

Anatomical Exploration of "Makarasana"

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ABSTRACT

The word *Yoga* comes from the Sanskrit word *Yuj* meaning to yoke, join or unite. It implies joining or integrating all aspects of the individual body with mind, and mind with soul to achieve a balanced and healthy life. *Yoga* is performed through some specific postures called *Asana*. Among the eight limbs of *Yoga*, the *Yogic* technique properly begins at the third limb that is the *Asana*. *Asana* means a state in which one can remain physically and mentally steady, calm, quiet and comfortable. Patanjali defines *Asana* as 'Sthirasukhatvam' in *Yogasutra* which can be translated as Stable and pleasurable state of body is called *Asana*. "Makarasana" was described as one of the 32 most important *Asana* in *GherandaSamhita*. The word *Makarasana* is formed from two words first *Makar* means crocodile and the second *Asana* means posture. The posture is called *Makarasana* because in this pose the body seems as a crocodile taking rest in water keeping its neck and face above the surface of water. In this article anatomical structures involved in the "Makarasana" and how this involvement is beneficial in maintaining the health or in management of any disease is explained.

KEYWORDS: *Yoga, Asana, Anatomy, Joint, Muscle, Makarasana*

INTRODUCTION

"Makarasana" was described as one of the 32 important *Asana* in *GherandaSamhita* (dated 1650 CE). The *GherandaSamhita* is the most encyclopaedic of the three-classic text about *Asana*. It says that there are 8,400,000 of *Asana* described by *Shiva*. The postures are many in number as there are number of species of living creatures in this universe, among them 84 are the best and among these 84, 32 have been found useful for mankind in this world these 32 *Asana* are mentioned in *GherandaSamhita*.¹

The word *Makarasana* is formed from two words first *Makar* means crocodile and the second *Asana* means posture. The posture is called *Makarasana* because in this pose the body seems as a crocodile taking rest in water keeping its neck and face above the surface of water.²

Purpose of this study-

In this article the essential quest of *Asana* practitioner about the anatomical structures involved in the *Asana* and how this involvement is beneficial in maintaining health or in management of any disease and the knowledge of anatomy will also help the *Asana* practitioners, to avoid injuries.

Aim and Objectives -

- To explore the anatomical structures involved in "Makarasana."
- To avoid possibilities of injuries while performing *Makarasana* by understanding the anatomical structures involved in "Makarasana".

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Material and Methods -

1. Texts related to *Yoga-Asana* and their commentaries.
2. Other print media, online information, journals, magazines etc.

Review-

According to *Gheranda Samhita*-

One should lie on the ground facing downwards, the chest touching the earth, the two legs being stretched, catch the head with the two arms. This pose is called *Makarasana*. It increases the heat of the body.³

According to other texts-

According to *Swami Vyas dev ji*, lie down on the stomach, stretch the legs backwards. Placing the hands at your sides with palms resting on the ground, near the shoulders and elbows raised. Now balance the body on the palms and toes and jump about on the toes and palms like a lizard or move about on the toes and palms bringing them forward in order. Take care that the body remains balanced only on the toes and palms and stiff like a wooden plank.⁴

B. K. S Iyengar describe *Makarasana*, lie on the ground face down, the chest touching the earth and both legs stretched out, catch the head with the arms. This is the Crocodile Posture which increases bodily heat. It is a variation of *Shalabhasana*.⁵

Dhirendra Brahmachari explains *Makarasana* as, lie on the ground face downward and with the arms stretched forward.⁶

Steps for performing Makarasana⁷-

- Lie flat on the ground on the stomach in prone position.
- Raise the head and both the shoulders.
- Fold the arms in the front and place the right arm above the left arm keeping the elbows pointing.
- Keep the left palm down on the ground and the right palm on the left arm, the fingers touching the inside of the elbow.
- Put the head down on the center point where the right wrist is above the left wrist.
- Then close both the eyes and relax the whole mind and body.
- After sometime open the eyes and slowly release the posture.

Image-



Anatomical exploration of "Makarasana"-

Joint actions

- The spine is extended
- The ankles are plantarflexed.
- The knees are extended.
- The hips are extended, internally rotated and adducted.
- The shoulder joint is internally rotated.
- The elbows are flexed.
- The forearms are pronated.

The Spine

Similarly, to *Bhujangasana* and *Dhanurasana* in *Makarasana* also the spine is completely extended. All extensors of the back along with external oblique and transverse abdominus are contracted in *Makarasana*. These include the erector spinae muscles, transvers spinalis muscles, quadratus lumborum and Levator costarum.

The thoracic and lumbar spines are in extension. The muscles of anterior abdominal wall help in the Extension of trunk. These includes rectus abdominus, external oblique abdominus and internal oblique abdominus.

Cervical region

Cervical spine is extended. In this position the extensors of cervical region are contracted. Trapezius, splenius capitis, splenius cervicis, semispinalis capitis and longissimus Capitis helps to extend the head and are contracted in this case. The suboccipital muscles are Rectus capitis posterior major, Rectus capitis posterior minor, Obliquus capitis inferior and Obliquus capitis superior are involved in extension of the head at the Atlanto-occipital joints and

rotation of the head and atlas on the axis. These are also stretched in this *Asana*.

Thoracic spine

It is extended. The superior thoracic vertebrae glide inferior and posterior. Iliocostalis thoracis, Longissimus thoracis, Spinalis thoracis, Multifidus, Semispinalis thoracis are active contracted in *Makarasana*.

