

Bone Forging

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1.

Introduction

This paper is an exploration of "Bone Forging". I use the term "Forging" for lack of any better word and because I found no other term for it in my research into the subject. In talking with the orthopedic residences at CU Medical Center, I discovered that there is medical precedence for the concept, first proposed by one Dr. Wolff, which has since become known as Wolff's Law. The law states that wherever bone is stressed it becomes thicker and harder, and wherever is is not stressed, it becomes weak and thin. This concept along with Sheehan Niomiya's shin break demonstration at Sabaki, formed my initial interest into this subject. Although this paper will cover a wide variety of Forging methods, it is in no way covers all the possibilities.. Many of these technics were practiced for centuries prior to Dr. Wolff's law as part of the martial arts training process in many different styles. Although much of my research indicates that the Shaolin style of China might be credited with originating the practice, it should be noted that many other styles claim credit and I was unable to come to any firm conclusion. Origins aside, Bone Forging exercises can be an important part of any Martial Arts regimen and the following is offered only as a glimpse into the topic. It should also be noted that my reference sources are not footnoted. Therefore, I want to stress that none of the technics listed represents any original thought on my part, but were instead picked up in a very piece meal basis through movies, books and videos over time. I simply cannot remember the sources to which credit is owed.

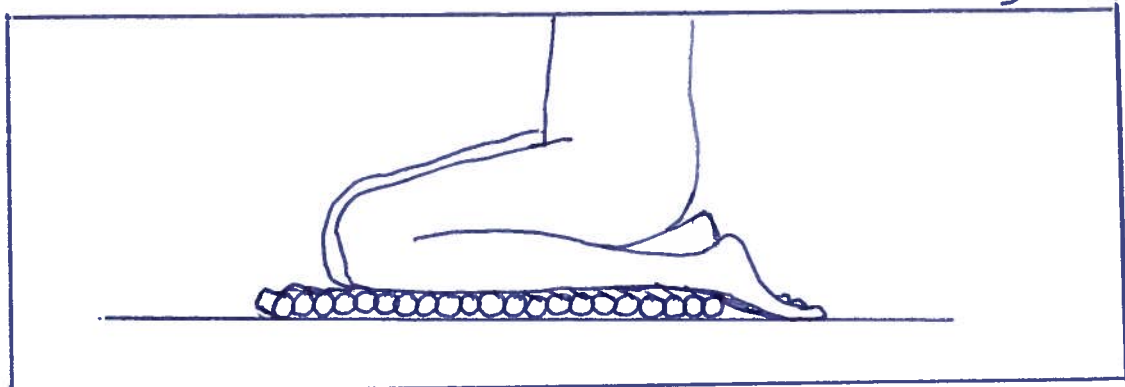
The Shin

I chose to start with the shin bone (Tibia) because I like it best. Other than the femoral head (knee), it is the largest bone in the Martial Artist's arsenal. It is also the most distal bone, second only to the foot itself. As most people know, the longer the radius of an arc, the greater the velocity created - given the same RPM. In addition, force is equal to mass times velocity. Therefore, the shin truly represents the most forceful weapon available - in my opinion. The weakness of the shin is in the fact that there are so many nerve endings along the striking surface and that the bone itself is so close to the epidermal surface. Everyone has run into a coffee table sometime late at night and experienced the incredible pain associated with what really is a minor amount of force. The challenge then is how one can strengthen the surface and increase the mass of the striking bone to overcome this obstacle and feel confident with using it in a fighting situation.

To increase the mass of the bone itself, one must create stress along the surface of the bone. The most useful technic I came across for this purpose was the idea of a mat made of wooden dowels. Here again, I am unable to give proper credit to the source, but the concept is quite simple. The idea is to start with a small diameter wooden or metal dowel. Cut to an appropriate length and lay side by side on a flat hard surface. Then kneel across the surface of dowels. The flat surface of the shin bone will articulate with the top of each dowel and create stress risers along the surface of the shin. (see Fig. 1)

2.

Fig. 1



The smaller diameter dowel should be used first because the weight over the bone will then be spread over a greater number of surface contact points. This will create less stress initially and make for an easier progression. Over time, the diameter should be increased to reduce the number of contact points and increase the amount of stress to the bone. With more time, you can remove dowels one by one until you are kneeling on just three or four dowels.

Progression occurs by increasing the length of time spent kneeling. I recommend using this time to strengthen your meditative skills as well. Practice breath counting for example and increase the number of breaths you take at each session. In my own experience, I was unable to stand more than the count of ten in any given session to start with. I recommend doing sets of three sittings in a day. Then, depending on the tissue damage, take two to three day off and use Dit Da Chow liniment liberally.

