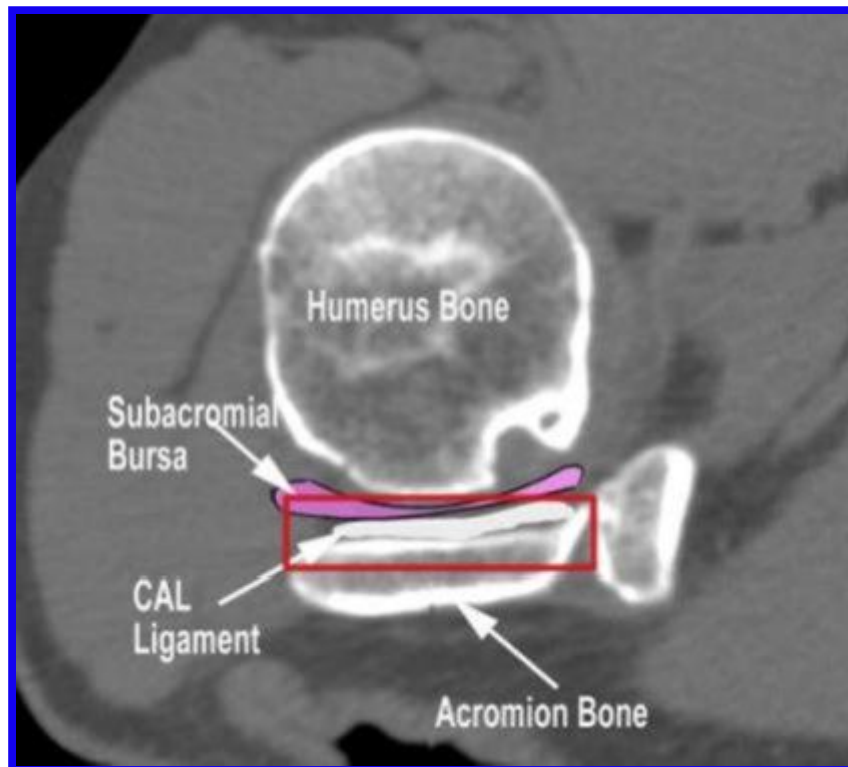
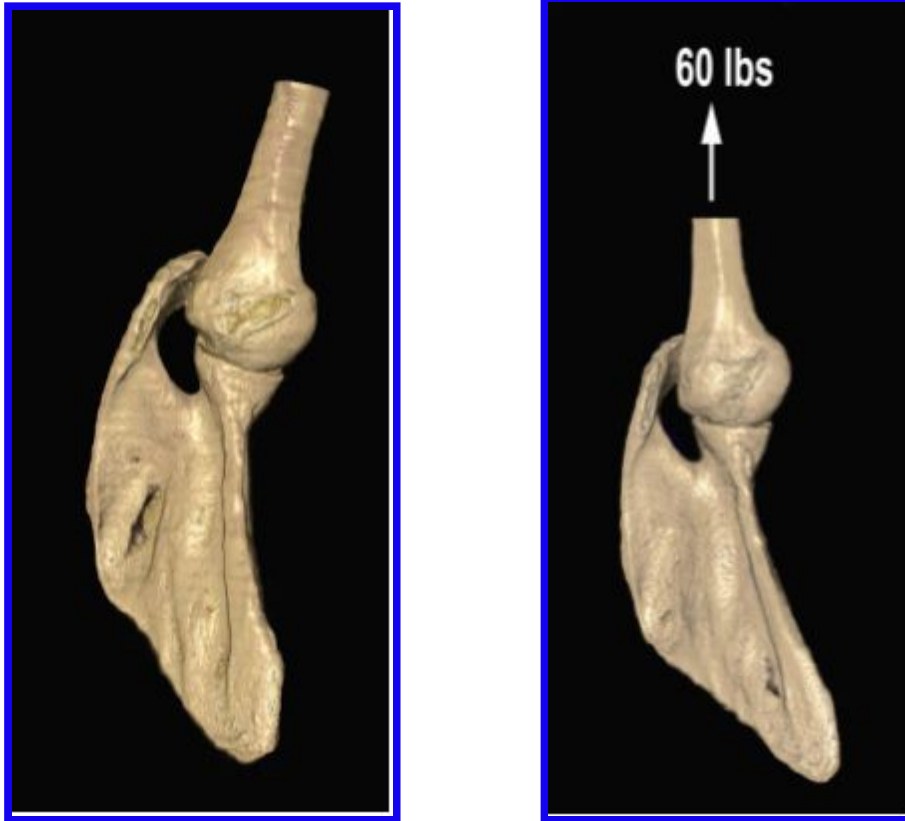