Lumbar spine

It is extended. Extrinsic back muscles, in the superficial layers Latissimus Dorsi, Levator Scapulae, Rhomboids, trapezius contracts while extension of the lumbar region. Intrinsic muscles help in extension of lumbar spine, Iliocostalis, Longissimus, Spinalis, Semispinalis contracts while performing the *Makarasana*. Anterior abdominal wall muscles stretched in *Makarasana*.

Ankle and foot region

Ankles are plantar flexed and foot is inverted. Muscles which produces the ankle plantar flexion are gastrocnemius, soleus and it is assisted by the Plantaris, tibialis posterior, flexor hallucis longus and flexor digitorum longus. Feet are inverted by tibialis anterior and posterior. The muscles stretched passively are muscles of anterior and lateral compartment of leg and dorsum of foot. Anterior compartment of leg comprises of extensor digitorum longus, extensor hallucis longus, tibialis anterior and peroneus.

Knee region

Knee joints are extended. Muscles which works on knee extension are quadriceps femoris (four heads-vastus lateralis, vastus medialis, vastus intermedialis and biceps femoris). And it is assisted by tensor fasciae latae and articularis genu. The Flexor compartment or posterior compartment of thigh is stretched when the knee is extended. This comprises of the hamstring muscles which crosses the knee and hip joints. This hamstring group of muscles comprises of Semitendinosus, semimembranosus and biceps femoris. To sustain the extended position of the knees the extensors of knee are in active contraction. The quadriceps femoris muscle as a whole keep the knees extended. These include rectus femoris, vastus medialis, intermedialis and lateralis.

Hip region

Hip joints are extended, internally rotated and adducted at the time of performing *Makarasana*. The main muscles worked in the hip extension are the gluteus maximus and hamstrings. The other hip extensors are long head of biceps femoris, semimembranosus, semitendinosus and posterior adductor magnus. So, the flexor of the hip joint will get stretch. Adduction is performed by the adductors of the hip joint which are three groups of adductors, pectineus and gracilis. The adductors also internally rotate the hip joint along with tensor fasciae latae, gluteus Medius (anterior fibres) and some anterior fibres of gluteus minimus.

Shoulder region

Shoulder joint is extended, adducted and internally rotated in the pose of *Makarasana*. The Extension of shoulder joint is caused by Posterior fibres of deltoid, Latissimus dorsi and assisted by the Teres major, Long head of triceps, Sternocostal head of the pectoralis major. The muscles acting as antagonists for this action are clavicular head of pectoralis

major, anterior fibres of deltoid, coracobrachialis and short head of biceps. They are stretched when the shoulder joint is extended. Adduction of shoulder joint is principally done by the Pectoralis major, Latissimus dorsi, Short head of biceps, Long head of triceps, and it is assisted by coracobrachialis and teres major which is antagonised by deltoid and supraspinatus. Medial rotation of shoulder joint is done by the pectoralis major, anterior fibres of deltoid, latissimus dorsi, teres major and subscapularis. The muscles acting as antagonists for this action are infraspinatus, teres minor and posterior fibres of deltoid. Pectoralis minor muscle helps in depression and anterior tilt of scapula and is stretched by the posterior pull of scapula. Deltoid muscle has large range of action on shoulder joint. It helps in the abduction of shoulder joint, the anterior fibers in flexion and posterior fibres in external rotation. Supraspinatus along with deltoid helps in abduction of shoulder joint. Infraspinatus and teres minor are external rotators along with the posterior fibers of deltoid.

Elbow region

Elbows are flexed and forearm is pronated. Flexion of the elbow joint is done by the brachialis, biceps brachii, and brachioradialis. Pronation of forearm is done by the pronator teres and pronator quadratus.

Benefits of "Makarasana"-

This *Asana* is very effective in people suffering from slipped disc, sciatica, and some types of lower back pain. They should remain in this *Asana* for prolonged periods of time as it encourages the vertebral column to resume its normal shape and releases compression of the spinal nerves. Asthmatics and persons having any other lung diseases should practice this simple *Asana* regularly with breath awareness as it enables more air to enter the lungs.⁸

The whole body is exercised, perspired and fatigued. Circulation of blood quickens and it is thus purified. It strengthens especially arms, fingers and legs.⁹

This *Asana* helps in removing fatigue and is useful for the abdomen as well. Persons with irregular and bent bodies should practice it. The *Asana* generates subtle energies inside the body and furnish the body firm and strong like that of a crocodile. Long practice slows down respiration, an achievement of great importance to the *Yogi*.¹⁰

Discussion-

The basic joint positions in *Makarasana* are the spine is extended, ankles are plantarflexed, knees are extended, hips are extended, internal rotated and adducted, shoulder joint

is internally rotated, elbows are flexed and forearms are pronated. The most important benefit of practicing this *Asana* is contraction of the muscles around the sacrum. It supports the spine, stimulate the sacrum and improves *Prana* flow through the entire spine and removed all blockage. In *Makarasana* the entire muscular system of the body is relaxed, it gives a sense of control over the body and mind. with the flow of blood throughout the body with the relaxed muscles, the demand of oxygen is reduced. it helps to relax the circulatory and respiratory system and brings calmness with the slowing of the heart pumping.

Conclusion-

In *Makarasana*, muscles of the sacrum and hip region are stretched. *Makarasana* gives deep relaxation to the shoulder and spine. This *Asana* is very helpful for persons suffering from slipped disc, sciatica, and certain types of lower back pain. It is a relaxing *Asana* and generally practiced after practicing other *Asana* because it releases the stress caused by practicing other *Yoga Asana*.

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- [3] अध्यास्यः शोते हृदयनिधाय भूमौ च पादौ च प्रसार्य मादौ शिरश्च प्रत्वा करदण्डयुग्मे देहाग्निं कारं मकरासनं ततः॥ (वे. सं२/४०)
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