The same results can also be accomplished by kneeling on a bed of gravel and varying the size of stones used. In fact, the gravel may be superior for several obvious reasons, but is not nearly as practical for in-home use. Finally, it should be noted that some practitioners will experience unacceptable levels of pain with any size dowels or gravel, due to their own personal sensitivities. For those cases, I recommend rolling a cylindrical object up and down the shin from a seated position in a chair. (ie. a pop bottle, broom handle, etc.) Here again, increase the time spent each session until you have desensitized the area enough to begin kneeling.

The other half of Bone Forging is the strengthening of the surface of the shin itself. Here, one is trying to cause the formation of calluses or a thickening of the skin itself. This will have the effect of deadening the nerves endings by increasing their distance from the epidermal surface. I draw an analogy here to walking bare footed at the beginning of each summer when you were a child. After spending all winter in shoes, your feet were sensitive at the beginning and every little rock or pebble you stepped on was uncomfortable and you found yourself walking on tip toe. Pavement seemed very hot and you had to adapt your gait so you ended up looking like a chicken running across the pavement to get to the pool. By the end of the summer, the pavement didn't seem to bother you and your gait returned to that of a normal walk.

The shin is not normally in contact with any rough surfaces on a regular basis, nor is it regularly exposed to heat. So causing calluses to the skin over the shin takes some creativity. One of the best ways of doing this can be accomplished with repeated beatings or pounding.

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When working out on a heavy bag for instance, make sure you spend time using shin kicks. Increase the number of kicks on each side at each session until you reach a real comfort level with this kind of kick. Strike with all angles of the shin by using not only the round house version, but also an inside-out and outside-in crescent version. This way you will cover all the possible striking areas. Also vary the part of the shin you strike with. In other words, strike from very close to the knee and move down the leg toward the foot, as you change through each kind of kick. Canvas bags have a coarser surface and will help expedite the process for that reason. Muay Thai training uses a longer, narrower bag filled with gravel for this purpose. To increase the effect of beatings, try to move up to more rigid surfaces. I had a tire nailed to my tree for instance. Try kicking the tread of the tire until you can buckle the tire with each kick. You should find this surface a lot less forgiving and with time it will surely toughen the skin over the shin. I have also read about Makiwara training with a tree. Practitioners wrap rope around a tree in layers over a purposed striking area and commence to kick it. With time they gradually reduce the layers until they can kick the tree itself. I myself have not reached this level of comfort, but I can certainly see the practical value of Makiwara training.

Martial Arts is full of similar ideas for the formation of calluses. Some of these appear to be simply bizarre to potentially dangerous. Some styles use sand heated over a fire, boiling water, hot wax or even hot coals themselves. The bottom line here is that controlled exposure of skin to hot surfaces causes the skin to thicken and harden. In some styles the intent is to actually cause permanent damage to the nerve endings themselves. Personally, I cannot see how this extreme a practice could ever be justified. However, history is full of extremists. One must use one's own common sense and realize that years of practice may have lead up to such ability. Never plunge yourself into something that appears dangerous to your own well being. Instead, get advice from someone who is already getting the results you seek and mimic their routine. Certainly there can be no gain without some amount of pain, but exercise patience and good sense before jumping into boiling water.

Foot & Hand

Feet and hand training are quite similar to each other as far as I am concerned, in that they share similar placement of bone. To increase the mass of bone, first consider the striking areas you intend to use.

With the hand, you can use several striking surfaces - each with separate needs to consider. You can use the finger tips, the thumb, the knuckles, the knife edge, the ridge hand, the back of the hand or the palm of the hand. Here again, I apologize for my inability to provide specific references, but I will attempt to address at least one technic for each concern.

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There are no limits to the numbers of methods you might devise on your own. The only factor to remember is that in order to increase bone mass, you must stress the bone. In our shin, we used our own body weight as a catalyst and suspended that weight over a series of contact points along the shin. The hand will require the same phenomenon to take place.