Fig. 38 The same slice image as in **Fig.37**, but with the bursa and ligament tissue **painted in by the artist**. The view is from above the left shoulder in the hanging position with the subject facing away from the viewer. Although these tissues are compressed during the hanging exercise, this causes no harm as these tissues remodel along with the rest of the CA arch. These two tissues, the coracoacromial ligament (CAL) and the subacromial bursa provide the lubrication necessary for the smooth functioning of the acromiohumeral joint. The tissues inside the red rectangle are excised when you have a subacromial decompression surgery (SAD). This surgery removes the most important parts of the acromiohumeral joint. The view is from above the left shoulder in the hanging position with the subject facing away from the viewer.

Arm Elevation vs. Hanging

Although full active arm elevation helps to lift the CA arch, more complete arm elevation is accomplished by hanging.



Figs. 39 & 40 3D CT images. On the left is an image with the subject actively elevating the arm with maximum effort. The view is from the side of a right shoulder. On the right is an image of the shoulder with the arm elevated passively (thus simulating the hanging exercise) by having the subject hold a 60lb weight. Note the more complete elevation in the traction image. It is this stretching position that applies a reshaping or remodeling force to the CA arch.

The Forgotten Joint

In the Days of the Caveman

Recently I had the happy accident of stumbling across an old cassette tape; one of my children's favorites that rubbed off on me some twenty years ago. It was the Crash Test Dummies, an alternative rock band from Winnipeg. I listened a while and then, as if by magic, the lines to their tune "In the Days of the Caveman" came ringing into my ears: "...see in the shapes of my body, leftover parts from apes and monkeys ..."

There it was. The Crash Test Dummies had unwittingly pointed us in the right direction in the '90s!

They weren't the only ones. More than 20 years before that, in the fall of 1970, The Kinks sang of man's evolution in their song "*Apeman*", noting: "...the only time that I feel at ease, is swinging up and down in the coconut trees."

Those who study the history of man (anthropologists) are fairly certain that ancestral man was a creature that spent much of his time in the forest and would be considered "arboreal." That is to say that they did a lot of climbing and hanging from tree limbs. At some point in the very ancient past, they also walked on all four limbs, or were "quadrupedal." Many experts also agree that we have paid a price for getting up on two legs. Inguinal hernias and lower back pain may be the result of our biology having not kept pace with civilization's social progress. Social evolution follows a Lamarckian mode of evolution: fast and direct. Human anatomy follows a Darwinian mode: agonizingly slow,

indirect and random. Civilization's progress has gone from rocks to silicon chips in a few thousand years. It will require millions of years for our anatomy to catch up with our social progress.

Although there have been some investigators who have studied the shoulder and its similarity to other primitive human-like creatures, less is said about the price we have paid for coming down from the trees. Decreased overhead use of the arms may be related to the current epidemic of shoulder degenerative disease.

The usual presentation of shoulder anatomy mentions one joint, the glenohumeral joint, or the ball and socket shoulder joint. A skeletal joint, or articulation, may be defined as: **“a joint or juncture between bones or cartilages in the skeleton of a vertebrate; or a movable joint between rigid parts of an animal.”** (*Merriam-Webster Dictionary*).

Clearly, from the CT scans made for the investigation of the hanging exercise, there is another articulation in the shoulder equal in importance to the glenohumeral joint. It is the movable articulation that occurs between the upper humerus bone cortex and the acromion, the **“acromiohumeral joint.”** It is what I call a “part time” joint. The articulation is engaged only with overhead arm activity or while hanging. It is responsible for maintaining the normal functioning of the shoulder anatomy between the humerus and the scapula.

