Pitching Mechanics with Regards to the Left AIC Pattern

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Overview of the Left AIC Pattern

The Left AIC (Anterior Interior Chain) Pattern is a normal pattern for a human being to assume. Due to the underlying asymmetries of the body, specifically the location of the liver on the right side of the body and the anatomical differences between the right and left domes of the diaphragm, humans typically become stuck in this pattern.

This pattern can also be referred to as the right stance phase of gait (walking). With that in mind, it's important to realize that this is a perfectly normal and healthy position to get into. Problems only arise when we are unable to get out of the Left AIC pattern and seamlessly shift into the Right AIC pattern or the Left Stance phase of gait.

When someone gets into right stance (Left AIC Pattern), certain things happen within the musculoskeletal system. Generally speaking, the left hemi-pelvis will be anteriorly tipped and forwardly rotated, and the left ribs will externally rotate and flare up. With this pattern, the lumbar spine will orient itself to the right causing the thorax to pull itself back to the left in order to straighten the body out.

Along with a number of muscular issues that arise from being stuck in the Left AIC Pattern, respiratory issues will also become prevalent. Air will begin to flow much better through the left side of the rib cage as it is externally rotated while the internal rotation of the right rib cage will make airflow far more challenging. In addition, expansion of the left posterior rib cage will be quite limited in comparison to the right posterior rib cage that should see a greater ability to expand during inhalation.

A ton more can be said about the Left AIC pattern but generally-speaking, this is what is going on.

From an athletics standpoint, we need to recognize that most of our athletes will fall under this umbrella. From my experience, 100% of my athletes have been under this umbrella to some degree. With the Left AIC pattern in mind, how can we better manage the training protocols for our athletes and further buffer their ability to prevent injury.

Left vs. Right Adductor

In right stance of gait, our center of mass is shifted over to the right. This is largely accomplished by the right adductor. So, becoming stuck in right stance will prevent the right adductor from inhibiting and it will remain short and strong.

On the flip side, we will have a left adductor that is long and weak and lacking the power to inhibit the right adductor to allow us to shift in the frontal plane back into left stance.

In the past I have had some trouble understanding how this is the frontal plane. Picture the pubic symphysis shifting during gait. When you shift to right stance, the pubic symphysis will shift to the right and down (this shortens the right adductor and lengthens the left) and vice versa to the left. Thus, from a pelvis standpoint, the motion is acting in the frontal plane.

With regards to pitching a baseball, how will this affect the movement?

For right handed pitchers, they will easily stand tall on the mound in right stance, however, cleanly shifting their hips from right stance to the left from left heel strike all the way through their follow through will be challenged by their ability to inhibit their right adductor and facilitate their left.

For left handed pitchers, it will be reversed. As they stand up tall on the rubber in left stance, it won't be as strong but as they begin their motion towards the plate, shifting over into right stance will be very smooth and easy because the right adductor wants to pull you back over. It is my theory that this is why left-handed athletes have a much smoother delivery in many athletic movements.

Training and pre-hab protocols should address this issue. Frequent facilitation of the left adductor in conjunction with right adductor inhibition should be a staple of their training programs. We must give their body the ability to accept left stance.

Understanding injury vulnerabilities changes with this mindset as well. The right adductor will now be far more prone to an eccentric strain while the left adductor will be far more likely to suffer a concentric strain.

For many athletes, achieving neutrality is not a reasonable solution in the short term, so a training program should consider these injury vulnerabilities when training. More concentric left adductor work and eccentric right adductor work may be in order.

Left vs. Right Abdominals

As we continue with more landmark sites to consider for pitchers with respect to the Left AIC pattern, we will see much of the same ideas as we discussed with the adductor groups. The left abdominals are no exception.

The left abdominals have flared and externally rotated because we need to get air in. The major problem with this is that we will lose airflow on the right side, specifically under the right shoulder. This will be like shooting a cannon out of a canoe for an overhead athlete. We need that airflow under the right shoulder in order to stabilize that shoulder.

One of the limitations that we will see in the Left AIC (Right BC pattern as well but we won't get into that here) pattern is limited shoulder Internal Rotation on the right side. Well in pitching, they are going to be aggressively internally rotating no matter what, so you absolutely want to

bulletproof this motion as much as possible making right apical air flow a requirement and the best way to achieve that is through left abdominal facilitation.

If the left abs are on, you force the airflow to be a repositioning force from within. You force their air to the right side.