Most traditional schools of martial arts have their students perform knuckle push-ups. Here again, the body's own weight is suspended and concentrated over contact point - in this case the knuckles. Many practitioners focus on just the first two knuckles, because of their individual styles. However, many Chinese styles, particularly Kenpo, use all the knuckles in a raking motion for certain strikes. Therefore, it is recommended that you attempt to roll the weight across all your knuckles when forging is your goal. It should be noted that the metacarpals and carpals bones will also be effected in this load bearing effort. Focusing on the knuckle of the little finger then, will also improve the mass of the knife edge striking bone. Push-ups themselves are not necessary to create forging, but rather it is suspending the weight for extended period of time from a push-up position. The thumb and fingers can be forged from this position as well by suspended the body weight from a fingertip push-up position. Like the shin, progressive forging can be achieved in a bed of gravel or on asphalt, etc. As your strength increases, try knife edge push-up position and progress to the use of small diameter dowels or gravel as the underlying surface. The Ridge hand represents a unique problem in that it does not lend itself to a push-up position form of stressing. Here, you might try sitting at a desk and placing the ridge hand striking surface under the lip of the table/desk top in front of you. Lift up the end of the table/desk with just the use of the ridgehand portion of you hand and hold. The corner of the table/desk top will act as a contact point for stress creating purposes. If you like, you can make a fist with your thumbs tucked in. Place the your ridge hand between the table/desk and your knees and use your knees to lift the desk or table. Since the knees are stronger than most peoples biceps, this will normally allow you to increase the duration of your forging exercise.

To strengthen and callus the skin over the hand is your next challenge. Here again, you are limited only by your own creativity. The first thing to come to mind is certainly Makiwara training. Finger tips can be pounded against a table top in piano like fashion to deaden and callus the finger tips themselves. Makiwara boards can be used for knuckles. Wrap some rope around a tree and you have a great Makiwara surface for ridge hands, knife hand, back fists and palm heals. I have also seen the use of hot and cold training technics used for this purpose. Advanced practitioners use contrasting buckets of ice water and boiling water. Plunge the hands in each for as long as you can stand it safely and alternate between the hot and cold elements. The Chinese Iron hand training also uses this principle of heat. By placing sand in a large wok and heating it, the practitioner then plunges his hands into the sand and sifts. I believe it is a Shaolin technics to use buckets of varying size of sand and gravel (unheated) in their hand training. The student plunges his hand, fingers first, into the bucket as far as he can. The object here is to keep the fingers together and get the hand further and further into the bucket. Use your own imagination in creating your own forms of personal torture, just remember to use common sense and patience in progressing.

5.

The foot can be stressed very similarly to the shin. The dowels you use to create a mat can simply be placed farther back while you are in a kneeling position. This will work the tarsals and metatarsals (the top of the foot used in round kicks). Kneeling up on your toes will help the toes themselves and the ball of the foot increase their mass. To increase mass in the knife edge of the foot, simply stand on your mat of dowels or gravel and pronate your foot so you bear your weight over the knife edge and heel.

To callus the foot is also very straight forward. We have already discussed walking barefoot whenever possible. Makiware and bag training will also help. Don't forget to work all parts of the foot and be mindful of any tissue damage. Here I am reminded of a technic made famous by Mas Oyama. Apparently, he used a 10 pound mallet and actually hammers his feet and hands. Obviously, this is a result of years of evolved and progressive training. I would never recommend this sort of training for a novice

Forearm

To stress bone in the forearm is very similar to the shin. You can use your same mat of dowels or gravel bed for this purpose. Assume an abbreviated push-up position with all your weight over your forearms instead of your hands. Do this in increasing amounts of time as long as you can stand. Like the shin, your forearm bone is close to the surface of the skin. Carefully evaluate the tissue damage after each session and proceed with care. Give your body a couple days to recover in that area. Take those couple of days to rotate in other areas you need work on.

To strengthen the surface and callus the skin use Makiwara training. Return to your tree with the rope rapped around it and perform forearm strikes. The forearm is not nearly so sensitive as the shin. Therefore, you should be able to work on the bark of the tree itself in fairly rapid fashion. If you keep firewood at your house, you and a partner can play catch with an individual log - catching underhanded with both arms. The bark will cause some scratches at first, but in no time the top of your forearm will have a healthy layer of callus you can be proud of.

Summary

Having never been to the far east myself, I cannot comment on whether or not this kind of training remains as a vital part of the overall regimen. However, based upon what I have seen at the Sabaki tournament over the years, I assume it is a major part of their workout. To the western way of thinking, it may appear as a rather extreme form of self torture. My own opinion is that Forging should be a vital part of any serious martial arts training. All classes require breaking techniques be demonstrated at tests and I think the chance for injury would be greatly lessened with just a little forging preparation. If Forging is approached in a careful and controlled manner, then there need be no more torture involved than any other aspect of martial arts training. The benefits will speak for themselves.

Master Rankin,

Thank you so much for the opportunity to train in your school. I can't think of anywhere else I would rather be. I think of this upcoming Black belt as just the start of what I hope is a long association with the Mountain Academy. There is an old saying " That which is not given away is lost". Truly, it can be said that you have not lost a thing. You are a most kind and generous teacher.