It is the pressure applied to the coracoacromial arch (specifically the acromion and the coracoacromial ligament, the CAL) by the humerus with repeated overhead arm activity as well as by a hanging exercise that engages the

acromiohumeral joint, and maintains the integrity of this joint and the space for the subadjacent structures such as the rotator cuff, the subacromial bursa and the concentric function of the glenohumeral joint

The anatomy of the shoulder is nearly always presented as in the images below:



Fig. 41 X-ray



Fig. 42 Skeleton



Fig.

43 CT scan

This common presentation of the shoulder prevents us from having a more complete understanding of the shoulder biomechanics. On the next page are images of the shoulder in the simulated hanging position.

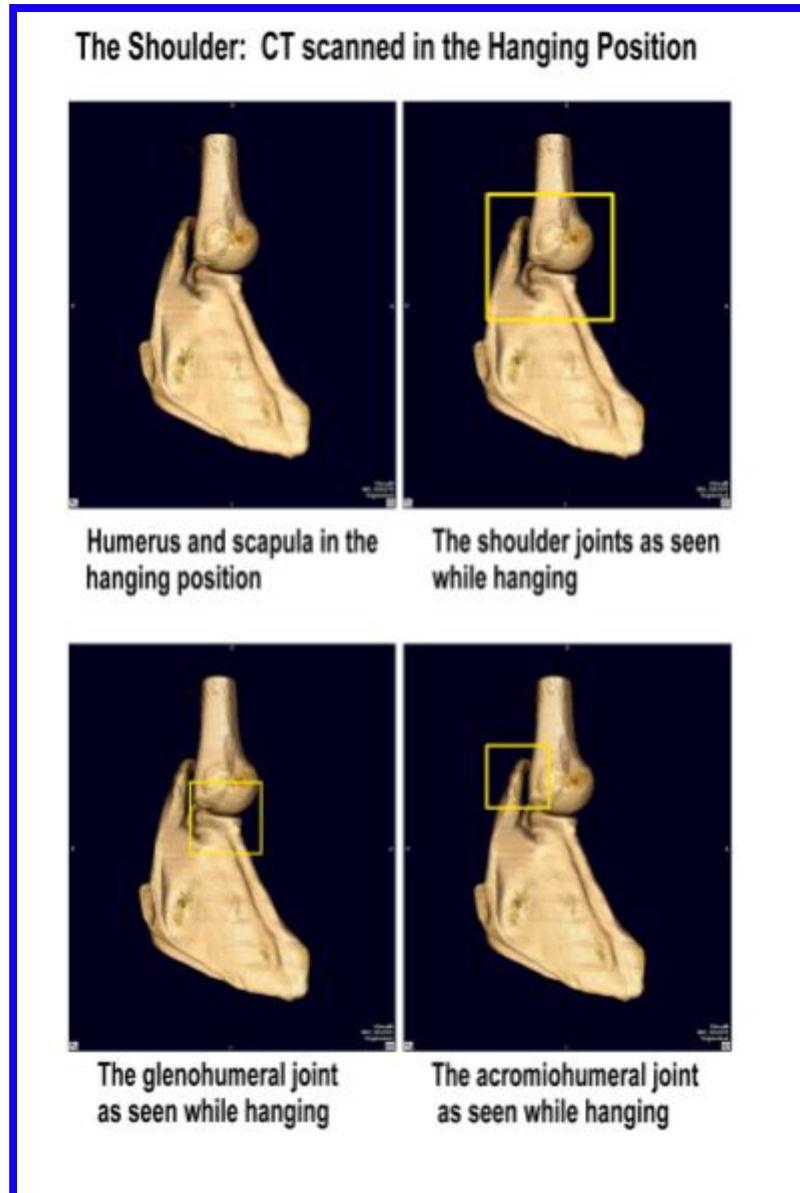


Fig. 44 The two components of the shoulder: the glenohumeral joint and the acromioclavicular joint.



Fig. 45 The “Forgotten” acromioclavicular Joint: A new and important joint in the human shoulder.