More specific to the right-handed pitching motion, just like the left adductor, if the left abs do not possess the ability to overcome the right abs (in conjunction with the left adductor), the body will not be able to easily shift over into left stance from transition phase to follow through.

The left-handed motion will again be the opposite. The abs will much more fluidly move into right stance as this is their natural pre-disposition due to the Left AIC pattern.

The left abs will also be more vulnerable to a concentric straight while the right will express greater vulnerability to an eccentric strain. Training programs should accommodate this principle.

Left vs. Right Hamstring

With the anterior tilt of the pelvis in the L. AIC, the left hamstring will become long and weak. For right handed pitchers this can become a major problem. During stride phase of pitching, all the way through the follow through, the left hamstring is going to have a lot of force driven through it. For a hamstring that is not in a good position to work, this is a problem.

Although the left hamstring will be at a greater risk of a concentric strain due to the L. AIC, the right-handed pitching motion is a bit different. It will put a tremendous amount of eccentric strain on the muscle. So, in this case, it is just important for us to realize that our left hamstring is weak and out of position and already eccentrically loaded. Extra eccentric action, especially with the amount of force a pitcher is generating, will be all the more disadvantageous to that left hamstring. Training programs should never be short on hamstring strengthening at all phases of contraction (eccentric, concentric and isometric).

Left-handed pitchers do need to worry as much about the higher risk of concentric left hamstring strain as the push-off phase of pitching will put a tremendous amount of concentric force into the left hamstring.

Foot Action

When reviewing the above material, it becomes apparent that training and prevention will work best when we can use all of this information to attack the L. AIC as a team. We want as many factors contributing to shifting back to left stance as we can possibly acquire. In that light, the feet must be considered as well.

In the Left AIC pattern, we will see a right foot that is supinated and a left that is pronated. This demonstrates the weight shift to the right that this pattern creates. Because of this, the right

arch and the left heel become extremely important landmarks for right-handed pitchers to lock in, so they can shift their weight over to the left.

We want to gain sensory awareness of these reference centers. Sensation of the right arch will neurologically permit weight shift back to the left. Sensation of the left heel will accept that weight shift. This is obviously a big deal for a right-handed pitcher.

Standing tall on their right foot, one of the first moves we would like to see is a right foot that begins to pronate, initiating weight shift to the left (also activating the right glute which is where a ton of a pitcher's power will come from).

For a left-handed pitcher, the feet are likely already in the position we would want. This is not to say that we would not want to re-position them. There are many reasons to proceed with re-positioning, however from a strictly performance standpoint, just appreciate the difference between righties and lefties with regard to the L. AIC.

There are many different approaches to getting these but making an athlete aware of these references during training will always be the first step.

Left Posterior Capsule

The last landmark we will cover in this article is the left posterior capsule. I want this section to illustrate how there are many different angles to look at when considering the best course of action to produce L. AIC inhibition and R. AIC facilitation.

Many of the above attempts to facilitate left stance could prove unsuccessful if the left posterior capsule does not have enough laxity to accept the weight shift.

Because of the anterior tilt and forward rotation of the left pelvis in the L. AIC, the left femur will externally rotate due to compensation. This will make the posterior hip capsule short and tight thus preventing the internal rotation necessary to accept and achieve left stance.

Testing protocols should be installed to determine whether or not this is a limiting factor and training should follow suit.

Conclusion

I hope you now have a greater appreciation for the Left AIC pattern and its influence on pitching mechanics. I hope you also have a better understanding of how lefties and righties will have varying abilities of movement due to this normal human pattern.

The Left AIC pattern is completely normal and in nearly ten years of working with high level athletes, I have never seen someone who did not present with some level of the L. AIC.

There are MANY other factors that can contribute to the inability to shift back to the left as well as MANY other layers that can be added on top of this pattern.

In all of my years working in professional sports, I have been able to get ONE athlete completely neutral. Most of the time, professional trainers are not given all of the resources needed to break through into neutrality. For some athletes the allotted time will be enough, for the great majority it will be nowhere close. Because of this, understanding the pattern that lies beneath will be a great benefit to you as an athletic trainer, physical therapist or strength and conditioning coach.

I often found myself saying that my baseball players swing a bat or throw a ball hundreds of times a day, every single day. This was going to make it extremely challenging to find neutrality in their world. However, thorough testing allowed me to appreciate each individual's underlying pattern to better program for them to accommodate the immense asymmetrical volume that they will be placing on their bodies.

I encourage you to become expert testers in order to better understand your athletes and better program for their INDIVIDUAL needs.