Pose Breakdown 101: Crocodile & the Shoulder Girdle

Specificity of training physically can be a tough task. Many times we hear ” I just don’t have the strength to do crocodile”. Knowing which muscles are in the upper torso and understanding how they work is essential for us as teachers. Being aware which cross training exercises aid in balancing out the body helps us to encourage success within our student’s yoga practice. Our back is our support. A strong upper back is EQUALLY important as a strong lower back. Many times we over task our primary muscles because we lack the strength in secondary muscles. Balancing the body by strengthening weak muscles and stretching tight ones can bring about improved posture and a greater sense of self-projection.

The shoulder girdle (pectoral girdle) is part of the appendicular skeleton. Its bone structure consists of the scapula (shoulder blades) and clavicle (collarbone). The shoulder (glenohumeral) is a ball and socket type of joint with three axis of rotation. Multiplaner range of motion (flexion/extension; abduction/adduction; circumduction; internal/external rotation) allows for peak functional capacity. In fact, the shoulder is considered the most functional joint in the body. In keeping with relation to Crocodile pose, we will be referring to 6 muscles.

TRAPEZIUS-middle and lower
RHOMBOIDS-major and minor
LEVATOR SCAPULAE
PECTORALIS MINOR
SERRATUS ANTERIOR
TRICEP BRACHII-long head

Anatomical and physiological factors influence the direction of movement muscle fibers create. Most muscles are penniform; designed for higher force production and lie diagonally to the line of pull (defined as a straight line between the two points of muscle attachment). The trapezius lies close to the posterior surface of the upper body. The middle trapezius allows for scapula adduction (movement of the scapula bone towards the spine), while the lower trapezius encourages scapula depression. Underneath the trapezius we find the rhomboids and serratus anterior. The rhomboid muscles attach (insertion) diagonally to the medial edge of the scapula, while it’s origin lies on the seventh cervical through the fifth thoracic vertebrae. The serratus anterior lies on the right and left lateral side of the body. It attaches in the same manner as the rhomboids, but its origin is on the rib cage. The rhomboids aid scapular adduction and stabilization is encouraged by the serratus anterior. Without this stabilization, we would see the bottom point of the scapula winging out.

We can suggest working with a modified crocodile pose for beginners to experience these muscles working. The lowering from modified plank on the exhalation contracts the middle/lower trapezius and rhomboids. This in essence is a pulling motion. When cross training in the gym, trainers can suggest these exercises. For beginners, the locust pose is a great starting option. It isolates the specific muscles in the middle posterior trunk. Also wall push-ups are another option because they work the serratus anterior for increased stabilization. As strength increases, working with the seated row with chest support is ideal. Choose an appropriate weight (one that will allow 8-10 reps) as well a close grip option (elbows along side the ribs). Most people have the greatest strength on the pull, but because we are trying to mimic the action against gravity, work slowly with a controlled range of motion (5-8 sec count). The second option is to lie prone on an inclined bench face down, working with medium weight dumbbells. Begin with elbows bent, hugging closely to the sides of the body the arms, wrist facing down, and pull the shoulder blades together. This exercise truly isolates the middle trapezius and rhomboids.

The levator scapulae and pectoralis minor play an important role in shoulder depression. The pectoralis minor, an anterior muscle, inserts on the coracoid process, close to the acromion of the scapula. While this muscle is not a moving factor during crocodile pose, it can add to shoulder elevation if the muscle is tight. The levator scapulae also contribute to shoulder elevation. We find its origin on the upper fourth and fifth cervical vertebrae and it inserts on the vertical border of the scapula. Try this exercise. Extend your arms, with starfish hands in front of you, as if to mimic a push-up. Without changing the position of your hands, draw your elbows inward towards the sides of the body. Notice how your shoulders feel. Scrunched? This action is hard to do because the levator scapula automatically activates to drop the shoulders. The dropping of the shoulders is what we want to happen during this movement.

Recommending exercises to stretch these muscles will decrease tension within the shoulder and lessen the burdensome feeling of stress. Standing chest expansion is a great chest opener. Also try this simple twist to stretch the shoulder. Begin in easy-seated position (or seated on a cushioned chair). Place the right hand behind for support, creating a second spine. Place left hand on right knee. Inhale to lengthen spine, exhale and twist, rotating right shoulder away from right knee. Rather than turning and looking in the direction of the twist, look in opposite direction (over left shoulder). Slightly drop your chin,

gazing towards the floor. Switch sides. Seated in same position, place your hands underneath your seat, tilt head down, inhale lift heart, and exhale slide your shoulders down. Imagine someone standing behind you, pressing their hands down onto your shoulders.

We discussed all the major muscles of the upper trunk needed to perform crocodile, except for the triceps. Triceps strength is needed to lower from plank to crocodile pose. Understanding their placement and range of motion will help us in properly engaging the muscles. The long head of the triceps originates on the posterior edge of the glenoid cavity. It inserts at the olecranon process of the ulna (longer of the forearm bone). The triceps main function is extension at the elbow joint. When performing crocodile, students are flexing at the elbow joint, which is a lengthening (eccentric) action of the triceps. Most of us train the triceps to have power on the concentric action; ex: triceps kick backs, unilateral overhead extensions. Eccentric (negative) contractions require greater strength application, even more so that isometric. Slow training (10 sec count), whether with or without weights, can assist in increasing the power during the eccentric phase. Triceps dips are a basic exercise to improve control and muscle strength.

Along with training the physical body, we can also train our mind. I believe the phrase goes" Mind over matter". Telling our self we have the power within to support our bodies as we go through plank to crocodile is a way of reinforcing the mind/body connection. Patterns occur within the mental/emotional capacity before they come forth physically. Positive affirmations and optimistic thought processes will build stronger bones and strengthen any structure that gives us support.

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References: ACE Personal Trainer Manual, Second edition, Copyright"1996
Chapter 2; Human Anatomy, Chapter 3; Biomechanics and Applied Kinesiology, Chapter 8; Muscular Strength and Endurance.

Anatomy of Hatha Yoga, David Coulter,Copyright" 2001
Chapter 8/ Pgs. 455-458, 460-465

Yoga For Wellness, Gary Kraftsow,Copyright"1999
Chapter 3/Pgs. 142-144

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Anatomy of a Yogi/ Shouldering Responsibility