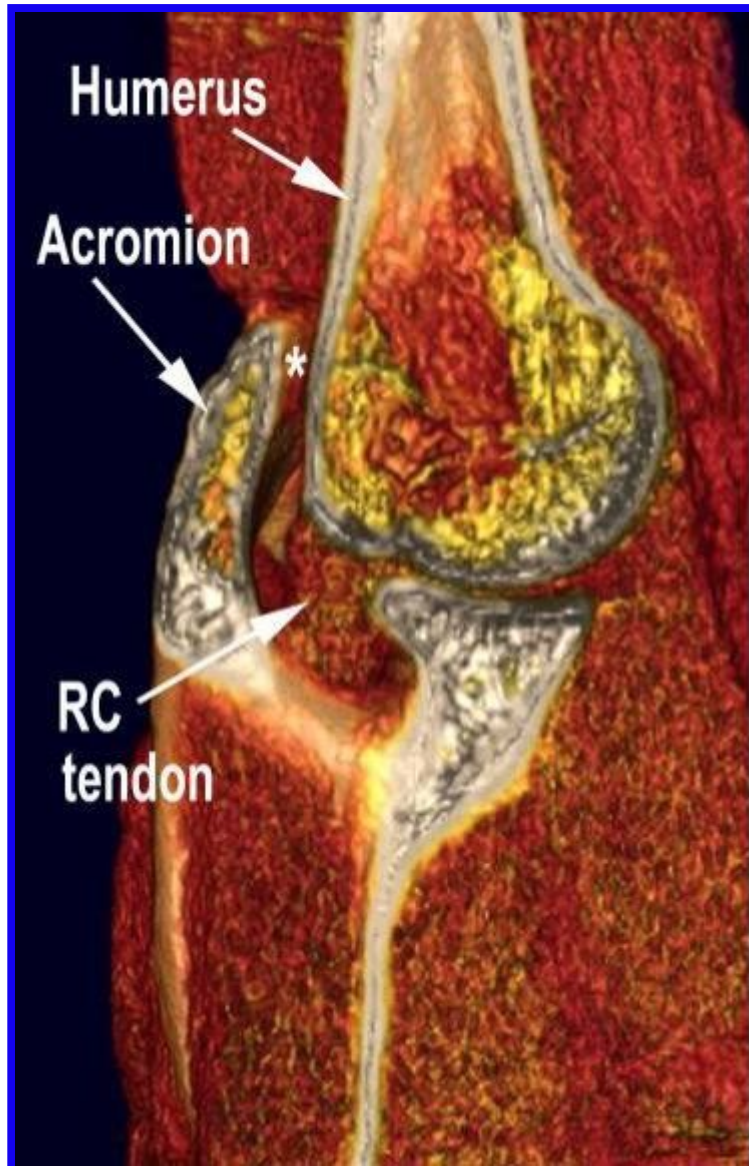


Fig. 46 * The Acromiohumeral Joint. Image taken from a CT scan of a normal 40 year old female subject while performing the simulated hanging exercise. Note the safe position of the rotator cuff tendon (RC) and how the humeral bone engages the acromion. There are soft tissues in the interval where the asterisk has been placed. These soft tissues lubricate the acromiohumeral joint.

Finding the CAL

Imaging the coracoacromial ligament with scanning equipment is exceedingly difficult. The ligament is quite thin, made of soft tissue and lies in an oblique plane. Most CT scan files saved in radiology facilities save only the vertical and horizontal “slice” images. However, using more powerful “Volume” or 3D digital imaging programs, it is possible to rotate and digitally dissect the skeleton and soft tissues. The images on the next two pages exhibit the results of my search for the CAL.

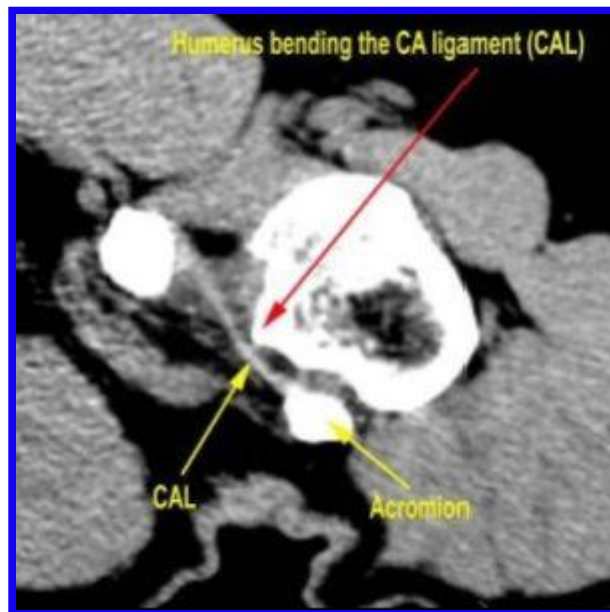


Fig. 47 This slice image was taken from a CT scan study of the subject’s right shoulder in the simulated hanging position. The coracoacromial ligament (CAL) was found in its oblique plane along with the image of the humerus as it presses on and stretches the ligament during the hanging exercise.

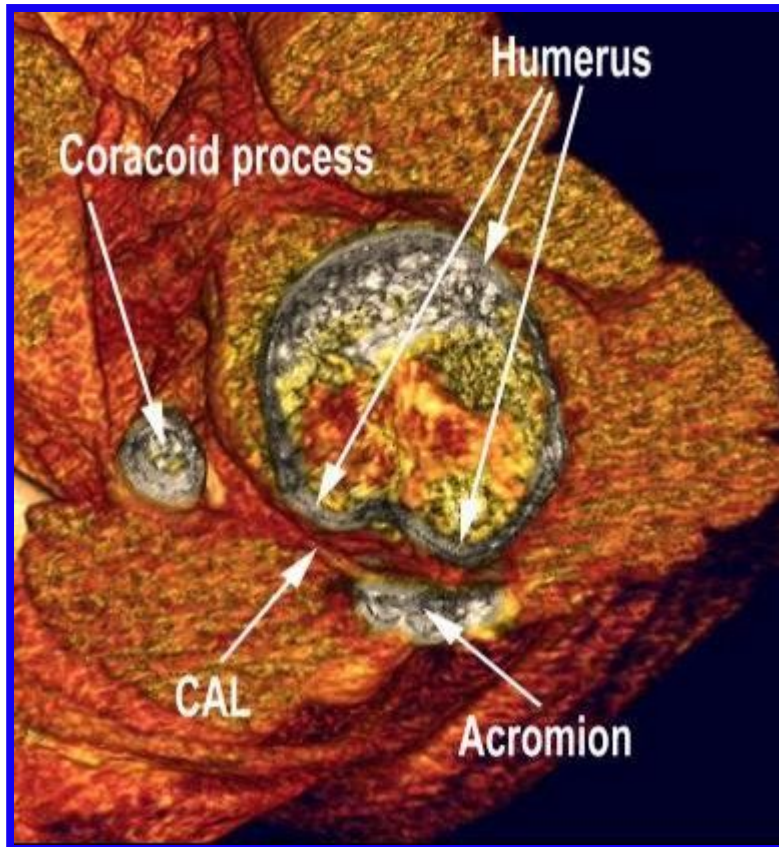
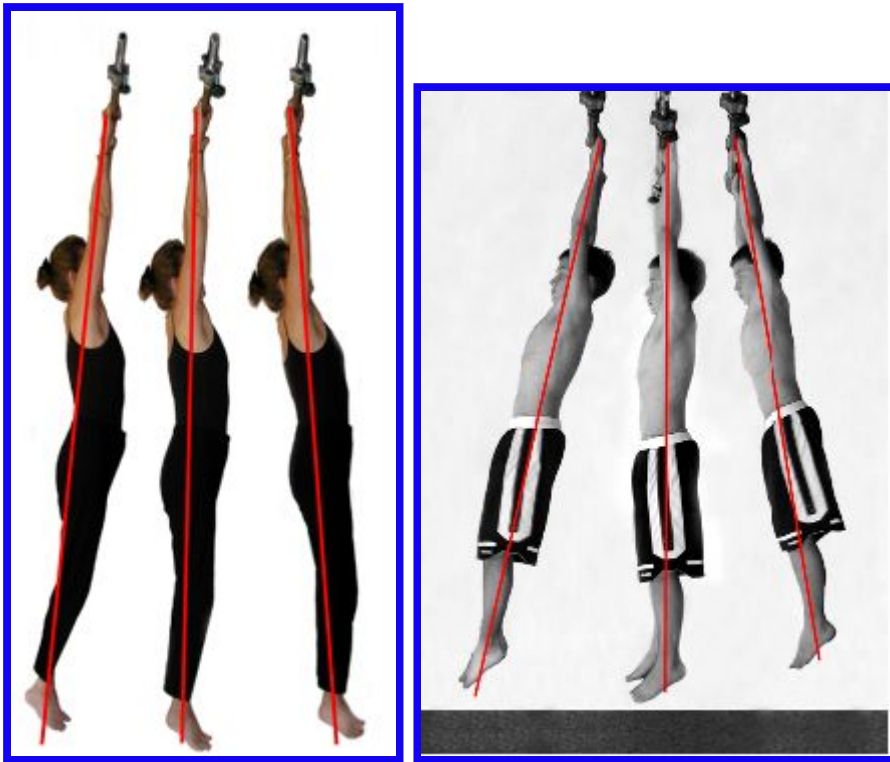


Fig. 48 This slice image was created from a CT scan of a normal subject in the simulated hanging position. The CT editing program was set to show soft tissues and the volume image was cut in the plane of the coracoacromial ligament (the CAL). Note that the humerus bone in the hanging position is well positioned to stretch the adjacent coracoacromial ligament (CAL) and the acromion. As the ligament part of the arch is soft tissue and seen in a cross section, it is quite difficult to capture with x-ray (CT scans) technique. Yet with careful digital dissection of the scanned image as you see here, it is possible. It would be extremely difficult for a subject to support the 60 lb traction long enough to capture an MRI scan (45 minutes). The CT scan imaging requires only about 30–45 seconds.

The Human Pendulum

The slight oscillation, or swinging that occurs when a person steps off a small stool to reach and hang from an overhead bar, might lend the idea that there could be over-rotation within the shoulder that could cause damage to the rotator cuff. Over-rotation could cause **“internal impingement”** of the rotator cuff. However, the human skeleton acts as a “chain pendulum” while hanging. The only “joint” that can rotate in a chain pendulum is the top axis or point of support. Thus, the wrist, or the top joint in the human chain pendulum is the only joint that can rotate while hanging from a bar. **It is nearly impossible for “over-rotation” to occur in the shoulder while hanging from an overhead support.** This effect is seen in the figures on the next page.



Figs. 49 & 50 The human pendulum: These images were composited from separate photos taken at separate moments during intentional exaggerated swinging of the subjects as they performed the hanging exercise to demonstrate that the only joint rotating while hanging is the wrist. **It is nearly impossible for over-rotation of the shoulder to occur while hanging from an over-head support.**

The simplest example of a chain pendulum may be constructed by the reader using a number of paper clips joined and supporting a small weight: any small weight will do. Then place the paper clips hanging from a pencil tip or small hook and let your “chain” of paper clips oscillate. You will find that the only rotation takes place at the hook or pencil support. The same would be true of a child’s swing using chain supports.

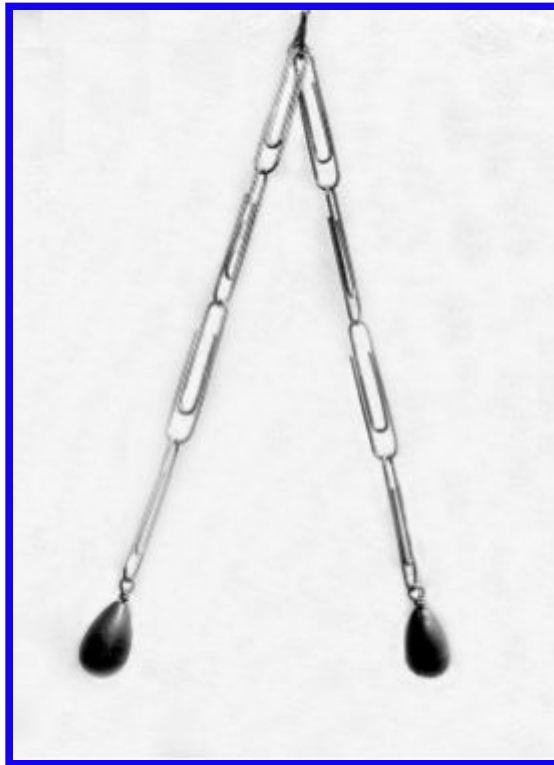


Fig. 51 A chain pendulum constructed from paper clips.

Reshaping the Acromion Part of the CA Arch: Artist's Renderings

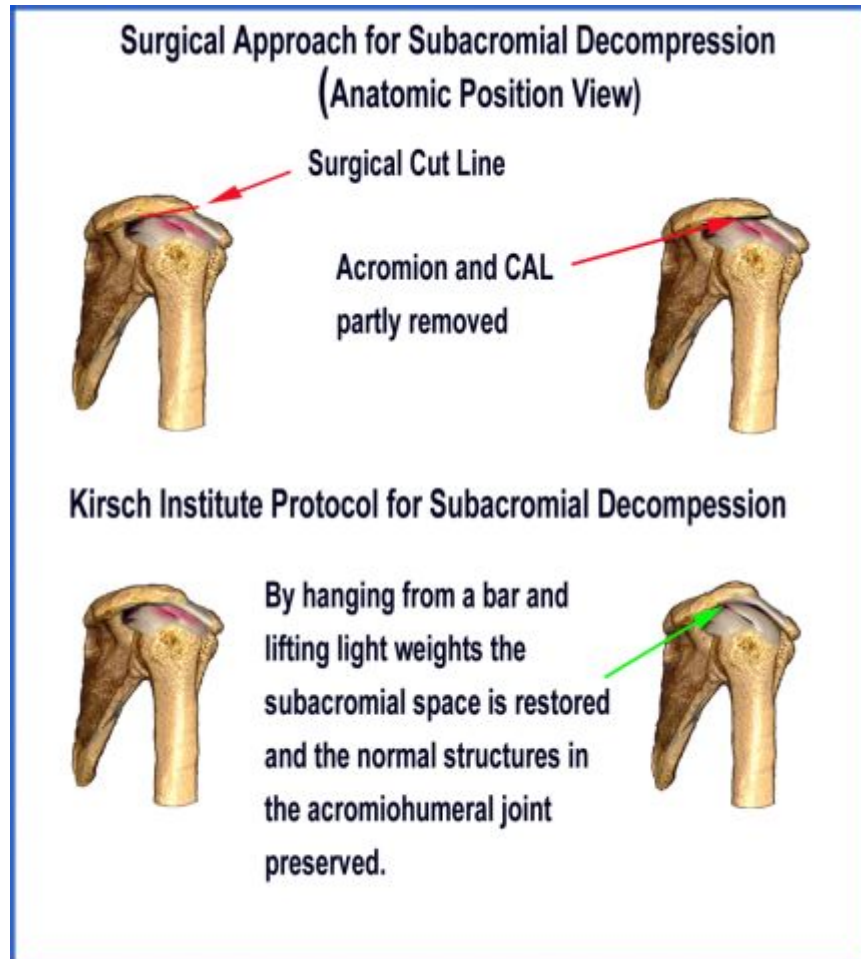
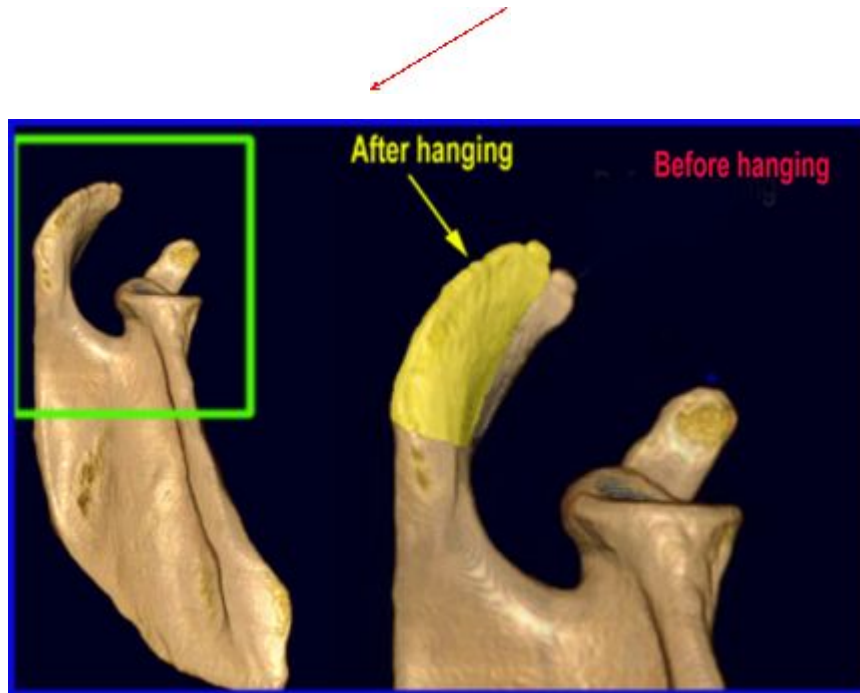


Fig. 52 A view from the side of the shoulder in the arm at the side (anatomic) position. This is an **artist's rendering** overlaid on actual CT scan images. One can see that the shoulder anatomy remains intact using the hanging and weight lifting exercise protocol.



Figs. 53 On the left is a CT image of the scapula alone taken from a CT scan with the subject simulating the hanging position. On the right is the author's conception (**artist's rendering**) of how the flexible acromion may be bent by the force of gravity to gradually remodel providing more room beneath the CA arch for the rotator cuff. The acromion tip after remodelling is depicted in yellow. You can have this part of your acromion bone removed surgically, or you may be able to reshape your own acromion by hanging.

When a person hangs from an overhead support they are not only stretching the CA arch. There are many other ligaments, muscles and joints of the shoulder and between the shoulder and the thorax that by their very position in the human body must be stretched to their limit while hanging. This list is presented here for those with an “appetite” for detail and the science of the hanging exercise:

- The sternoclavicular capsule and ligaments:
 - o costoclavicular ligaments, the subclavius muscle and the clavipectoral fascia
- Between the scapula and the clavicle:
 - o the coracoclavicular and AC joint capsule and ligaments
- At the scapulothoracic interface:
 - o the pectoralis minor, serratus anterior, rhomboid, and lower one-half of the trapezius muscles and the intramuscular septae of these muscles.
- At the thoracohumeral connection:
 - o the latissimus dorsi and pectoralis major muscles
- At the scapulohumeral joint this force stretches:
 - o the anterior, posterior and inferior glenohumeral capsule and ligaments; and the subscapularis, teres major and minor, long head of the triceps, biceps and portions of the highly

pennated anterior and posterior deltoid muscles and their intramuscular septae.

□ and all aponeuroses and investing fasciae of the above-mentioned muscles

In addition to these structures of the shoulder girdle, the intervertebral disc elements of the thoracic and lumbar spine are provided with a traction force while hanging. This traction is probably beneficial.

Further discussion of these structures is beyond the scope of this book. However, it is worth mentioning that using 3D CT imaging software to view and edit the CT scans, it is possible to appreciate the effect of the simulated hanging exercise on these structures. All of the tissue mobilization that occurs while doing the hanging exercise is beneficial as it is a **normal human activity**.

Again, Video clips of the CT scans made during the research for this book showing the rotating shoulder in the hanging position, with and without muscles and ligaments, and many other full color images taken from the CT scan studies are available for those who are interested in using the material for teaching or further study. To view these videos and images, or to comment on the hanging exercise, go to www.kirschshoulder.com.

Therapists and Physicians can provide many helpful treatments for your shoulder. But only you; doing the exercises presented in this book, can reshape and strengthen your own shoulders to recover and maintain painless normal shoulder activity.

All people, both young and old, should do the exercises regularly to keep their shoulders healthy and prevent the deformities that lead to shoulder pain and injury.

Hanging bars should be installed in many public places for all people to restore and maintain the health of their shoulders. Look around for an object to hang from: it won't be an easy search!

Hanging bars should be available in airport lounges, train stations, every park & playground. Such readily available equipment would go a long way in solving the shoulder pain healthcare crisis.

Man is a true brachiator. If you are a human being, you must brachiate; or, you must at least simulate brachiation by frequent hanging from an overhead bar and lift light weights to a full overhead position to maintain the health of your shoulders.

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[1] **Wolff’s law** is a theory developed by the German anatomist and surgeon Julius Wolff (1836–1902) in the 19th century, which states that bone in a healthy person or animal will adapt to the loads under which it is placed.

[2] Many persons are unable to do a full body hang keeping the feet from touching the floor or stool. These people may use the “partial weight” hanging technique (see next section) that will provide the same benefit for the shoulder. The only difference is that this mode of hanging cannot offer traction to the spine that is also beneficial.